the ratio of the largest to the smallest range is computed. The transformation that produces the smallest ratio is selected as the most appropriate one. This procedure is illustrated in Table 2.7-2 for the data in Table 2.7-1. On the basis of this procedure, a square-root formation would be selected for these data.

Once an appropriate transformation is selected and the data analyzed on the new scale, all inferences regarding treatment effects must be made with respect to the new scale. In most behavioral research situations, inferences based on log X's or $\sqrt{X}$'s, for example, are just as meaningful as inferences based on untransformed scores.

If additivity of treatment effects is the principal concern of an experimenter, the appropriateness of a particular transformation can be determined by a test of nonadditivity that is described in Section 5.3. This test provides a means of determining if treatment effects are additive for the untransformed scores and for any transformations that may be tried. A mathematically sophisticated exposition of general issues involved in the use of transformations is given by Box and Cox (1964).

TABLE 2.7-2 Transformations Applied to Largest and Smallest Scores in Table 2.7-1

	Treatment Levels			$\frac{\text{Range}_{\text{largest}}}{\text{Range}_{\text{smallest}}}$
	b_1	b_2	b_3	
Largest score (L)	4	7	12	
Smallest score (S)	0	2	6	
Range =	4	5	6	6/4 = 1.50
$\sqrt{L + .5}$	2.12	2.74	3.54	
$\sqrt{S + .5}$	.71	1.58	2.55	
Range =	1.41	1.16	.99	1.41/.99 = 1.42
log (L + 1)	.6990	.9031	1.1139	
log (S + 1)	.0000	.4771	.8451	
Range =	.6990	.4260	.2688	.6990/.2688 = 2.60
1/(L + 1)	.20	.12	.08	
1/(S + 1)	1.00	.33	.14	
Range =	.80	.21	.06	.80/.06 = 13.33