Testing of nursing theory: Critique and philosophical expansion

The authors first critique Silva's 1986 article in *Advances in Nursing Science* entitled "Research Testing Nursing Theory: State of the Art." They specifically focus on her evaluation criteria for the empirical testing of nursing theory and then develop evaluation criteria for three alternative approaches to theory testing in nursing. In addition, they describe how philosophy in general, and epistemology in particular, affect testing of nursing theory. Finally, they raise philosophical issues and state conclusions related to the testing of nursing theory within the discipline and practice of nursing.

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The [person] who is swimming against the stream knows the strength of it.

—Woodrow Wilson

IN THE FALL OF 1986, an article by Silva[1] entitled "Research Testing Nursing Theory: State of the Art" appeared in this journal. It began with the preceding quotation and ended with a plea for nurse theorists, researchers, and clinicians to move testing of nursing theory into the nursing research mainstream. Now, almost 6 years later, what is the nature and strength of that stream? To address this question, the authors

- identify the major strengths and limitations of Silva's article and chronicle how the evaluation criteria for theory testing within the article have been refined since its publication;

- discuss how philosophy, with an emphasis on epistemology, affects testing of nursing theory;
- identify three other approaches, in addition to that of Silva's, that constitute testing of nursing theory;
- reflect on philosophical issues that address relationships among nursing knowledge development, testing, and implementation; and
- state conclusions based on the content, trends, and issues addressed in this article.

CRITIQUE OF THE SILVA ARTICLE

Strengths

For over two decades before Silva's article was published, nurse scholars talked and wrote about the need for research testing nursing theory; however, little actual theory testing occurred. Reasons for this absence included lack of clarity about the term "testing of nursing theory" and how this testing could and should be used to advance nursing science. The first and major strength of Silva's article, then, was increased clarity about a term that was overused but little understood. She achieved this clarity by delineating the following seven evaluation criteria that distinguished the testing of nursing theory from other types of evaluation criteria in nursing research:

1. A purpose of the study is to determine the underlying validity of a designated nursing model's assumptions or propositions.
2. The nursing model explicitly is stated as the theoretical framework or one of the theoretical frameworks for the research.

3. The nursing model is discussed in sufficient breadth and depth so that the relationship between the model and the study hypotheses or purposes is clear.
4. The study hypotheses or purposes are deduced clearly from the nursing model's assumptions or propositions.
5. The study hypotheses or purposes are empirically tested in an appropriate manner.
6. As a result of this empirical testing, indirect evidence exists of the validity (or lack thereof) of the designated assumptions or propositions of the model.
7. This evidence is discussed in terms of how it supports, refutes, or explains relevant aspects of the nursing model.[1(p4)]

Silva labeled the preceding criteria as *formative*. By so doing, she left open the door for others to build upon her work.

A second strength of Silva's article was the distinction made between evaluation criteria for testing of nursing theory and evaluation criteria for the overall quality of a research study. In other words, a study could adequately meet evaluation criteria for theory testing, yet fail to meet evaluation criteria for other research components such as adequate sample size. This insight helped to clarify further the different purposes and types of evaluation criteria in research.

Additional strengths included the application of the preceding seven evaluation criteria to three studies that served as exemplars of empirical research that tested nursing theory[2-4] and a discussion of three impediments to the testing of nursing theory: lack of investigator commitment, intolerance of methodological imperfections, and inad-

equate retrieval strategies to locate theory-testing studies in nursing.

Limitations and refinements

Ironically, the article's greatest strength (ie, clarification of the term "testing of nursing theory") was also one of its limitations; that is, the seven formative evaluation criteria needed more precision and scope. As nursing science advanced, other nurse scholars such as Chinn and Kramer,[5] Fawcett,[6] Meleis,[7] and Walker and Avant[8] refined the wording of the criteria, added new criteria, or further defined theory-testing research. In the September 1991 issue of *ANS*, Acton, Irvin, and Hopkins,[9] using the work of Silva and others, identified 15 criteria for evaluating theory-testing research, although 14 of the criteria were generic to any discipline. Thus, taken together, the preceding authors further contributed to the refinement of the concept of evaluation criteria for empirical theory testing in nursing and, as a result, strengthened Silva's seven formative criteria.

