

## Chapter 5

# An Analysis of Orlando's Nursing Theory Based on Kuhn's Theory of Science

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The nature and structure of nursing are of central importance to the development of scientific knowledge in nursing. This knowledge, implemented into practice, affects the quality of nursing care. Presently, nursing is viewed as a developing, immature, and preparadigmatic science. Numerous theories of nursing can be found in its literature. Although one can find advocates for each, an analysis of each theory as the or one of the possible paradigms for nursing has not been approached. The purpose of this chapter is to analyze and evaluate Orlando's theory of nursing based on Kuhn's paradigmatic theory of science.

### INTRODUCTION

The philosophy of science is in essence the analysis of the structure of knowledge. Traditionally, this analysis was done by means of rules of correspondence that were interpretative definitions formulated in mathematical logic. This approach began to be questioned in the early 1950s.<sup>1</sup> The most dramatic challenge occurred with the publication of *The Structure of Scientific Revolutions*, by Thomas S. Kuhn.<sup>2</sup> Kuhn's work resulted in a "revolution" among philosophers of science and it is probably valid to assume that the view of the development of knowledge has changed substantially since its arrival. Kuhn challenged the standard conception of science and formulated a theory of scientific knowledge that differed radically from the positivistic account. Kuhn transformed the view of the development of science by replacing the explicit formulas of rules of correspondence with those of paradigms, normal science, and revolutions. He described the present understanding of science as more or less an illusion stemming from an inaccurate description of how the structure of theories evolve.

Kuhn's theory of science provides a structure for describing the continuing evolution of science Kuhn's formulations are readily appealing

and revealing. However, on more careful scrutiny they are deceptively complex and intricately interrelated. Therefore, if they are to be used to enhance the understanding of a nursing theory it is important that the major elements of his work be presented. An awareness of the criticisms of his work is essential for evaluation as well as for providing a perspective for his further refinement of formulations. A synthesis of Kuhn's work followed by an analysis of Orlando's theory based on Kuhn's conception of a paradigmatic theory of science will be presented in the proceeding discussion.

### **SYNTHESIS OF KUHN'S THEORY**

Kuhn's theory of science is both descriptive and prescriptive, for in describing how the work of scientists is carried out, it implies appropriate conduct. Kuhn's work attempts to show how the image of science has been portrayed in ways that are misleading. He challenges the views that the development of science is cumulative in nature, linear in fashion, and carries the scientist closer and closer to the truth.

Kuhn bases his theory on three major elements--paradigms, normal science, and scientific revolutions. These elements are intricately related and the process involved in their contribution to the development of science is circular in nature. Paradigms are "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners."<sup>3</sup> They allow research to focus on selected phenomena in more detail.<sup>4</sup> Kuhn refers to this research as "normal science." Normal science does not look for anomalies and in fact often suppresses them because they are subversive to the paradigm. However, when the profession can no longer evade the continuing anomalies "then begin the extraordinary investigations that lead the profession at last to a new set of commitments, a new basis for the practice of science. . . . The extraordinary episodes. . . are the ones known. . . as scientific revolutions."<sup>5</sup> Scientific revolutions are "non-cumulative developmental episodes in which an old paradigm is replaced in whole or in part by an incompatible new one."<sup>6</sup> Following this crisis the profession shifts to the new paradigm and normal science is again practiced. Further discussion of this process follows.

#### **Paradigm**

The element in this process that has received the most attention from the scientific and professional world has been the term "paradigm." In addition

to referring to paradigm as a universally recognized achievement, Kuhn also refers to it as a foundation for the scientific community and as an accepted model or pattern. A new paradigm provides a different framework for processing data similar to a change in visual gestalt. Thus, it is a gestalt configuration.<sup>7</sup>

According to Kuhn, although rules are derived from paradigms, "paradigms can guide research in the absence of rules."<sup>8</sup> However, Kuhn also refers to paradigm as a novel theory emerging after pronounced failure of problem-solving activity.<sup>9</sup> A new paradigm is often limited in scope and precision; however, it is recognized as being able to solve problems that practitioners recognize as acute.<sup>10</sup> It, therefore, supplies a community with criteria for selecting problems that, while the paradigm is taken for granted, can be assumed to have a solution.

