# Preference for delay of shock as a function of its intensity and probability[1]

**ROBERT D. HARE**
*UNIVERSITY OF BRITISH COLUMBIA*

*Ss were given 30 trials on which they were required to choose between receiving shock after 0, 2, 5, 10 or 15 sec. The shock ranged in intensity from a very low level on the first trial to one that was very unpleasant on the 30th. Eleven Ss chose immediate shocks almost exclusively throughout the experiment. The choices of the remaining 9 Ss were scattered, but as shock level increased, there was a tendency to shift towards 0 and 2 sec. delays. There were no significant differences in the choice behavior of Ss shocked on every trial and those shocked on only 50% of the trials.*

Several recent studies indicate that normal Ss prefer an immediate shock to one that is delayed (Cook & Barnes, 1964; Hare, 1966) or randomly delayed (D'Amato & Gumenik, 1960). In addition to the possibility that certain personality variables (e.g., psychopathy; see Hare, 1966) are involved in choice behavior of this sort, it seems likely that the intensity of shock used and the probability of its occurrence would be of some importance. Concerning intensity of shock, Cook & Barnes (1964) reported that a high-shock group chose immediate shock more often than did a low-shock group. However, no tests of statistical significance were reported. Moreover, the shock levels used by these authors were those found "...by a pilot study to yield significantly (.05 level) different mean GSR readings," a procedure which tells us little about where these shock levels fall on a dimension of unpleasantness or subjective intensity. It is still possible, nevertheless, that a strong shock increases preference for immediate shock. It has been suggested for example (Hare, 1966) that a delayed shock is more aversive than an immediate one because it is accompanied by the arousal of fear in the interval prior to its onset. Presumably, the relative importance of this aroused fear in determining preference for immediate versus delayed shock would become greater as the intensity of shock increases from very low to very high levels.

It is more difficult to predict the effect that the probability of shock occurrence would have upon the choice of delay of shock. On a common-sense level, the uncertainty (and perhaps fear-arousal) associated with shock delivered on a probabalistic basis should increase preference for immediate shock. That is, waiting to find out whether or not shock will be received is likely to be more fear-inducing than finding out immediately, an effect that would probably become greater as shock intensity increased.

## Method

The S sat before a sloping plywood panel upon which were mounted five spring-loaded levers, each 2 in. apart. Above each lever was a label indicating the delay of shock (0, 2, 5, 10 and 15 sec. respectively, running from left to right) associated with that particular lever. The S was told that each time he heard a buzzer sound he was to press one of the levers and as a result he would receive a shock after the delay associated with the lever. The shock, 500 msec. in duration, was generated by a Psychological Instruments Stimulator and delivered through electrodes attached to the index and middle fingers of the left hand. The intensity of shock ranged, in 29 approximately equal steps, from a level that was just above threshold on the first trial to a level that most Ss found very unpleasant on the 30th trial. The S was told that the shock would gradually become stronger throughout the experiment and also that no matter what levers he pressed the length of the experiment would be the same. The interval between trials was 30 sec. Response-latencies were measured with an electric stop clock.

The Ss were 20 undergraduate students with a mean age of 20.5 (range from 18 to 24). One group of Ss (E-100) received shock on every trial, while the other group (E-50) received shock on only 50% of the trials, with the pattern of shocks being determined randomly. For the latter group, the shock intensity increased on every trial (as it did for E-100) regardless of whether S had actually received a shock on the preceding trial or trials. There were 11 Ss in group E-100 (six males and five females) and nine Ss in group E-50 (five males and four females). Ss in both groups were fully informed beforehand of the conditions under which shock was to be administered.

## Results and Discussion

Table 1 contains the percentage of times each delay of shock was chosen by groups E-100 and E-50 during successive blocks of five trials each.[2] Since the shock became stronger on each trial, the figures for each of the six blocks of trials may be taken to represent the pattern of choices made as a function of increasing shock intensity. Perhaps the most striking thing about Table 1 is the marked preference for immediate shock shown by both groups, a preference that was generally evident during all stages of the experiment. As a matter of fact, during the first five trials (when shock was very mild), five Ss in group E-100 and four Ss in group E-50 chose the 0 sec. delay shock every time, while one S in each group chose it four times. Thus, 11 out of the 20 Ss showed an almost complete preference for immediate shock even when its intensity was so low that it produced little more than a mild tingling sensation. This preference held up throughout the remainder of