A second limitation of Silva's article was its boundaries. Although Silva gave a plausible explanation for choosing the five nursing theories used for identifying research based on these theories (referred to as models in the 1986 study), the results could not be generalized to all nursing theories in existence in 1986. Thus, the degree to which the results might have differed if all nursing theories recognized at the time had been included in the article is the degree to which the results reported in Silva's article may have been compromised. (The five theories included in the 1986 article were Johnson's Behavioral Systems Model, Roy's Adaptation Model, Orem's Self-Care Deficit Model, Rogers' Science of Unitary Human Beings Model, and Newman's Health Model.)

This discussion focuses on a third limitation of the Silva study: Only one approach to the testing of nursing theory was described. A review of the seven formative criteria and three exemplars shows that this approach was primarily deductive and empirical, thus reflecting the philosophical position of logical positivism and the correspondence theory of truth (to be discussed later in this article). The goal, therefore, is to expand Silva's initial work by delineating formative evaluation criteria for three other approaches to the testing of nursing theory: verification through critical reasoning; verification through description of personal experiences; and verification through application to nursing practice. The three approaches are not necessarily mutually exclusive nor are they exhaustive. They were selected to reduce the dogma associated with logical positivism[10] and to provide a plausible starting point for further clarification of the concept of testing of nursing theory.

Prior to describing the relationship of philosophy to the three other theory-testing approaches, the authors offer the following definitions of theory testing and of nursing theory as used in this article. Theory testing includes one or more processes through which one verifies whether what was purported or experienced is indeed so, or whether what was purported or experienced solves problems of significance in one's discipline or practice. The focus is *nursing* theory (or its surrogate terms). We define nursing theory as a tentative body of diverse but purposeful, creative, and logically interrelated perspectives that help nurses to redefine nursing and to understand, explain,

raise questions about, and seek clarification of nursing phenomena in their research and practice.

PHILOSOPHICAL EXPANSION: VALIDITY OF NURSING KNOWLEDGE

The relationship between theory testing (science) and philosophy will now be examined. According to Kneller, "the philosopher considers questions that arise before and after the scientist has done his [her] work."[11(p3)] Broadly speaking, when nurse scholars advance nursing knowledge through its development, refinement, or testing, they have entered into the philosophical arena of epistemology. The goal of epistemology is the study of the fundamental characteristics of knowledge. According to Koestenbaum, "Epistemology is important because it examines the foundation of

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Nursing knowledge, including testing of it, cannot divorce itself from the questions that epistemology raises.

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all knowledge [italics added]."[12(p160)] Thus nursing knowledge, including testing of it, cannot divorce itself from the questions that epistemology raises. Such questions are: What are the origins of knowledge? What is the structure of knowledge? What are the methods of knowledge? What are the limits of knowledge? What determines the validity of knowledge?[12] From an epistemological viewpoint, this article focuses primarily on the *validity* of one type of nursing knowledge—nursing theory. The question of the validity of nursing theory, then, becomes

the common theme for addressing the approaches to and evaluation criteria for the verification of the three alternative approaches to the testing of nursing theory discussed in this article.

The validity of knowledge raises the difficult epistemological question of what constitutes truth. Philosophers have addressed this question through various theories of truth, none of which is entirely satisfying. To highlight their complexity, three such theories are addressed here with a brief synopsis of each and mention of associated problems.[12,13]

The correspondence theory of truth

In this theory, truth is based on the metaphysical perspective of dualism; that is, truth is viewed as a congruent relationship between linguistic symbolic forms (intramental processes) and real states of affairs (extramental realities). Thoughts, words, or beliefs must fit objective facts. The assumption herein is that facts have existence and can be verified or falsified by sensory data brought to bear upon them. However, one's thoughts, words, or beliefs—no matter how strongly justified—cannot create truth if they do not fit the facts, or at the very least the facts of the day. A problem with the correspondence theory of truth is that it does not take into account or account for phenomena that do not fit objective facts or sensory data; thus, it is not always possible to test for correspondence.

The coherence theory of truth

In this theory, truth is based on the metaphysical perspective of monism; that is, truth is viewed as the internal consistency and relatedness of parts to wholes to produce a parsimonious, coherent, and aes-

thetic entity. Regarding theory development this means that, for a given theory, each theory proposition is internally consistent not only with other theory propositions but also with the overall theory. Thus, a product is produced hewn out of logic, insight, intuition, and wisdom that possesses inherent beauty. However, a problem with the coherence theory of truth is that it fails to recognize external realities that could affect both its unity and the testing of that unity.

