

Review of **Learning Styles Inventory, Version III**, by Theodore Coladarci¹

DESCRIPTION. The Learning Styles Inventory, Version III (LSI-III) “is designed to measure student preferences for nine instructional strategies commonly found in elementary and middle school classrooms” (technical and administration manual, p. 1). The LSI-III takes 15 minutes to complete, is self-scoring, and has forms for elementary (Grades 2-5) and middle-levels (Grades 6-8). Equipped with a 5-point rating scale (0 = really dislike, 1 = dislike, 2 = not sure, 3 = like, 4 = really like), students communicate their preferences for Direct Instruction, Instruction through Technology, Simulations, Projects, Independent Study, Peer Teaching, Drill and Recitation (elementary form only), Discussion (middle-level form only), and Teaching Games (middle-level form only). Sample items are “Listen to your teacher explain new information” (Direct Instruction), “Use a computer program to solve a problem” (Instruction through Technology), “Interview adults about careers you are interested in pursuing” (Simulation), “Study on your own to learn new information” (Independent Study), “Prepare a written report with a committee” (Projects), “Have a friend help you learn difficult material” (Peer Teaching), “Be quizzed by your teacher to see if you understand a story you read” (Drill and Recitation), “Have a discussion on a topic suggested by the teacher” (Discussion), and “Practice vocabulary words by playing a word game” (Teaching Games). Through a scoring process described below, students ultimately receive for each instructional strategy a “converted score” that putatively corresponds to one of five preference levels: very low (converted scores of 1-2), low (3-4), average (5-6), high (7-8), and very high (9-10). Teachers are encouraged to use these converted scores “to help create a more responsive learning environment” (technical and administration manual, p. v) by matching instructional practices to students’ preferences “whenever appropriate” (technical and administration manual, p. 4).

DEVELOPMENT. This latest version of the LSI is “the result of a lengthy process that began with a review of the items found on the original instrument” (technical and administration manual, p. 11). Curiously, the rationale and development of the original instrument—which provides the basis for LSI-III—are left to the imagination of the potential user. In any case, the review involved feedback from classroom teachers, experts in gifted education (for an undisclosed reason), university professors, and graduate students. Together, the collection of reviews resulted in 85 items that were then factor analyzed. The factor analyses, conducted on a research sample of 2,260 elementary and middle-level students from 14 states, produced the 56-item elementary LSI-III (seven factors) and the 62-item middle-level LSI-III (eight factors).

TECHNICAL. The LSI-III technical manual provides information on scoring, reliability, and validity, each of which raises troubling questions about the integrity of this instrument. Regarding scoring, a student’s converted score (or preference level) for a particular instructional strategy has a decidedly norm-referenced flavor, because the authors use T-scores, based on research-sample data, to translate raw scores to converted scores. The composition of the research sample, therefore, is of legitimate concern to potential users, for it is the likes and dislikes of these students that provide the normative context within which users ultimately

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interpret their students' preferences levels. What we find is not encouraging. For example, the research sample is predominantly Caucasian (elementary, 88%; middle level, 96%), and, further, a disproportionate number of students in the sample are gifted-inexplicably more so at the elementary level (41%) than at the middle level (17%). About 62% of the middle-level sample is from the suburbs, compared to 40% for the elementary sample; for urban areas, the figures are 17% and 1%, respectively. Further, there are many more fourth and fifth graders than third graders in the elementary research sample (even fewer second graders), and half of the students in the middle-level research sample are sixth graders. In short, although the authors announce that "there are no norms" for the LSI-III (technical and administration manual, p. 3), the scoring process nevertheless raises questions about the representativeness of the research sample and, therefore, the appropriateness of the LSI-III for various segments of the population. This problem easily could have been avoided by using a reporting scheme that relies directly on the raw scores, the interpretation of which would be guided by the language of the rating scale (0 = really dislike, 1 = dislike, 2 = not sure, 3 = like, 4 = really like).

