

biguous). Rather, the PSE is derived directly from the psychometric function (see Bock & Jones, 1968, pp. 30-33). A summary of performance for comparisons involving identical pairs is provided later in the Results section under the heading "Presentation-Order Analyses."

5. In 6 of 120 instances, subjects displayed near-zero or slightly negative slopes to their psychometric functions (i.e., no discriminative sensitivity). All 6 were for comparisons with remembered standards, and 5 of the 6 instances occurred with the middle standard, again illustrating the reduced discriminability for that standard. Importantly, when the slope of the psychometric function is near zero or negative, PSEs, JNDs, and Weber fractions cannot be computed. For this reason, the statistical test for discriminative sensitivity was conducted directly on the slopes of the individual-subject psychometric functions. This analysis is appropriate because the JND and Weber fraction depend directly on the slope of the psychometric function.

Let  $z = a + bx_1$  denote the  $z$  score psychometric function, where  $a$  is the intercept,  $b$  is the slope, and  $x_1$  is the effect-coded variable stimulus (-2, -1, 0, 1, 2). Let  $x_2 = S(1 + cx_1)$  be a linear transformation equation relating the effect-coded equation to one representing the phys-

ical stimulus values, where  $S$  is the standard and  $c$  is a conversion constant ( $c = .03$  in the present case). Since  $x_1 = (x_2 - S)/Sc$ , it can be shown that the upper limen (UL) =  $Sc/b(.675 - a + b/c)$  and that the lower limen (LL) =  $Sc/b(-.675 - a + b/c)$ . Since  $JND = (UL - LL)/2$ , it follows that  $JND = (.675)(S)(c)/b$  and the Weber fraction =  $(.675)(c)/b$ . Thus, the Weber fraction is inversely related to the slope, and constancy of slopes is required for the strong form of Weber's law to hold.

Finally, when calculating individual-subject  $z$  score psychometric functions, we corrected probabilities equal to 0 and 1.0 according to Berkson (1953), whose method is recommended by Bock and Jones (1968, p. 21).

6. Both here and in the first experiment, TOE direction was consistent over the two instructions (longer, shorter). This replicates previous research in the context of duration discrimination (Jamieson & Petrusic, 1975a, 1975c; Petrusic, 1984) and confirms that TOEs are not a result of peripheral response biases; otherwise the TOE would reverse with instructions.

(Manuscript received November 13, 1989;  
revision accepted for publication September 23, 1991.)

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