The pragmatic theory of truth

In this theory, truth is based on the metaphysical perspectives of relativity and utility; that is, truth is viewed as truth whenever it is perceived to be so, and truth is intertwined with what is workable or practical in the real world. As a result, when a theory is put into practice, it successfully performs the functions it purports and gets itself classified as true. However, successful application into practice may fail for reasons external to the theory. Thus, a problem with the pragmatic theory of truth, as with the prior two theories of truth, is that it has too often failed tests of verification.

Because of the problems inherent in the preceding theories of truth, Laudan[14,15] considers truth and probable truth as irrelevant to scientific progress. In their place, Laudan offers two theses:

- the first and most important test for a theory is that it satisfactorily solves problems of significance within a discipline, and
- adequate solutions to significant problems within a discipline are more important theory evaluation criteria than are issues of truth.[14]

Given the preceding overview, what can be said philosophically about the testing of nursing theory and the validity of nursing knowledge? First, nursing knowledge in general, and testing of nursing theory in particular, deal primarily with epistemological concerns. Thus, each nurse scientist who undertakes testing of nursing theory has developed implicitly, if not explicitly, philosophical assumptions about the validity of nursing knowledge and the nature of truth. Second, as the preceding overview of theories of truth has shown, testing and validation of nursing knowledge, including nursing theory, are complex processes. In addition, there is lack of consensus among philosophers as to the types and methods of validation (testing) of knowledge. As a result, plurality rather than consensus exists about the methods for testing of theory. This condition is philosophically important to nursing because it gives nurse theorists and researchers the intellectual freedom to justify their choices regarding different theories of truth and, thus, contributes to the advancement of nursing epistemology.

TESTING TO VERIFY NURSING THEORY: THREE ALTERNATIVE APPROACHES

Based on epistemology in general, and the validation of nursing knowledge in particular, three alternative approaches to the validation (testing) of nursing theory, in addition to that of Silva's,[1] are now presented. Each approach has been linked to one or more philosophic positions regarding truth.

Testing to verify nursing theory through critical reasoning

The verification of nursing theory through critical reasoning is an essential intellectual activity common to all four theory-testing approaches discussed in this article. It is

also the verification process that primarily constitutes truth in such disciplines as philosophy and mathematics. However, to delimit the scope of critical reasoning for this article, it will be applied to the process of critique. By critique is meant the ability to evaluate judiciously both the strengths and limitations of works within a given discipline and to use intellectually sound and professionally acceptable evaluation criteria as referents. The ability to critique the works of oneself and others is essential to the advancement of a discipline. Without critique, a discipline stagnates. Fortunately, in nursing, increasing attention to critique has occurred. Examples include the *Annual Review of Nursing Research*, which was first published in 1984 and focuses on critical integrative reviews; two prior issues of *ANS* (July 1985 and July 1988) that focused on critique and replication; theory and research journals and books in nursing that identify evaluation criteria or contain examples of critique; and peer review of submitted manuscripts.

Evaluation criteria to verify testing of nursing theory through critical reasoning may incorporate all three theories of truth, as well as problem-solving effectiveness. The authors suggest the following formative evaluation criteria for the *internal* testing of nursing theory using critique as one example of critical reasoning:

1. The underlying philosophic assumptions regarding what constitutes truth in the testing of nursing theory are explicitly stated.
2. The testing of nursing theory is congruent with the philosophic assumptions regarding truth.
3. The method for testing of nursing theory is congruent with the purpose for testing.

4. The purpose for testing is clearly stated and significantly advances nursing knowledge or method.
5. The testing of nursing theory is based on the simplest method needed to obtain the most valid and powerful results.
6. The testing of nursing theory is constructed so that comparable or similar verification can occur.
7. The testing of nursing theory lays the groundwork for an applied outcome.
8. The overall processes used in the testing of nursing theory exhibit internal consistency, aesthetic unity, and ethical integrity.

Testing to verify nursing theory through critical reasoning highlights strengths and exposes problems inherent in a line of reasoning. The outcome of this verification process helps scholars to clarify ambiguities, fill gaps, question existing knowledge, and seek answers to puzzling questions.

Testing to verify nursing theory through description of personal experiences

A second perspective, verification of nursing theory through description of personal experiences, can best be related to the coherence theory of truth. Personal experiences involve direct participation in one or more events that leads to one's own enhanced knowledge, insight, or wisdom, allowing one to verify the "correctness" of those experiences. Personal experiences can be powerful, predictive, and sometimes exclusive types of knowledge, accessible to and verifiable by only those who have experienced them.