The authors report coefficient alpha for each LSI-III subscale. These internal consistency reliability coefficients range from .74 (Peer Teaching) to .85 (Direct Instruction) for the elementary form and .76 (Discussion) to .89 (Direct Instruction) for the middle-level form. The corresponding standard errors of measurement, which are not provided but can be calculated from available information, result in marked uncertainty regarding a student's converted score and, therefore, about the reported preference level itself. Consider the direct instruction subscale (elementary), where $SD = 6.1$ and coefficient alpha = .86. The raw-score standard error of measurement is thus 2.36. If we apply this value to a raw score of 18, we see that the 95% confidence band extends from 13.3 to 22.7. Although a raw score of 18 corresponds to a converted score of 5 (an "average" preference level), the lower and upper limits of this confidence band correspond to converted scores of 4 ("low") and 7 ("high"), respectively. Such imprecision is unacceptable. Unfortunately, it is not unique to this particular subscale of the LSI-III.

As for validity, the authors' argument is thin. As noted above, no information is provided regarding the rationale and development of the original instrument. For starters, why *these* instructional strategies? And how is the LSI-III superior to competing instruments? Turning to statistical evidence, the authors' factor analyses show that LSI-III items cluster generally as intended, although there are several curious exceptions where an instructional strategy surfaces for one grade span but not the other. For example, there is no Teaching Games factor at the elementary level, even though such games arguably are relevant to these students as well. In their post hoc explanation of this discrepancy, the authors invoke the middle-level student's "maturity and metacognitive understanding" (technical and administration manual, p. 29). Nevertheless, it is difficult to understand why items about spelling bees, flash cards, board games, and the like fail to find a statistical home in the elementary-level factor analyses (but succeed to do so at the middle level).

Further, the authors' interpretation of factors sometimes is questionable. Regarding the Projects factor, for instance, an examination of item language suggests that this factor is more about a preference for collaboration than for project-based work. And consider the Drill and Recitation factor, which includes "Work on assignments that have questions that you can correct on your

own,” “Fill in the missing word to complete a sentence on an assignment,” and several other items that bear little unique relation to this method of instruction as I understand it. In short, when the LSI-III reports a high preference level for a student (the aforementioned problem of imprecision notwithstanding), the teacher does not necessarily know what it is that the student prefers.

A final comment on validity: The authors provide scant evidence in support of adapting instruction to a student’s learning style. Validity evidence in this regard boils down to the results of a few unpublished studies and two published studies of questionable relevance. (The research participants were airmen in one and university students in the other.)

In the learning styles literature, it seems that the strongest claims about the underlying research base tend to come from those in the instrument-development business, whereas decidedly less positive conclusions tend to be reached by individuals having no vested interest in this enterprise. Even though three decades old, the conclusion reached by Cronbach and Snow (1977) in their seminal *Aptitudes and Instructional Methods* is just as appropriate today. After considering the extant research, they concluded that “[t]hese studies cast doubts upon the appropriateness of assigning students to their preferred instructional method. . . . All in all, . . . the evidence discourages the romantic view that self-selection of the instructional diet pays off” (p. 478). A similar conclusion was reached by Doyle and Rutherford (1984, p. 22): “Advocates of matching models often claim that their methods increase student achievement The weight of the evidence does not, however, support such claims” (p. 22). Further, the LSI-III authors do not acknowledge an important caveat to the matching argument, which is that students also are well served by striving to accommodate the various instructional strategies and modes of presentation they face in school-and will continue to face in the postschool world. It is in this spirit, I believe, that Sternberg and Williams (2002, p. 143) encourage teachers to develop flexibility in the student by providing “some instruction that fits students’ learning styles but other instruction that *challenges them to adjust the way they learn*” (also see Good & Stipek, 1983, p. 34; italics added). It’s about functioning in a world that does not always cater to our preferences. In any case, absent a strong empirical basis for matching instruction to student preference-which the LSI-III authors encourage potential users to do-it is not clear why one would adopt the LSI-III.

SUMMARY. The LSI-III scoring process raises troubling questions about the adequacy of the research sample, reliability coefficients point to considerable imprecision in the preference levels, and validity evidence is weak. In his review of an earlier edition of the LSI-III, Low (1985) opened by stating that the instrument “does not appear to be a useful measure of learning styles” (p. 841). Unfortunately, the intervening decades do not permit a more positive conclusion for the LSI-III.

REVIEWER'S REFERENCES

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