The effects of calling "right" and "wrong" on neighboring response

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Each of 393 undergraduates was given four readings of a list of letters and required to call out a digit for each letter. Response to the fifth of the nine letters of the list was fixed by instruction of S in order to eliminate differential effects of guessing habit under conditions in which E called "right," "wrong," or remained silent when S called the response fixed by instruction. The frequency of repetition was decreased for "wrong" relative to both "right" and silence for responses preceding but not for responses following the fifth letter, giving a significant interaction ($p < .02$).

As is well known, evidence in support of Thorndike's doctrine of automatic spread of effect has been effectively criticized. The results of Zirkle (1946a, b), Jenkins & Sheffield (1946) and Sheffield & Jenkins (1952) indicate that at least some of the change in repetition rate for responses neighboring reward and punishment may result from guessing habit gradients generated differentially by direct or isolation effects of calling "right" or "wrong." The present experiment is an attempt to control these and other variables for the case in which response to only one stimulus item is called "right" or "wrong."

Ideally, one might wish to have an equally isolated stimulus of neutral aftereffects as a baseline for measuring any effects of calling "wrong" or "right." Unfortunately, it is difficult to specify such a stimulus. Silence qualifies as a condition of neutral aftereffect but lacks any possible spread of isolation effect. Because isolation probably has little effect on responses immediately preceding isolated stimuli (Zirkle, 1946b) silence is included as a condition in the present experiment but results with the silence condition are excluded from the statistical analysis in order to avoid confounding of differences from aftereffect and isolation effect.

Subjects. A total of 393 students from undergraduate classes at Brockport served as Ss. The great majority were students of introductory psychology classes fulfilling course requirement by serving as Ss.

Materials. The letters F, H, K, L, P, R, T, X and Z were used as stimuli. Their order was randomly determined for each of 131 triads of the vocal treatments ("right," "wrong," and silence). Within a triad the order of letters

was identical. Each condition of a triad was given to a new S, and the conditions of a triad were exhausted before moving to the next triad. The order of treatment within each triad was randomly determined. For each triad a digit was randomly selected and this digit was used for each treatment as the response S must make to the fifth letter of the list of stimuli.

Procedure. Subjects were seated at a table with E facing their side from a distance of approximately 3.5 ft. The E then read the following instructions, inserting the fifth letter of the list and its associated digit as appropriate: "In the following experiment whenever I say a letter you are immediately to say a digit, 0 through 9. Do not say the digits according to some special prearranged plan you might think up. For example, do not plan in advance to say the same digit every time. Instead, select digits as they naturally occur to you when you hear the letter. The digits of course are 0, 1, 2, 3, and so on through 9 and you are to pick one of these 10 digits and say it for each letter I say. Do you understand so far? Now there is one final special instruction. When I say the letter ___ you must say the digit ___. Do you understand? For what letter must you always say ___? That's correct. You may say whatever number occurs to you when I say other letters but you must say ___ when I say ___. Now we will begin. The first letter is. . ."

The list of letters was then read aloud four times by E who recorded S's response to each letter and spoke "right," "wrong," or remained silent each time S responded to the fifth letter of the list. Occasionally an S forgot to give the required response to the fifth letter and was prompted to do so.

Results and Discussion. The number of repetitions (R) of a digit made by a given S for each position of the list was defined in advance of pilot study as

$$R = \frac{m}{\sum(n-1)} \quad (1)$$

where n is the number of occurrences of a particular digit for each of the m different digits given by S at a position.

Results with Equation 1 are shown as Fig. 1. For each S repetitions were summed over responses preceding the fifth position and over responses following the fifth position. An analysis of variance was then performed over the right-wrong dimension and over the preceding-following dimension. This yielded a significant interaction ($F = 5.67$, $df = 1/262$, $p < .02$). The main effect of right-wrong did not attain significance ($F = 1.41$, $df = 1/262$, $.20 < p < .25$), but there was a significant main effect of preceding-following ($F = 5.49$, $df = 1/262$, $p < .03$).

The number of times the response fixed by instruction for position five occurred in position six was tallied. Such occurrences were rare, 11 times each under the "silence" and "right" conditions and only five times under the "wrong" condition. One might expect that if E's call of "wrong" confused S as to which letter he was to respond with the fixed response the digit of the fixed response would have occurred most under the "wrong" condition for position six and the obtained interaction cannot therefore be attributed to cognitive confusion.

The obtained significant interaction indicated that the differential effect of E calling "right" and calling "wrong" on repetition of neighboring responses changes as a function of the temporal relation of the neighboring response and the call. Unlike studies in the Thorndikian tradition, the trend of the present results indicates a differential influence of the call primarily on responses preceding the fifth position. If anything, the greater repetition for the "wrong" condition at position six suggests an after gradient spread of "relief" rather than punishment. Whether the obtained effect should be considered automatic or cognitive is difficult to say, particularly in view of the failure of an obvious foregradient to appear in the data, but there is no apparent reason to suspect that the effect was cognitive. The obtained effect for preceding repetitions and the similarity of the curves for the silence and "right" treatments suggest that the effect is simply related to forward, as opposed to backward, counter conditioning, an adaptive response.

Of course the failure to find an indication of an effect of "right" and the apparent primary effect on preceding responses

Fig. 1. Percentage of repetition (R) for each aftereffect condition as a function of position in the list of the stimulus.

may be a result of the unusual conditions of the present study. Since the instructions eliminated the possibility of detecting a direct effect of "right" it might be argued the procedure does not provide a powerful test for spread of effect of "right."

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