Through an inductive process, descriptions of personal experiences can be analyzed not only to develop theory, but also to determine validity and to verify (test) the

theory that frames the qualitative investigation. Several recent research studies[16-20] illustrate the use of theory to enhance understanding of personal experiences. Patterson and Hale's[19] study, using Orem's Self-Care Deficit Model, is highlighted here to elucidate the concept of testing of nursing theory through verification of personal experiences.

In the Patterson and Hale study, the researchers investigated how women integrated practices related to menstrual care into their activities of daily living. The researchers related menstruation to the self-care model, pointing out that "though menstruation is clearly not an illness, it does precipitate different self-care requisites that are not present every day of a woman's life."[19(p20)] Grounded theory was used to examine the personal experiences of women who shared anecdotes about their menstrual experiences. This sharing helped to confirm or disconfirm (test) the validity of the women's menstruation experiences.

Through ongoing comparisons of personal experiences of menstruating women, the investigators were able to derive a theory of "making sure" that they believed was valid, that is, that had been verified through personal experiences. As the researchers used grounded theory strategies to conceptualize the "making sure" process, they also related subprocesses of this "making sure" process (attending, calculating, and juggling) to Orem's types of self-care operations (estimative, transitional, and productive).

Based on inductive studies similar to the Patterson and Hale study, the authors propose the following formative evaluation criteria for theory testing through verification of personal experiences:

1. A purpose of the study is to verify the relationship of the described personal experiences to the specific philosophical beliefs and assumptions that underlie the developing nursing theory.
2. Identification of the research question(s) is based on an attempt to provide elaboration of concepts related to the developing nursing theory.
3. The primary data sources include sufficient in-depth descriptions of personal experiences to capture the essence of the phenomenon under investigation.
4. Simplicity, ethical integrity, and aesthetic presentation are integral characteristics of the described personal experiences.
5. Analysis of data incorporates a sense of wholeness of the described personal experiences.
6. Formative hypotheses and/or theory are derived inductively from qualitative analysis of the described personal experiences.
7. Multiple personal experiences of an individual and/or similar personal experiences of several individuals about a particular phenomenon are used to validate the derived hypotheses.
8. Analytic procedures of data analysis and fit of the generated concepts to the personal experiences provide indirect evidence of the validity (or lack thereof) of the developed nursing theory.
9. Findings are discussed in terms of how they relate to the developed nursing theory.
10. If an existing nursing theory is used to frame a theory that is to be developed and tested inductively, both the developing and existing theories must be

internally consistent and congruent with one another.

Through use of inductive strategies in the analysis of personal experiences, researchers can both identify generalities that constitute the substance of nursing theories and provide verification (testing) of the personal experiences upon which the nursing theory is built.

Testing to verify nursing theory through application to nursing practice

A third perspective that is useful in clarifying the concept of testing of nursing theory is verification through application to nursing practice. The previously discussed perspectives related primarily to testing to verify whether what is purported or experienced is indeed so. This third perspective is concerned with testing to determine whether what is purported or experienced accomplishes its purpose. Rather than accepting or rejecting a theory as true or false, this perspective assesses and verifies scientific progress in terms of a theory's problem-solving effectiveness.[14,21] Thus, one test of problem-solving effectiveness is whether a theory can be successfully implemented into practice.

Systematic theory testing through application of nursing theories in practice with the participation of clinicians is essential for the enhancement of theory-based nursing practice.[17,22] Although this goal is essential, it is not easy to accomplish. Difficulties inherent in testing nursing theories through application to nursing practice include: (1) ability to garner needed administrative, staff, client, and legal support to conduct the implementation; (2) ability to garner needed financial support to conduct the implementation; (3) ability to measure outcomes of the implementation; (4) ability to assess whether outcomes of the implementation are consistent with the purposes set forth in the theory; and (5) ability to assess whether outcomes of the implementation are consistent with the expectations of those affected or most affected by the implementation. If the preceding abilities are accomplished, and if outcomes of the implementation are consistent with the theory, then the nursing theory has likely withstood the test of verification through practical application; that is, it has demonstrated problem-solving effectiveness as described by Laudan.[14]

