

Research on Social Work Practice

<http://rsw.sagepub.com/>

Kolb's Learning Style Inventory: Issues of Reliability and Validity

Jeffrey J. Koob and Joanie Funk
Research on Social Work Practice 2002 12: 293
DOI: 10.1177/104973150201200206

The online version of this article can be found at:
<http://rsw.sagepub.com/content/12/2/293>

Published by:



<http://www.sagepublications.com>

Additional services and information for *Research on Social Work Practice* can be found at:

Email Alerts: <http://rsw.sagepub.com/cgi/alerts>

Subscriptions: <http://rsw.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

Citations: <http://rsw.sagepub.com/content/12/2/293.refs.html>

Kolb's Learning Style Inventory: Issues of Reliability and Validity

Jeffrey J. Koob

California State University at Long Beach

Joanie Funk

University of Georgia

Kolb's Learning Style Inventory (LSI) is a very popular assessment tool despite compelling arguments against its use. Provided is a summary of the salient issues concerning the LSI. Arguments against its use, including suspect methodology, misapplication of statistical procedures, logical inconsistencies in theory construction, and a general lack of support for reliability and validity are examined. In addition, current research studies supporting its continued popularity are presented. The authors conclude that it is important for social work researchers, educators, and practitioners to examine the psychometric properties of any instrument prior to making decisions based on unsubstantiated findings.

The Learning Style Inventory (LSI) (Kolb, 1976, 1984) is both widely accepted yet highly criticized as a measurement tool to assess learning styles. Whereas current research findings lend little empirical support for this popular assessment tool, a number of journal articles from various fields frequently cite and use the instrument unaware of the LSI's questionable psychometric properties. This article, therefore, provides an overview of the critical dialogue surrounding the validity and reliability of the LSI.

The first section of this article provides a description of the instrument and the construct that it purports to measure. The second section provides significant studies that have implemented the LSI. The third section reports the numerous problems and criticisms related to the research and application of the LSI. The fourth section offers an evaluation of the LSI, specifically as it relates to the profession of social work. In the conclusion, a determination is made concerning the appropriateness of the LSI as a measurement tool to assess different learning styles. Finally, social workers are cautioned from

Authors' Note: Correspondence may be addressed to Jeffrey J. Koob, Department of Social Work, California State University, 1250 Bellflower Boulevard, Long Beach, CA 90840-0902; e-mail: jkoob@csulb.edu.

Research on Social Work Practice, Vol. 12 No. 2, March 2002 293-308
© 2002 Sage Publications

using any instrument before the psychometric properties are clearly established and understood.

DESCRIPTION OF THE LSI

Theoretical Construct

The LSI was developed by David Kolb (1976, 1984) to assess individual learning styles. Kolb's concept of learning style is based on his theory of experiential learning, referred to as the Experiential Learning Model (ELM). Kolb's work reflects the influence of Piaget (developmental studies), Dewey (experiential learning), Lewin (dialectical tension between analytical thinking and concrete experience), and Jung (ideas of types and nonpreferred modes of learning) (Kolb, 1976). The ELM suggests that human beings learn by their direct experience of the world, by reflecting on their experience, by conceptualizing and thinking abstractly about the world, and by actively participating in the world. Learning is defined by Kolb (1984) as "the process whereby knowledge is created through the transformation of experience" (p. 38). This process is mediated on four dimensions that include the following: (a) affective (sensing, feeling), (b) symbolic (cognitive, thinking skills), (c) behavioral (doing), and (d) perceptual (skills of observation). Postulating a developmental theory of learning, Kolb envisions these four dimensions as establishing the base of a cone, with the four dimensions creating an apex as the individual develops and the learning style becomes more complex.

Kolb defines four learning modes that correspond to these dimensions. These are conceptualized as learning abilities and identified as follows: (a) Concrete Experience (CE) (feeling), (b) Reflective Observation (RO) (reflection, watching), (c) Abstract Conceptualization (AC) (abstractness, thinking), and (d) Active Experimentation (AE) (action, doing). Learners, according to the model, must resolve a dialectical tension between immediate concrete experience and analytical detachment. In Kolb's model there are two learning continuums. Learners must choose a location between AC to CE on one continuum and AE to RO on the other. These two learning continuums or learning dimensions are polar opposites (i.e., forming two bipolar continuums). The combination of choices one makes between abilities indicates both a preference for one ability over another and a preference for a specific construct or combination of abilities, namely, a learning style (Kolb, 1976, 1984).