"The new paradigm implies a new and more rigid definition of the field."<sup>11</sup> It, therefore, serves to exclude previous problems as metaphysical or of concern to another discipline.<sup>12</sup> The commitment to a paradigm allows scientists to understand their world in great empirical detail. These commitments are conceptual, theoretical, instrumental, and methodological and guide the research under the paradigm.<sup>13</sup>

A paradigm's main function is to guide research. It provides "the methods, problem-field, and the standards of solution accepted by any mature scientific community at any given time."<sup>14</sup> A paradigm is seldom an object of replication, but like a judicial decision, it permits further articulation and specification under new and more restricted conditions.<sup>15</sup> Paradigms not only explain the abstract concepts of a phenomenon, they also supply the procedures and applications that are necessary to science as they serve to restrict the phenomenological field.<sup>16</sup> Research not based on a paradigm seldom leads to any conclusion. "Without commitment to a paradigm, there could be no normal science."<sup>17</sup>

### **Normal Science**

"Normal science, the activity in which most scientists inevitably spend almost all their time, is predicated on the assumption that the scientific community knows what the world is like."<sup>18</sup> To defend this assumption, normal science tends to suppress fundamental novelties because they are subversive to its basic commitment.

In normal science, the scientist is an expert puzzle solver. The solution of the puzzles of normal research requires complex conceptual, instrumental, or mathematical formulations. "Though intrinsic value is no criterion for a puzzle, the assured existence of a solution is."<sup>19</sup> To classify as a puzzle a problem must be characterized by more than an assured solution.

Rules that limit both the nature of acceptable solutions and the steps by which they are to be obtained must also be identified.

Governed by these restrictions, normal science consists mainly of fact gathering. The facts are not simplistic in nature but are critical to the accumulation of knowledge under the given paradigm. Kuhn refers to the research of normal science as "mop-up work." Normal science does not attempt to search for new phenomena and does not see it when it exists. Paradigms restrict vision but that is essential in order that a part of nature can be studied in detail and in depth.<sup>20</sup> This restriction of the phenomenological field also serves the purpose of helping to identify anomalies. ". . . [N]ovelty ordinarily emerges only for the man [sic] who, knowing *with precision* what he should expect, is able to recognize that something has gone wrong. Anomaly appears only against the background provided by the paradigm."<sup>21</sup>

When anomalies continue to occur, and the paradigm can no longer be adjusted to account for them, research changes from normal science to extraordinary investigations. This is the beginning of the scientific revolution, a process that results in one paradigm replacing another. Revolutions begin when an existing paradigm fails to function adequately in the exploration of the nature it previously helped define. Malfunction is a prerequisite to revolution.<sup>22</sup>

## **Revolution**

Kuhn's description of the period of revolution has special relevance to nursing since the behavior of scientists during this period is similar to that of the preparadigmatic period. There is a state of growing crisis and professional insecurity in that the old paradigm fails to solve the problems it should. There is a blurring of the paradigm resulting in loosening of rules for normal research<sup>23</sup> and a turn to philosophical analysis to understand the nature of the field.<sup>24</sup> An example of an accepted paradigm not solving existing problems occurred when Ptolemaic astronomy failed to account for both planetary position and precision of the equinoxes. Efforts to adjust the system made it more complex without increasing its accuracy. Finally, it was rejected and replaced by the Copernican theory of astronomy that identifies the planets as revolving around the sun rather than around the earth. "The preparadigmatic period, in particular, is regularly marked by frequent and deep debates over legitimate methods, problems, and standards for solution, though these serve rather to define schools than to produce agreement."<sup>25</sup>

These crises then give rise to new theories because of the refusal of anomalies to be assimilated into existing paradigms.<sup>26</sup> Research is focused

on the resolution of the anomaly and provides incremental data needed for the paradigm shift.<sup>27</sup> During this time "scientists usually develop many speculative and unarticulated theories that can themselves point the way to discovery."<sup>28</sup> Characteristics common to the discovery of new phenomena include an awareness of anomaly, gradual and simultaneous emergence of both observational and conceptual recognition, consequent change of paradigm categories, and procedures that are often accompanied by resistance. This resistance assures that paradigms will not be surrendered too easily and that the new paradigm will be more successful than its predecessor.