An example of the concept of verifying through application is the implementing of the Roy Adaptation Model onto a unit of the Arlington, Virginia based National Hospital for Orthopaedics and Rehabilitation.[23] During implementation of the model, a variety of problem-solving strategies was used: approval of top level administration at the hospital; identification of criteria for selection of a pilot unit; selection of the pilot unit; identification and implementation of cost containment measures; procurement of faculty to teach initial inservice classes on nursing theory; shared power to implement change; organizational change of the pilot unit from team to modular nursing; and development of a nursing assessment tool that not only reflected the Roy Adaptation Model but also accommodated time constraints on a busy unit. In addition to these strategies, the following structures were revised to accommodate adaptation nursing: nursing rounds and reports; care conferences; nursing documentation; job descriptions; standards of performance; orientation of new personnel; and audit criteria.

Outcomes of the implemented project included improved patient care, improved pa-

tient satisfaction with care, enhanced professional nursing practice, and increased numbers of staff receiving baccalaureate and master's degrees. Evaluation of medical records from before and after use of the Roy model demonstrated an improvement in nurses' holistic assessment of patients. After implementation of the pilot project, the Roy Adaptation Model was implemented throughout the hospital in 1981. According to personal communication with Annette Debisette, director of nursing on a unit at the hospital (October 1991), the model is still working well, and staff continue to see positive outcomes.

Incorporating Laudan's[14] perspectives on problem-solving effectiveness, the authors propose the following formative evaluation criteria for theory testing through application to nursing practice:

1. A purpose of the application is to demonstrate the problem-solving effectiveness of a designated nursing theory for nursing practice.
2. The nursing theory is explicitly stated as the framework for the application process.
3. The plan for implementation identifies specific problems targeted for solution through application of the nursing theory.
4. The problems to be addressed represent interesting, important, and ethical problems for nursing practice.
5. Outcomes are measured in terms of problem-solving effectiveness of the applied nursing theory.
6. Problem-solving effectiveness is determined in comparison with applications in which the nursing theory is not used.
7. Findings are discussed in terms of how the nursing theory was instrumental in

defining and implementing problem-solving strategies.

Although there is growing consensus of the importance of applying nursing theory to practice and testing its effectiveness based on evaluation criteria, there are few examples of such studies documented in the literature.[22] Documentation is critical, as it helps other nurses with the "how" of applying nursing theory to practice and also provides useful information about which nursing problems were effectively or not effectively solved, thus providing a basis for modification.

PHILOSOPHICAL EXPANSION: ISSUES AND REFLECTIONS

The authors encountered several philosophical issues in the preparation of this article. The three most troubling ones are identified and reflected upon here.

Philosophical issues involving method

A particularly persistent issue was how (and why) to categorize the three alternative approaches discussed herein for the testing of nursing theory. These questions are firstly epistemological (not research) concerns related to the structure, kinds, and extent of knowledge. One example relevant to categorization and testing of nursing theory relates to a research principle that has been accepted with little questioning. That principle is as follows: When dealing with categorization of data, the resultant categories must be mutually exclusive and exhaustive. Although little in the discipline or practice of nursing is mutually exclusive or exhaustive, methodological rigor frequently demands it in certain research questions, designs, and data analyses. Thus, an unsettling dissonance is created among philosophy,

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theory/research processes, and nursing practice. That is, to obtain methodological rigor in research in general and theory testing in particular, nurses too often must sacrifice their own lived and validated experiences as practitioners of nursing. Conversely, to practice and experience nursing as it naturally occurs, nurses must consistently integrate and individualize. These two processes conflict with the processes associated with mutually exclusive and exhaustive categories. It thus follows that some research principles and methodologies (with their implicit philosophical assumptions) interfere with the testing of nursing theory because they are out of step with the accepted and actual practices of nurses.

Philosophical issues involving truth

The preceding concern leads us to a second epistemological issue regarding the testing of nursing theory. It is the issue discussed previously: What constitutes truth? Because theory testing deals with truth—its verification, falsification, or irrelevance—this issue cannot be avoided, although it has not been solved in centuries past or present, nor is it likely to be satisfactorily solved in the near future. What, then, for testing of nursing theory, are the options regarding an issue that is neither avoidable nor satisfactorily solvable?