Learning style is defined by Kolb (Smith & Kolb, 1996) as "how a person deals with ideas and day-to-day situations" (p. 1). Kolb posits that learning is

a developmental process that proceeds in a clockwise and cyclical fashion from CE, to RO, to AC, to AE, and back to CE where the process continues to cycle. The dialectical tension between the polarized abilities challenges the learner continually to resolve conflicts between the abilities and integrate them into increasingly sophisticated skills. Over time, learners develop a preference for either AC (abstractness) or CE (concreteness), and either AE (action) or RO (reflection). The specific combination of these preferences reveals four learning styles: the diverger, the assimilator, the converger, and the accommodator. Each learning style has characteristic modes of relating to ideas and day-to-day situations. Divergers are interested in people, generate ideas, and tend to be imaginative. Divergers have chosen reflective observation (RO) over active experimentation (AE) and concrete experience (CE) over abstract conceptualization (AC). By contrast, convergers prefer things rather than people, are relatively unemotional, and are good at logical deductions. Convergers are individuals who have chosen AC over CE and AE over RO. Assimilators, on the other hand, have reflective observation (RO) and abstract conceptualization (AC) as their dominant modes. These individuals are excellent at inductive reasoning and assimilating information, less interested in people than things, and more interested in logic than precision of correctness and application. Finally, the accommodator has chosen concrete experience (CE) and active experimentation (AE). These individuals are at ease with people and enjoy new experiences. They are considered risk takers and problem solvers (Smith & Kolb, 1996).

Administration and Scoring

The LSI is a 12-item self-assessment instrument intended to evaluate individual preferences for a specific learning style. Participants are asked to rank order statements assessing how well he or she “thinks each one fits with how (he/she) would go about learning something” (Smith & Kolb, 1996, p. 1) in different learning situations. The activity of ranking the items in each row (forced scaling) is conceptualized as paralleling the learning process itself: forcing participants to choose between opposing abilities. As the four-stage learning model reflects abilities that are polar opposites (CE/AC and RO/AE), the learner must continually choose between these sets of learning abilities. The choices that one makes are presumed to indicate their preferred learning ability in each learning situation described by the items.

Rank order ranges from 1 (the least like you) to 4 (the most like you). Each of the 12 items form rows of four statements that describe the individual learning process. The first statement of each row corresponds to CE, the second to RO, the third to AC, and the fourth to AS. Cumulative scores on the

four learning abilities are reflected by summing down the 12 items by columns: Column 1 items are indicators of CE approaches to learning, Column 2 reflects RO, Column 3 items are indicators of AC, and Column 4 represents AE. The resulting raw scores can range from 12 to 48. The degree to which one prefers one ability over another learning ability is determined by subtracting scores ($AC - CE$ and $AE - RO$). By plotting a combination of scores for each learning ability on a four-quadrant graph (created by intersecting the two continuums), Kolb identifies the four learning styles described above. The diverger falls in quadrant one and learns by concrete experience and reflective observation. Assimilators appear in quadrant two and learn by reflective observation and abstract conceptualization. Convergers are found in quadrant three and learn by abstract conceptualization and active experimentation. Accommodators appear in quadrant four and learn by concrete experience and active experimentation (Kolb, 1976, 1984; Smith & Kolb, 1996).

Estimated time for administration of the LSI is 10 minutes (Smith & Kolb, 1996). Participants are asked to rank order their responses (no ties allowed) in each set to the next set of statements in the next item. Participants are advised that there are no wrong answers. Finally, participants are reminded that the purpose of the instrument is to assess individual skills in learning from experience (Smith & Kolb, 1996).

EMPIRICAL SUPPORT

Research Application

Hopkins (1993) notes that the LSI has been frequently cited in a number of journals related to various fields, such as nursing, medicine, sociology, applied ergonomics, science, economics, and psychology. Admittedly, the LSI has been applied in a number of research projects involving diverse issues and disciplines such as computer education and statistics (Hudak & Anderson, 1990), arts and science (Willcoxson & Prosser, 1996), counseling (Abbey, Hunt, & Weiser, 1985), health professions (Katz & Heimann, 1991), library science (Piette, 1995), gender analysis (Philbin, Meier, Huffman, & Boverie, 1995), and vocational training (Green & Parker, 1989). In general, these researchers found the LSI particularly useful in heralding an appreciation for diversity, identifying useful interventions, and promoting an atmosphere of greater appreciation for differences among learners. In general, however, these studies are descriptive, not predictive, in nature. The LSI has been strongly criticized for its use as a predictive tool (Hunsaker, 1980; West, 1982).