Table 1. Percentage of times each delay of shock was chosen by groups E-100 and E-50

| | E - 100 | | | | | E - 50 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Trials | 0 | 2 | 5 | 10 | 15 | 0 | 2 | 5 | 10 | 15 |
| 1-5 | 63.6 | 10.9 | 18.2 | 3.6 | 3.6 | 68.9 | 15.6 | 2.2 | 0 | 13.3 |
| 6-10 | 63.6 | 14.5 | 14.5 | 0 | 7.3 | 57.8 | 15.6 | 11.1 | 8.9 | 6.7 |
| 11-15 | 69.1 | 12.7 | 9.1 | 3.6 | 5.5 | 51.1 | 24.4 | 6.7 | 4.4 | 13.3 |
| 16-20 | 74.5 | 16.4 | 3.6 | 1.8 | 3.6 | 64.4 | 8.9 | 13.3 | 4.4 | 11.1 |
| 26-30 | 74.5 | 20.0 | 3.6 | 0 | 1.8 | 64.4 | 26.7 | 4.4 | 0 | 4.4 |
| Total | 70.3 | 14.8 | 9.1 | 1.8 | 3.9 | 60.7 | 17.8 | 8.1 | 3.7 | 9.6 |

the experiment, except for one S who shifted three of his responses to the 2 sec. delay lever on the sixth block. It would appear that waiting for even a mild shock to occur is aversive, perhaps because of generalization from past experiences with shock and because of the connotations that the concept of shock has for many people.

The consistent preference for immediate shock snown by these 11 Ss probably accounts for the fact that neither group E-100 nor group E-50 exhibited any significant changes in preference as the shock increased in intensity. Before concluding that intensity of shock had no effect upon choice of delay however, it is relevant to note that of the nine Ss (five in E-100 and four in E-50) whose choices were scattered among several delays, seven (four in E-100 and three in E-50) showed a marked tendency to shift their choices to the 0 and 2 sec. delay levers towards the end of the experiment, while the remaining two showed no appreciable change ($p = .09$, one-tailed sign test). It is interesting to note that three of these Ss shifted to the 2 sec. delay rather than the 0 delay since the former gave them a chance to "get set" for the shock.

Contrary to expectation, presentation of shock on only 50% of the trials did not increase the preference for immediate shock. Actually, the trend was in the opposite direction, though the difference in choices made by the E-100 and E-50 groups did not reach significance. Further research involving a wider range of probabilities would appear to be necessary.

In the Cook & Barnes (1964) study, as well as an earlier one by the author (Hare, 1966), response latencies remained relatively constant throughout the experiment. However, both studies employed only six trials. In the present study, which used 30 trials, there was a significant decrease in response latency from the first to the last block of trials ($p < .05$ by sign test). Post-experimental discussions with the Ss suggested that as the experiment progressed, many of them made a decision during the intertrial interval about the choice they would make on the next trial. Thus, the response latencies during the early trials probably contained more of a decision-time component than did those during the later trials. An additional possibility is that short response latencies are consistent with a preference for immediate shock, i.e., both may reflect a general tendency to "get it over with" as soon as possible. The tendency of some Ss to shift to 0 and 2 sec. delays towards the end of the experiment would thus contribute to an overall lowering of response latencies. To test this "short latency-preference for immediate shock" hypothesis, the latencies of the 11 Ss who chose immediate shock almost exclusively were compared with those of the nine Ss whose choices included few immediate shocks. While the latencies of the former were shorter, a Mann-Whitney U test revealed that the difference only approached significance ($p < .10$). Of the seven Ss whose choices shifted to the 0 and 2 sec. delays, the latencies of five decreased from the first to the last block of trials, while those of two increased, a nonsignificant difference.

## References


**Cook, J. O., & Barnes, L. W.** Choice of delay of inevitable shock. *J. abnorm. soc. Psychol.*, 1964, 68, 669-672.

**D'Amato, M. R., & Gumenik, W. E.** Some effects of immediate versus randomly delayed shock on an instrumental response and cognitive processes. *J. abnorm. soc. Psychol.*, 1960, 60, 64-67.

**Hare, R. D.** Psychopathy and choice of immediate versus delayed punishment. *J. abnorm. Psychol.*, 1966, 71, 25-29.


## Notes


1. This research was supported by Grant APA-139 from the National Research Council of Canada. Appreciation is extended to T. Creighton and D. Krebs who ran the Ss, and to W. Petrusic and B. Tindall for their helpful comments.


2. None of the differences was related to the sex of Ss.