Kuhn's description of how this discovery of the structure of a new paradigm occurs to the scientist parallels the conceptual transformation required by others in the field to shift from one paradigm to another. He writes:

More often no such structure is consciously seen in advance. Instead, the new paradigm . . . emerges all at once, sometimes in the middle of the night, in the mind of a man [sic] deeply immersed in crisis. What the nature of that final stage is--how an individual invents (or finds he has invented) a new way of giving order to data now all assembled--must here remain inscrutable and may be permanently so. . . . The<sub>29</sub> resulting transition to a new paradigm is scientific revolution. . . .

### **Theory Choice**

Although Kuhn's formulations presented up to this point diverge markedly from the traditional view of science, his description of theory choice or the shifting from the old to the new paradigm represents the most radical departure from previous views.

Kuhn proposes that paradigm testing occurs only when there has been persistent failure to solve an important puzzle and when there is an alternative candidate for a paradigm. It forces each school to compare its theory's ability with the evidence at hand. However, it is not a simple issue of probabilistic verification, for Kuhn believes there can be "no scientifically or empirically neutral system of language or concepts. . . ."<sup>30</sup> Because of this incommensurability between pre- and post-revolutionary traditions, paradigm choice is not a battle that can be won by proof.<sup>31</sup>

In addition to incommensurability, there are problems of communication across paradigms because vocabulary used by each school differs in meaning. Finally, another aspect of incommensurability is that the practi-

tioners of competing paradigms practice in different worlds. They see different things when looking at the same sort of objects. Communication between the revolutionary division is inevitably partial. Debate about the merits of two paradigms tends to be circular.

Like the choice between competing political institutions, that between competing paradigms proves to be a choice between incompatible modes of community life . . . The choice is not and cannot be determined merely by the evaluative procedures characteristic of normal science, for these depend in part upon a particular paradigm, and that paradigm is at issue. When paradigms enter, as they must, into debate about paradigm choice, their role is necessarily circular. Each group uses its own paradigm to argue in that paradigm's defense.<sup>32</sup>

Kuhn's description of what compels scientists to forsake one paradigm for another is fascinating from a psychological-cognitive perspective. The shift to another paradigm requires a conceptual transformation. Kuhn writes "Just because it is a transition between incommensurables, the transition between competing paradigms cannot be made a step at a time, forced by logic and neutral experience. Like a gestalt switch, it must occur all at once (though not necessarily in an instant) or not at all."<sup>33</sup> "The transfer of allegiance from paradigm to paradigm is a conversion experience that cannot be forced."<sup>34</sup> Kuhn believes a paradigm is a prerequisite to perception. "What a man [sic] sees depends both upon what he looks at and also upon what his previous visual-conceptual experience has taught him to see."<sup>35</sup> Without this structure, there is confusion. A paradigm switch causes the scientist to see the world differently, the current one becoming incommensurable with the old. "When the transition is complete, the profession will have changed its view of the field, its methods, and its goals."<sup>36</sup>

According to Kuhn, there are factors that lead to this switch. Even though he says paradigm change cannot be justified by proof, he does believe that there can be relevant arguments that can persuade scientists to change their minds. Probably the most influential argument is that the new paradigm will solve the problems that led to the crisis.<sup>37</sup> Another reason for the change is that it appeals "to the individual's sense of the appropriate or aesthetic--the new theory is said to be 'neater,' 'more suitable,' or 'simpler' than the old."<sup>38</sup>

Theory choice is then dependent on more than the traditional rules of

correspondence. Argument in support of a new paradigm can provide a clear view of what scientific practice would be like for those who accept it. "Yet, whatever its force, the status of circular argument is only that of persuasion. It cannot be made logically or even probabilistically compelling for those who refuse to step into the circle."<sup>39</sup> Kuhn concludes that a new paradigm does not triumph ultimately through some mystical process, but that its triumph is through some first supporters who will develop it to the point of multiple arguments in its defense. Commitment to a paradigm requires taking a risk, a risk of being wrong.

## REACTIONS TO KUHN'S FORMULATIONS

Soon after Kuhn's formulations were published in 1962 support and criticism began to appear in the literature. His paradigm concept, the central element of his theory, received the most criticism. The major criticism was that its meaning was global, vague, multiple, and circular.<sup>40</sup> Since Kuhn's view of normal science and revolutions was integral to the understanding of how paradigms emerged, these areas were also addressed. Most scientists agreed with his concept of revolution, but disagreed with the process. They believe scientists focus on finding anomalies and that change from one paradigm to another is a cumulative rather than a noncumulative developmental episode.<sup>41</sup>

Kuhn also emphasizes the incommensurability between pre- and post-revolutionary paradigms. Critics disagree with him on the difficulties of comparing two different paradigms and believe that communication via a common vocabulary is possible.<sup>42</sup> Kuhn believes the same vocabulary used after a revolution has different meaning. In other words, scientists see different things when looking at the same phenomenon.