One exception was a study by Hudak and Anderson (1990) that supported the LSI's predictive validity. In this study, 94 undergraduate students in an Introduction to Statistics class were administered both the LSI and the Formal Operations Reasoning Test (FORT) at the beginning of the semester. The researchers report that the LSI effectively differentiated the successful students from the unsuccessful ones. The authors also noted a high correlation between the results of the LSI and the FORT (which assesses individual abilities for formal operational thought). In conclusion, the results of this study indicated that the LSI and the FORT inventories were adequate measures by which student success in statistics and computer science could be predicted. The authors highlighted the need to examine cognitive maturity and learning style and recommended that college teachers "no longer assume that their students are ready for high-level abstraction" (Hudak & Anderson, 1990, p. 233). This one study, however, offers little support for the use of the LSI as a predictive tool, and descriptive studies do not always support Kolb's findings.

One such descriptive study promoted the use of the LSI in distinguishing differences between American and Singaporean management students (Noi & Chi-Ching, 1994). The researchers reported that the main differences in the samples were found in the domain of concrete experience (CE). After adjustments were made for cross-cultural differences, the researchers reported that the LSI adequately differentiated art, social science, and business majors (diverger) from science and law (assimilator), medicine (converger), and computer science majors (accommodator). Contrary to Kolb's hypothesis, however, business majors were divergers (not accommodators). Also, computer science majors were not convergers as Kolb suggested but rather marginal accommodators. The researchers concluded that the differences in managerial orientations of the Singaporean students relative to the U.S. students can be explained by their differences in learning.

Research Application in Social Work

In general, little attention is given by social work to the LSI. Two recent articles (1998 and 1994) that do appear in the social work literature, however, both focus on field education and both follow the course of the numerous other fields, extolling rather than analyzing the instrument. Van Soest and Kruzich's (1994) research (building on an earlier study by Kruzich, Friesen, & Van Soest, 1986), for example, looked at the influence of learning styles in field placements for social work students. Although these researchers did not note improvement in learning outcomes as a result of matched styles, they did

report that the student/field instructor relationship was enhanced by matched learning styles. In addition, they specifically identified concrete experience (CE) as the most favored learning style for both students and their supervisors. They concluded that field instructors should use the learning style that individual students prefer. Therefore, as a descriptive tool, these researchers found the LSI useful. It is not surprising, however, that the researchers did not note improvement in learning outcome, because for that hypothesis they were attempting to use the LSI as a predictive tool.

Raschick, Maypole, and Day's (1998) research also examined social work field instruction. These researchers supported the use of the LSI, recommending the LSI as an effective tool to improve social work field instruction. One finding reported in this study asserted that both field supervisors and students were largely accommodators and that students with greater pre-MSW experience were more concrete than abstract in their thinking. Another finding suggested that students with similar learning styles rated their learning experience as better. Despite the fact that the researchers disagreed with the theoretical underpinnings of the LSI (specifically the stage development concept, i.e., that learners begin with CO and progress to the other stages), they nonetheless professed that Kolb's theory and the LSI offered tools to match specific teaching styles to specific learning styles. On the basis of this research, they recommended an increased emphasis on reflective teaching techniques in social work field education and promoted the Kolbian model as useful in improving the "quality of teaching and learning" (p. 40) in social work field education. It is interesting that the researchers cited no criticisms or shortcomings of the instrument but rather accepted it at face value.

A final note with regard to social work literature, and somewhat disconcerting, is the attention given to the LSI in social work-related doctoral dissertations (Davis, 1984; Dawson, 1987; Epstein, 1996; Houle, 1984; Platania, 1985; Polinger, 1991). Again, these researchers have extolled rather than analyzed the instrument. Fortunately, however, they have used the LSI as a descriptive rather than a predictive tool. Recall that it is as a predictive tool that the LSI receives the most criticism (Hunsaker, 1980; West, 1982).

A critical analysis of Kolb's LSI indicates suspect methodology, logical inconsistencies in theory construction, and misapplication of statistical procedures. In an attempt to make sense of the inventory's broad application relative to lack of empirical support, Hopkins (1993) concluded the following: "It is difficult to believe that its theoretical grounds are widely understood, or even that they are important to those who have found the Kolbian instrumentation interesting and useful" (p. 47). Given these concerns, it is encouraging that social work has not been quick to embrace the LSI. With recent attention to this instrument in current social work literature, however, it is important

that we take a critical look at the instrument before we make decisions on unsupported grounds.

