

DISCUSSION

THE STIMULUS ERROR, A REPLY

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Professor Weiss¹ objects to a conclusion to an experimental study of mine to the effect that "this experiment seems to show the futility of properly interpreting the statistical results of a purely behavioristic study without the control of the introspective report."² The study in question was the determination of the difference limen to lifted weights under the three different instructions to judge: (1) the weights (stimulus error); (2) pressure sensations and (3) kinæsthetic sensations in the wrist. Statistically these different instructions gave relatively different values for the difference thresholds.

It is claimed that these experiments are not purely behavioristic because no attempt was made 'to establish laws according to which weight discriminations are made by some social or anthropological unit.' It is unfortunate, perhaps, but in an experiment of this sort one seems to be limited to the use of the graduate student and the recent Ph.D. as one's 'anthropological unit' and, frankly, I find them more interesting as a unit than '. . . post-office clerks, store-keepers, housewives, etc.,' and much more readily obtainable about a psychological laboratory. It has always seemed to me that one, in reading an experimental paper, considered the experimental setting,—Watson (to whom one usually turns in considering Behaviorism) insists upon it.³ Our 'stimulus error' setting is as exact as we could devise from the method suggested and implied by Watson (pp. 37) when he speaks of "asking the subject as we do in the verbal report method: *Is this light brighter or dimmer than another light, or, Is this tone lower or higher than that tone?*" (italics Watson's) and in his further discussion of the stimulus and difference thresholds (p. 52).

¹ Weiss, A. P., 'The Stimulus Error,' J. OF EXPER. PSYCHOL., 1922, 5, 223-226.

² Fernberger, S. W., 'An Experimental Study of the "Stimulus Error,"' J. OF EXPER. PSYCHOL., 1921, 4, 63-76.

³ Watson, J. B., 'Psychology,' 1919, p. 28.

Unfortunately we have found elsewhere that different individuals react differently under such instructions as well as the same individual at different times, so that they will give rather large differences in threshold values. It has been shown that these differences are not due to changes in the experimental setting or in the sense organs themselves but are due to differences in the attitude of the subject—if by that we are agreed to mean the manner in which the subject accepts and understands the instructions.¹ It would seem, therefore, that a study of the way a subject accepts the instructions and the differences in reaction due to the differences in attitude thus created would be a proper form of behavioristic research.

It may be the ideal that any subject, animal or human—‘scientist, post-office clerk, store-keeper, housewife’ or even a poor graduate student—would have aroused, always and invariably, the attitude which the experimenter meant to imply by the instructions. But, unfortunately, one cannot be sure that this is the case and so one has to use various experimental controls to be sure that he has obtained the desired result. Unfortunately, I am not aware of any experimental control of attitude or thinking or ‘implicit sub-vocal response’ other than by introspection, in the present state of our knowledge at least. I should be glad to learn of some other method less laborious and less tedious and more ‘objective’ than systematic experimental introspection for determining whether a subject is now judging pressure on the finger tips and now kinæsthetic sensations in the wrists *when you told him to judge the weights*.

Weiss insists that introspection ‘as an end result is hopelessly inadequate to reveal the inheritance factors, the environmental factors and the training factors, which are the causes of a given set of reactions.’ I am quite in accord with him in this statement. I certainly realize the limitations of the introspective method and its inadequacy in all but its own sort of problem. But objective methods and introspective methods may be used and should be used to complement one another wherever possible—if for nothing more than as an experimental control. And it turns out in an

¹ Fernberger, S. W., ‘An Introspective Analysis of the Process of Comparing,’ *Psychol. Mono.*, Whole No. 117, 1919.

Fernberger, S. W., ‘The Effect of the Attitude of the Subject upon the Measure of Sensitivity,’ *Amer. J. of Psychol.*, 1914, 25, 538–543.

George, S. S., ‘Attitude in Relation to the Psychophysical Judgment,’ *Amer. J. of Psychol.*, 1917, 28, 1–37.

experiment, such as the determination of the difference limen to lifted weights in the anthropological unit of the post-graduate student in psychology at Clark University in the year 1921, that such an introspective control of the way the subjects interpreted the instructions proved to be necessary. And, from other work, we believe that it is necessary when dealing with other anthropological units.

Weiss does not criticize the experimental results of this study but merely the implications which have been drawn from them. The experiment was devised to study the effects of attitude on the psychometric functions. It was found that attitude had an effect in graduate students. If such an effect is present in graduate students, trained in scientific method, it is reasonable to speculate further that attitude will be much more likely to have an effect as one changes from the housewife to the post-office clerk, because these non-laboratory types are less amenable to constancy of reaction.

Weiss also insists that introspections 'are abnormal supplementary speech reactions of the same nature as illusions, dreams, etc.' If by abnormal, he means unusual in that they occur in a few individuals who have been specially trained, I would agree. But it would also seem to me that any scientific observation whatsoever or any scientist must be similarly abnormal. But I hope that his inclusion of introspections with 'illusions, dreams, etc.' is a verbal slip and is not to be taken literally.