

Verbal Proficiency: A Confounding Variable in the Reliability of Children's Attitude Scales?

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BARLING, JULIAN. *Verbal Proficiency: A Confounding Variable in the Reliability of Children's Attitude Scales?* CHILD DEVELOPMENT, 1979, 50, 1254-1256. To investigate the role of verbal ability/IQ in the reliability of children's attitude scales, 309 children (M age = 120.24 months, $SD = 13.01$) were divided into 8 groups on the basis of their scores in the Peabody Picture Vocabulary Test. These children completed the Nowicki-Strickland Locus of Control (LOC) Scale (which has items formulated as sentences) and the Children's Psychological Conservatism Scale (the items of which are presented in catch-phrase format). Cronbach's α reliability coefficient was computed for each of the 8 groups on both scales. The results demonstrated a curvilinear relationship between verbal ability and the reliability of the LOC scale, while no discernible relationship categorized that between verbal proficiency and Cronbach's α on the conservatism scale. It was argued that these results emerged on the LOC scale alone since it required considerably more verbal proficiency, and two reasons were advanced for this phenomenon: Children with greater verbal ability perceived more ambiguity in these items and were more susceptible to implicit demand characteristics.

A primary concern in the construction and standardization of children's attitude scales is ensuring their reliability. In reporting reliabilities obtained on children's scales, it is usually assumed that if a satisfactory reliability exists for the total sample, the scale is reliable. However, Gorsuch, Henighan, and Barnard (1972) have shown that this assumption is not necessarily valid. Utilizing both the Bialer Locus of Control (LOC) Scale, and Miller's revision thereof, they demonstrated that verbal ability confounds the reliability of the scale: A linear relationship existed between verbal ability and the scale's reliability. They hypothesized that children with below-average verbal ability were responding on a random basis because of deficiencies in the verbal skills required by the scale's items.

Nonetheless, two factors limit any generalizations from their study. First, although Gorsuch et al. (1972) graded their subjects according to verbal ability, no exact information is provided regarding specific verbal ability levels. Second, the choice of the Bialer scale is suspect: It is far less reliable than the Nowicki-Strickland Children's LOC Scale (Nowicki & Strickland 1973), while almost half its items are consecutively keyed in one direction, possibly inducing a response set (Fincham & Bar-

ling 1978). It is feasible, therefore, that Gorsuch et al.'s (1972) results are population and/or questionnaire specific. This issue is of some import, however, as any results based on non-reliable scales might be regarded as a result of random responses and thus spurious. Consequently, the present study investigated this issue with a group of children who differed markedly in terms of their verbal proficiency. Their responses on Nowicki and Strickland's (1973) LOC Scale and the Children's Psychological Conservatism Scale (Nias 1972) were recorded; the latter scale is presented in catch-phrase format, which reduces the role of response set (Orpen 1971) and may also require less verbal comprehension.

Three hundred and nine white school children (M age = 120.24 months, $SD = 13.01$; 150 boys and 159 girls) completed the LOC scale and the Children's Psychological Conservatism Scale, both of which have been shown to be of predictive value within the South African context (see Barling & Fincham 1978; Barling & Fincham 1979, respectively). These children were then divided into eight groups on the basis of their scores on the Peabody Picture Vocabulary Test (PPVT) (Dunn 1965), and Cronbach's α reliability coefficient was computed separately for the eight groups on both

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the scales. (The Spearman-Brown prophecy formula was invoked to simulate 50 items in the LOC scale.) It would appear as though there was a curvilinear relationship between verbal ability and the reliability of the LOC scale, although no discernible relationship emerged in terms of the psychological conservatism scale (see table 1). To assess this issue further, separate partial correlations were computed between the linear and curvilinear components of verbal IQ and the reliability of the LOC and conservatism scales separately.¹ In terms of the reliability on the conservatism scale, the linear component of verbal proficiency accounted for 10.62% of the variance, and the curvilinear component 2.65%. On the other hand, although the linear component of verbal ability explained only 3.09% of the variance in the reliability of the LOC scale, the curvilinear component now accounted for 35.39%.

The results of the present study demonstrate that, in certain circumstances, the relationship between verbal proficiency and the reliability of children's scales may be curvilinear. In the present study, considerably more verbal proficiency was required for completion of the LOC scale (the items of which are presented in sentence format) compared with the conservatism scale (presented in catch-phrase format).² In terms of the variance explained by the partial correlations, the results tend to demonstrate that the relationship between verbal proficiency and the reliability of the LOC scale was curvilinear, while no observable relationship characterized that of verbal proficiency

and Cronbach's α obtained on the conservatism scale (see table 1).

In accounting for this phenomenon, two hypotheses are advanced. First, it may be that high verbal ability children perceive more ambiguity in those items necessitating relatively more verbal ability, such as the LOC scale, which would reduce the consistency of their responses. This is indirectly supported by the results on the conservatism scale: it is possible that less ambiguity is perceived in the items on this scale, which is reflected in the fact that no curvilinear trend emerged in the reliability of the eight groups on the conservatism scale. Second, it is feasible that implicit demand characteristics were more salient for children with above-average verbal IQ, as they were significantly more internally oriented than their less verbally proficient counterparts, $r(307) = -.16$, $p < .002$, even though no conceptual relationship exists between verbal ability and LOC orientation (Phares 1976).

Two implications emerge. First, in constructing children's attitude scales, it appears necessary to either (a) obtain separate reliability coefficients, or (b) construct separate but equivalent scales for groups that differ in verbal ability. Second, any conclusions based on questionnaires previously considered valid for all groups (e.g., the relationship between LOC and academic achievement [Phares 1976]) are necessarily questionable. However, it remains for future research to investigate whether similar findings would emerge if inferential analytic techniques were to be used.

TABLE 1
RELIABILITY OF THE TWO SCALES ACROSS ALL EIGHT GROUPS

	GROUP							
	1	2	3	4	5	6	7	8
<i>M</i> verbal IQ	79.19	89.95	96.94	101.12	105.88	111.83	118.27	128.46
Reliability:								
LOC52	.65	.67	.91	.70	.70	.65	.66
Conservatism57	.24	.92	.54	.55	.50	.58	.82

¹ Statistical inferences could not be drawn from the multiple regression as the number of measurements per predictor variable (namely, four) precluded the use of regression analyses as an inferential technique (Kerlinger & Pedhazur 1973). An alternative would have been to increase the number of groups by reducing the number of subjects per group. However, this alternative was rejected as it would have increased the probability of the reliability scores themselves varying as a result of chance. Consequently, the results were interpreted descriptively rather than inferentially.

² It may have been instructive to compare the relative reading difficulty required by each of the two scales. However, since most readability formulas require the analysis of a certain number of sentences per passage (see Grunder 1978), this was not possible as the items in the psychological conservatism scale are all presented in catch-phrase format.

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