As a final note, certainly the LSI is not the only choice for social workers who are interested in assessing learning styles. Notable alternatives include the Grasha-Riechmann Student Learning Style Scales, General Class Form (SLSS) (Riechmann & Grasha, 1974), the Dunn Learning Style Inventory (Dunn, Dunn, & Price, 1975), and the Johnson Decision Making Inventory (DMI) (Coscaerelli, 1981, as cited in Ferrell, 1983). Unfortunately, in a comparison of these three instruments and the LSI, Ferrell concluded that "No one instrument stood out as better than the others" (p. 39). Ferrell further concluded that all four instruments are lacking in construct validity and cautions the user to be aware of the numerous shortcomings of the instruments.

One further comparison was conducted by Newstead (1992), who examined the reliability and validity of the Approaches to Studying Inventory (ASI) (Entwistle & Ramsden, 1983) and the LSI. Newstead concluded that the LSI was relatively unreliable, with the ASI, although needing further refinement, being a much better alternative to assessing learning styles.

ANALYSIS AND CRITIQUE

Overview of Main Propositions

Understandably, an essential element in the development of a scale is the activity of defining the construct (Spector, 1992). The LSI is itself an operational definition of Kolb's experiential learning theory. Because items, evaluative response choices, and scoring procedures chosen for the LSI attempted to reflect these underlying propositions, it is relevant to highlight the main propositions of Kolb's process.

There are six propositions that Kolb specifically identifies (Kolb, 1984).

1. Learning is best conceived as a process, not in terms of outcomes (p. 26).
2. Learning is a continuous process grounded in experience (p. 27).
3. The process of learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world (p. 29).
4. Learning is a holistic process of adaptation (p. 29).
5. Learning involves transactions between the person and the environment (p. 35).
6. Learning is the process of creating knowledge (p. 35).

Other assumptions that are promoted by the theory include the following:
(a) the belief that effective learners are able to access all four distinct learning

abilities (AC, CE, AE, and RO) in a cyclical phase-oriented fashion; (b) the belief that learners must choose between two dialectically opposed learning dimensions; (c) the belief that the most effective learners are integrated learners (integrating all four learning abilities); and (d) the belief that the process of moving from one learning ability to the next never follows a predictive pattern. These assumptions are important because they are, on one hand, widely applied as facts upon which individual learners are assessed, and on the other hand, highly criticized for their lack of empirical support. In addition, logical inconsistencies in theory construction become evident as Kolb attempts to provide empirical support for his theory through the LSI.

Theoretical Problems

Hopkins (1993) cited a number of theoretical inconsistencies, a few of which are cited here: (a) science largely depends on objective measures and outcomes, both of which Kolb rejects—nonetheless, he insists on conceptualizing individual learning experience in scientific terms; (b) none of Kolb's propositions deal with the objective quality of an individual's learning experience, "yet Kolb claims he is speaking of experience" (Hopkins, 1993, p. 48); (c) Kolb associates interdependence and variability with learning, yet fails to acknowledge these processes through defining their interactions or attempting to establish them through measurement procedures; (d) while claiming that the variable (learning abilities) is interdependent and variable, he uses static states (learning styles) to describe them; (e) Kolb claims that effective learners need to integrate the four learning abilities, yet uses forced scaling that is devoid of theoretical flexibility and provides no means to assess this integrated learner; and (f) similarly, although it is theoretically feasible for a learner to be strong on all four abilities or weak on all four abilities, the instrument's ipsative scoring makes it impossible to identify such individuals.

Statistical Problems

Reliability problems. The LSI's reliability is plagued with a number of conceptual and methodological problems. Kolb's initial test-retest scores were very low (Kolb, 1976). In defense of these scores, Kolb pointed out that test-retest reliability should be significantly less than 1. This, according to Kolb, is consistent with the underlying premise that learning modes are interdependent, context contingent, and variable (Kolb, 1984). Kolb used a similar defense for his initial internal consistency ratings. Kolb cited the inter-

dependence of LSI items as contrary to the split half procedure. Therefore, in 1976, Kolb also negated the importance of split half coefficients to determine internal consistency, insisting that the variable nature and context driven evaluation of the construct of learning style suggested that coefficients be significantly less than 1.