Two options, among several, come to mind: (1) Stop all testing of nursing (or other) theory until its truth condition can be unequivocally verified, or (2) acknowledge that a philosophical issue related to epistemology exists; that is, verification processes often have led to error instead of truth. For example, in seeking truth through the empirical method (as discussed in Silva's article), a Type I or Type II error could occur. Seeking truth through critical reasoning could lead to errors arising from faulty thinking. Seeking truth from descriptions of personal experiences could allow selective recall to alter the experience so that the nature of truth is compromised. Finally, treating truth as an irrelevant criterion in nursing practice sidesteps the issue by replacing truth with problem-solving effectiveness. Although this last approach may solve significant problems in the testing of nursing theory, it does not necessarily follow that solvability leads to truth.

Therefore, although the second option with its opportunities for errors seems unsettling, it is not useless. In fact, knowing what error is constitutes a powerful truth. Thus, the second option seems clearly preferable to the first one in that it allows science, including nursing science, to advance. Although the advancement process may not be smooth, it frequently lays the groundwork for creativity and for serendipitous findings that can further clarify the type, nature, and limits of knowledge that have come to be labeled "testing of nursing theory."

Philosophical issues involving the relationship between method and knowledge

A third epistemological issue regarding testing of nursing theory deals with the relationship between method and knowledge. In nursing, method can be defined as the re-

search and clinical processes used to attain knowledge, and knowledge can be defined as the accumulation of theories, science, principles, laws, facts, and lived experiences that constitute the discipline of nursing.

The method-versus-knowledge issue is timely because of positions taken by some nurse scholars that method is more important than knowledge to the advancement of the discipline of nursing, whereas other nurse scholars have taken the position that knowledge is more important than method. The authors believe that Koestenbaum's[12] interpretation of Descartes' position on this issue is the most plausible and in the best interest of nursing. This interpretation is "that no genuine progress can be made in the metaphysical appraisal of reality without first thoroughly having justified and vindicated the methodology of knowledge itself."[12(p161)] From a philosophical perspective, then, knowledge cannot exist without a method to explicate and justify its existence, and method cannot exist without knowledge to give method its meaning. Thus, within the boundaries and definitions used in this article, testing of nursing theory implies that method and content coexist.

By identifying and reflecting upon the preceding three philosophical issues related to theory testing since Silva's 1986 article, the authors engage readers in the quest to raise significant philosophical questions about the relationships among nursing knowledge development, testing, and implementation. Examples of such questions are: What are the current structures, methods, and limits of nursing knowledge and what *should* they be to best advance the discipline of nursing? How trustworthy (ie, verifiable or testable) is this body of knowl-

edge and how trustworthy *should* it be to best advance the discipline of nursing? Regarding practice, what are the actual working practices of nurses? What *should* they be? What are significant clinical problems in search of resolution? Why are they significant? How should they be solved? Who decides? Does Laudan's notion of problem-solving effectiveness have meaning for solving problems in nursing practice? Reflections on these and other epistemologically oriented questions have implications for curriculum development in nursing, for the role and responsibilities of nurses, for the boundaries of nursing practice, for the effectiveness of nursing practice, and for the development and testing of nursing theory.

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Based on the content, trends, and issues addressed in this article, the following conclusions are drawn:

1. Evidence exists that nurse scholars have analyzed, altered, or expanded Silva's seven formative evaluation criteria for empirical testing of nursing theory, thus strengthening the criteria.

2. Evidence exists that testing of nursing theory can occur through approaches other than empirical testing and that formative evaluation criteria can be established for each approach.

3. Philosophy in general and epistemology in particular are necessary and integral to testing of nursing theory.

4. The solved and unsolved problems of epistemology profoundly affect the approaches taken and methods used not only to test nursing theory but also to interpret it and apply it to practice.

We have shown within the context of this article that nurses have systematically built

upon an area of knowledge (ie, Silva's evaluation criteria for the empirical testing of nursing theory); and have expanded this knowledge both philosophically (through epistemological consciousness raising) and methodologically (through the identification of three alternative approaches to and evaluation criteria for the testing of nursing theory). We also have shown that at least in one hospital (National Hospital for Orthopaedics and Rehabilitation) nursing theory and its testing have been alive and well for over a decade and continue to posi-

tively affect both nurses and patients. Further, we have reflected upon several epistemological issues in philosophy and in nursing that have affected the testing of nursing theory. So it can be said, based on the evidence and with a sense of pride, that during the last 6 years the strength of the stream referred to in the prelude to this article has lessened for those nurses dedicated to nursing theory and the testing and application of it. This state of affairs bodes well for the advancement of nursing science and the future of nursing.

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