Perhaps Kolb's weakest defense for his low reliability scores rests on his assertion that he is measuring an unmeasurable construct (Kolb, 1976). This defense led Kolb to conclude that traditional criteria for reliability were simply not applicable to the LSI. It makes little sense to deny statistical principles as inapplicable and then claim statistical support. Yet, the 1996 manual reports coefficients for internal consistency ranging from .71 to .85, a marked improvement over the previous low scores.

In light of Kolb's previous defense (low scores are consistent with the underlying theoretical construct), high scores could present a conceptual inconsistency. Nonetheless, from a statistical perspective, it may solve some significant problems. Statistical principles hold that without reliability, there is no assurance that a scale will consistently measure a construct. Therefore, without reliability, an instrument (also) cannot be considered a valid measure (Ruble & Stout, 1994). Yet, do these statistics suggest a reliable instrument?

Ruble and Stout (1994) say no. These researchers criticize Kolb's use of the Spearman-Brown split half coefficients. The Spearman-Brown formula, according to Ruble and Stout, reflects the highest correlation between items and is not the best estimate of average internal consistency (i.e., alpha coefficient). In addition, it rests on the assumption that the two halves are strictly parallel and assigned randomly. Ruble and Stout (1994) asserted that Kolb deliberately divided the instrument to yield the highest coefficients. Also, due to the interdependence of item factors, the inventory was not divided into parallel parts.

Normative data have also been criticized. Kolb normed the LSI based on a sample of 1,446 adults between the ages of 18 and 60. The sample included 638 men and 801 women of ethnically diverse backgrounds. The sample population had completed an average of 2 years of formal education after high school (Noi & Chi-Ching, 1994) and represented a wide range of career backgrounds. Ruble and Stout criticized Kolb's norming process on the basis of his use of ipsative scoring. Ipsative scores cannot give information relative to a group mean. The scores are only indicative of the participant's interpreted assessment of self. They are not relative to others. In addition, ordinal measures are not equally spaced. Conclusions suggested as if the categories were interval can lead to false inferences concerning one's learning style. (For example, one may be slightly dominant in CE and rank it as a 4, whereas another participant may be strongly dominant in CE and also rank it as a 4.)

Reliability is considered a necessary (but insufficient) condition for validity (Carmines & Zeller, 1979). Although an instrument is a valid measure if it measures what it purports to measure, Kolb seems to have significant problems with reliability that in itself proposes problems with validity.

Validity problems. Kolb's own analysis seems to validate at least one type of validity (i.e., discriminant validity). In the 1996 manual, his data appear on a graph of the four-quadrant scale. The graph indicates that the LSI successfully differentiates 22 career choices into one of the four learning types. Whereas Kolb does not report specific detail of his examination of validity in the 1996 Technical Manual, Hudak and Anderson (1990) explain that Kolb correlated his LSI with personality tests, its relationship with preferences for teachers and learning situations, and the relationship between learning style and career chosen. These researchers report the correlation of preferences for teachers and learning situations as "especially strong" (p. 232) with correlations for individual scales of .50. Other researchers such as Green and Parker (1989) and Philbin et al. (1995) have also found that the LSI differentiates learning styles. Hudak and Anderson's study (1990) was the one study that lent support to the predictive validity of the instrument.

Validity, nonetheless, has been questioned. Ruble and Stout (1994) pointed out that Kolb's scale scores do not match his theoretical construct. For example, if a participant receives a score of 2 for AC-AE and 2 for AE-RO, he or she would be identified as a diverger. Divergers are described as best at concrete experience and reflective observation. Yet, the individual score for an AC of 2 and an AE of 2 actually indicates preferences for abstract conceptualization and active experimentation.

In a series of studies appearing in *Educational and Psychological Measurement* (1991, 1992, 1993, 1994), construct validity is also questioned. The 1991 study by Cornwell, Manfredo, and Dunlap charged that the rank ordering system used by Kolb to assess learning style was inappropriately applied. These critics explained that the ipsative scaling on a set of variables for one person cannot be used to determine differences across individuals (i.e., learning styles). The 1992 study by Geiger, Boyle, and Pinto found support for only two of the ability dimensions and little support for Kolb's bipolar dimensions. The 1993 report by Geiger, Boyle, and Pinto found support for two bipolar learning dimensions but not the two described by Kolb (learning dimensions ran from CE [feeling] to AE and RO [watching], to AC [thinking]). Results of the 1994 study by Cornwell and Manfredo indicated "again the lack of utility of the Kolb LST [learning style types] typology to support his theory regarding learning styles" (p. 327). These researchers, however,

did support the general concept that individuals use different learning strategies. Similarly, Hudak and Anderson (1990) found support for the four learning abilities but could not substantiate the bipolar dimensions that purportedly give rise to learning styles. Loo (1999), on the other hand, found the opposite: support for the bipolar dimensions, but no support for the four learning abilities.

In summary, it is accepted that a good measurement scale is both reliable and valid (Spector, 1992). A critical analysis of the LSI, however, raises serious questions concerning both the reliability and the validity of the instrument. There is conflicting support for the specific bipolar continuums and for the individual learning abilities. It is the bipolar categories that frame and give rise to the identification of learning style. Even though the instrument has been reported as differentiating individuals into the specific quadrants, suspect methodology, misapplication of statistical procedures, logical inconsistencies in theory construction, and a general lack of support for reliability and validity suggest that the LSI does not provide an adequate measure of learning styles. However, it does seem to measure something. Although there is research supporting the LSI's discriminant validity and some suggesting the predictive validity of the instrument, specifically what is being measured remains unclear.

GENDER CONCERNS

There may also be some gender concerns. Hare-Mustin and Marecek are cited by Enns (1993) as highlighting the feminist perspective. These authors underscore the possible "social consequences of theories that emphasize contrasts between men and women" in general, explaining that "they may be used to exaggerate differences, minimize similarities, and justify inequities between men and women" (p. 8). Given the conceptual, methodological, and statistical problems associated with the LSI, the possibility that the LSI would identify false differences and/or similarities between people offers further support for this feminist approach that prescribes caution. In addition, the feminists continue, whereas learning styles are purported to be neutral with regard to intelligence, specific authors clearly promote the idea that certain styles are more valued for specific learning tasks and/or performance in school. In light of the present concerns with regard to the LSI, it would be inappropriate to use this measurement instrument to identify and advise individuals relative to their purported (and possibly false) learning styles. This should serve as a serious caution to social workers contemplating the use of

the LSI. In addition, it should serve as a caution of using any instrument before the psychometric properties are clearly established and understood.

THE PROBLEM OF STYLE

Although a complete review of the learning style construct is beyond the scope of this article, it is important to note a number of serious problems with the larger construct of learning styles in general. First, the construct deals with hidden processes that occur inside the brain (Browne, 1986). These processes can only be inferred. They cannot be identified by direct observation (i.e., empirically). Second, numerous authors and researchers comment on the difficulty associated with conceptual definitions of the construct. Some authors, such as Emmanuel and Potter (1992), assert that there are no definitions of student learning styles anywhere in the literature. Other researchers, such as Gardner (1996), claim that there are too many definitions in the literature, so many that the definitions are “as varied as the individual dealing with the concept” (p. 585). Third, many of the definitions contradict each other. Schmeck (1983), for example, asserts that individual learning styles are relatively stable across tasks (cited in Verheij, Stoutjesdijk, & Beishuizen, 1996). Smith’s (1976) research findings, on the other hand, indicate that learning styles vary according to the type of subject matter studied (cited in Coker, 1995). Finally, there are numerous problems with operational definitions, leading some authors, such as Verheij et al. (1996), to describe the construct as “fuzzy” at best and others, such as Gardner, to conclude that the construct simply does not exist.

Gardner (1996) sums up the problem of style nicely. First, he describes the multidefinitional problem: “Some [researchers] consider physical modes, some address cognitive issues, some consider psychological or emotional aspects of learning styles and others use a combination of some or all of these options” (p. 19). Second, he draws an analogy to six blind men in a poem by John Saxton:

According to the poem, six blind men chance upon different parts of [an] elephant; each man describes the part in relation to what he feels: a tree, a snake, a fan, a rope, etc. (p. 19)

In similar fashion, Gardner (1996) asserts that it is unclear in any of the operational definitions offered by researchers whether the individual components that they have identified organize together to create any meaningful descrip-

tion of learning style. In short, they conclude that research has failed to substantiate that the construct exists at all.

DISCUSSION AND APPLICATIONS TO SOCIAL WORK

The lure of the LSI across the numbers of professions and disciplines seems to rest on its good intentions. Social work has similar good intentions. Characteristic social work approaches such as person-in-environment, the strengths perspective, our emphasis on social policy and action, heralding of the underdog, and appreciation for diversity are echoed throughout Kolb's work. Kolb, for example, asserts that a primary purpose of the LSI is its ability to operationalize a person-in-environment approach (Kolb, 1976). He believed that this could be accomplished by identifying modes of interaction between individuals and their environment. The strengths perspective, so familiar to social workers, is also echoed in efforts to improve education by accommodating individual differences in learning styles. The Kolbian theory that underlies the LSI is presented by Kolb as a theory that appreciates and supports diversity and one that has important implications for social policy and action (Kolb, 1976). He believed that constructive efforts that are directed toward assessing the influence of the dominant technology and symbolic culture would lead to greater understanding for minorities, the poor, workers, women, and people in developing countries. This belief is certainly congruent with social work efforts and intentions.

Despite the similarity between the values and goals of social work and the Kolbian intentions, very little energy has been focused on Kolb in social work research, education, or practice. This silence may be viewed as acquiescence, especially because some social work research does promote rather than evaluate the instrument. To be sure, social work supports efforts toward social justice, the protection of minorities, appreciation for diversity, and an emphasis on a strength perspective. Instruments that lack empirical verification, whether used in research, education, or practice, present potential risks of ethical violations, such that social work may unwittingly contribute more to social injustice rather than social justice, misrepresent rather than protect minorities, and create rather than appreciate diversity. Social workers need to be leery of supporting techniques that ultimately belie intended goals.

In conclusion, good intentions and popularity are insufficient supports for social work research, education, or practice. Although the statistical analysis and the research reviewed for this article lend some support for Kolb's individual abilities as he has defined them, ambiguous research findings on the

learning style categories themselves indicate that the learning style construct cannot be confirmed. In addition, methodological problems, theoretical inconsistencies, and potential ethical concerns plague the LSI. Therefore, although the notion of Kolb's learning styles seems to be inviting, the LSI cannot be said to be an adequate measure of learning style.

In addition, the rather global popularity of the LSI (and the larger construct of learning style, in general) suggests the possibility that large numbers of people are misrepresented by the LSI and accordingly ill advised. Silence does little to address the problem of a broadly applied and most likely inaccurate instrument. Barring future research, it is important for social workers to evaluate rather than promote, highlight, or ignore the numerous problems associated with the LSI or any instrument used in social work research, education, or practice.

REFERENCES

- Abbey, D., Hunt, D., & Weiser, J. (1985). Variation on a theme by Kolb: A new perspective for understanding counseling and supervision. *The Counseling Psychologist, 13*, 477-497.
- Browne, D. (1986). *Learning styles and Native American information analysis*. Reproductions available through EDRS.
- Carmines, E., & Zeller, R. (1979). *Reliability and validity assessment*. Newbury Park, CA: Sage.
- Coker, C. (1995). Learning style consistency across cognitive and motor settings. *Perceptual and Motor Skills, 81*, 1023-1026.
- Cornwell, J., & Manfredi, P. (1994). Kolb's learning style theory revisited. *Educational and Psychological Measurement, 54*, 317-327.
- Cornwell, J., Manfredi, P., & Dunlap, W. (1991). Factor analysis of the 1985 revision of the Kolb's learning style inventory. *Educational and Psychological Measurement, 51*, 455-462.
- Davis, C. A. (1984). An approach to resolving issues in the workplace: A study of cognitive styles as a variable in the person-work environment fit of social work majors graduated from the Southern Baptist Theological Seminary, 1970-1980 (Kentucky). Doctoral dissertation, University of Louisville, 1984. *Dissertation Abstracts International, 45*, 0452.
- Dawson, B. G. (1987). Assessing growth in undergraduate social work field education: Applications of Perry's scheme of intellectual and ethical growth and Kolb's experiential learning theory. Doctoral dissertation, Memphis State University, 1986. *Dissertation Abstracts International, 47*, 4299.
- Dunn, R., Dunn, K., & Price, G. E. (1975). *Learning style inventory manual*. Lawrence, KS: Price Systems.
- Emmanuel, R., & Potter, W. (1992). Do students' style preferences differ by grade level, orientation toward college, and academic major? *Research in Higher Education, 33*, 395-414.
- Enns, C. (1993). Integrating separate and connected knowing: The experiential learning model. *Teaching Psychology, 20*, 7-12.
- Entwistle, N. J., & Ramsden, P. (1983). *Understanding student learning*. London: Croom Helm.
- Epstein, B. N. (1996). The relationship of student-field instructor cognitive style matching to field instructor ratings of student performance in the practicum setting (learning). Doctoral

- dissertation, University of Pennsylvania, 1996. *Dissertation Abstracts International*, 57, 1845.
- Ferrell, B. (1983). A factor analytic comparison of four learning-styles instruments. *Journal of Educational Psychology*, 75, 33-39.
- Gardner, H. (1996). Probing more deeply into the theory of multiple intelligences. *NASSP Bulletin*, 80, 583-588.
- Geiger, M., Boyle, E., & Pinto, J. (1992). A factor analysis of Kolb's revised learning style inventory. *Educational and Psychological Measurement*, 52, 753-759.
- Geiger, M., Boyle, E., & Pinto, J. (1993). An examination of the ipsative and normative versions of Kolb's revised learning style inventory. *Educational and Psychological Measurement*, 53, 717-725.
- Green, D., & Parker, R. (1989). Vocational and academic attributes of students with different learning styles. *Journal of College Student Development*, 30, 395-400.
- Hopkins, R. (1993). David Kolb's experiential learning machine. *Journal of Phenomenological Psychology*, 24, 46-62.
- Houle, T. D. (1984). Stability and variation in undergraduate social work student learning styles. Doctoral dissertation, University of South Dakota, 1983. *Dissertation Abstracts International*, 44, 2686.
- Hudak, M., & Anderson, D. (1990). Formal operations and learning style predict success in statistics and computer science courses. *Teaching of Psychology*, 17, 231-234.
- Hunsaker, J. (1980). The experiential learning model and the learning style inventory: An assessment of current findings. *Journal of Experiential Learning and Simulation*, 2, 145-152.
- Katz, N., & Heimann, N. (1991). Learning styles of students and practitioners in five health professions. *Occupational Therapy Journal of Research*, 11, 238-244.
- Kolb, D. (1976). *Learning style inventory*. Boston: McBer and Company.
- Kolb, D. (1984). *Experiential learning*. Englewood Cliffs, NJ: Prentice Hall.
- Kruzich, J., Friesen, B., & Van Soest, D. (1986). The assessment of student and faculty learning styles: Research and application. *Journal of Social Work Education*, 22, 22-30.
- Loo, R. (1999). Confirmatory factor analysis of Kolb's learning style inventory (LSI-1985). *British Journal of Educational Psychology*, 69, 213-219.
- Newstead, S. E. (1992). A study of two "quick-and-easy" methods of assessing individual differences in student learning. *British Journal of Educational Psychology*, 62, 299-312.
- Noi, L., & Chi-Ching, Y. (1994). Learning styles and their implications for cross cultural management in Singapore. *Journal of Social Psychology*, 134, 593-600.
- Philbin, M., Meier, E., Huffman, S., & Boverie, P. (1995). A survey of gender and learning styles. *Sex Roles*, 32, 485-493.
- Piette, M. (1995). *Library instruction: Principles, theories, connections, and challenges*. Binghamton, NY: Haworth Press.
- Platania, J. V. (1985). Adult learning and patterns of organizational development: As seen at the Institute of Clinical Social Work. Doctoral dissertation, The Wright Institute, 1984. *Dissertation Abstracts International*, 45, 2698.
- Polinger, E. J. (1991). The effect of student-field instructor similarity on their respective perceptions of the field practicum in social work education. Doctoral dissertation, University of Maryland-Baltimore, 1991. *Dissertation Abstracts International*, 52, 1897.
- Raschick, M., Maypole, D., & Day, P. (1998). Improving field instruction through Kolb learning theory. *Journal of Social Work Education*, 34, 31-42.
- Riechmann, S. W., & Grasha, A. F. (1974). A rational approach to developing and assessing the construct validity of a student learning style scales instrument. *Journal of Psychology*, 87, 213-223.

- Ruble, T. L., & Stout, D. E. (1994). *A critical assessment of Kolb's learning style inventory*. Reproductions available through EDRS.
- Smith, D., & Kolb, D. (1996). *User guide for the learning style inventory: A manual for teachers and trainers*. Boston: McBer and Company.
- Spector, P. (1992). *Summated rating scale construction: An introduction*. Newbury Park, CA: Sage.
- Van Soest, D., & Kruzich, J. (1994). The influence of learning styles on student and field instructor perceptions of field placement success. *Journal of Teaching in Social Work, 9*, 49-69.
- Verheij, J., Stoutjesdijk, E., & Beishuizen, J. (1996). Search and study strategies in hypertext. *Computers in Human Behavior, 12*, 1-15.
- West, R. F. (1982). A construct validity study of Kolb's learning style types in medical education. *Journal of Medical Education, 57*, 795-796.
- Willcoxson, L., & Prosser, M. (1996). Kolb's learning style inventory (1985): Review and further study of validity and reliability. *British Journal of Educational Psychology, 66*, 247-257.