Although various aspects of Kuhn's work were criticized, the greatest reaction related to his description of theory choice, which rejected the logical comparison of theories and proposed that choice is not a battle that can be won by proof. Since theory choice could not be forced by logic, Kuhn described it as a conversion experience that is sociological in nature. Critics labeled his ideas as subjective and irrational.<sup>43</sup>

A final criticism of Kuhn's work is that he does not view a new paradigm as carrying science closer and closer to the truth, believing rather that it allows nature to be understood in more depth and detail. His rejection of rationality as the way to truth led to charges of relativism.<sup>44</sup>

Although there are many that either support or challenge Kuhn's fundamental ideas, no one individual article in and of itself is convincing in either direction for the entirety of his theory. The greatest

contributions these authors have made is that their writings have prompted Kuhn to refine and clarify to a great extent that which was somewhat obscure, confusing, and contradictory in his original work and to extend some ideas that needed further explication. The following section will include a description of Kuhn's further development of his formulations and an assessment of the appropriateness of the use of his theory by nursing.

## **KUHN'S THEORY CLARIFIED AND EXPANDED**

It is important to point out that Kuhn states that his fundamental viewpoint remains nearly unchanged. However, he does admit that his formulations on paradigms were obscure and proceeds to make a substantial effort to clarify their meaning. His formulations in this area do not elaborate or change the meaning of paradigm as a concrete achievement but develop further the nature of scientific communities and the education and initiation of its practitioners. These formulations elucidate his subsequent clarification on theory choice.

### **The Meaning of Paradigm**

The development of scientific knowledge must take into account how that science is actually practiced. Having puzzles to solve is prerequisite to being a science. Every science has criteria for what these puzzles are and when they have been or have failed to be solved. Kuhn believes that if paradigm is to be explicated scientific communities must be recognized as having an independent existence. He describes his previous writings on paradigm as having two aspects: the sociological, global sense being the shared commitment of a scientific group<sup>45</sup> and the other being the subject matter that accounts for the group's ease in communication and near unanimity of professional judgment.<sup>46</sup> At the global level "A paradigm is what the members of a scientific community, and they alone, share. Conversely, it is their possession of a common paradigm that constitutes a scientific community. . . .<sup>47</sup> These communities share a constellation of common values, goals, education, communication, and unanimity of judgment on professional issues. At a different level any scientific community, including the schools of the so-called preparadigm period, possesses paradigms. At this other level, paradigm denotes "the concrete puzzle-solutions which, employed as models or examples, can replace explicit rules as a basis for the solution of the remaining puzzles of normal science."<sup>48</sup> Philosophically, Kuhn defines this as the deeper of the two. His further interpretation of this latter meaning of paradigm is most revealing.

He now refers to paradigm as "disciplinary matrix," "'disciplinary' because it refers to the common possession of the practitioners . . . , 'matrix' because it is composed of ordered elements . . . each requiring further specification."<sup>49</sup> He identifies three elements central to it. They include symbolic generalizations, models, and exemplars. All three are used by a community in producing and validating knowledge. Changes in any one will change the focus of research as well as the standards for verification.

According to Kuhn, symbolic generalizations are found in symbolic form or expressed in ordinary words. They are accepted expressions in a community that are not challenged and, therefore, do not need special justification for their use. Kuhn considers this behavior as important "for without a shared commitment to a set of symbolic generalizations, logic and mathematics could not be routinely applied in the community's work."<sup>50</sup> An example would be  $f=ma$  (force equals mass times acceleration). They are vital to logical problem solving in that they are lawlike in nature. They are both legislative and definitional. They are uninterpreted, but imply empirical meaning; therefore, they vary in form from one application to the next.<sup>51</sup>

A second component of disciplinary matrix previously termed metaphysical paradigms he now defined as beliefs in particular models. These models help determine the yet unsolved puzzles. They are analogies that are heuristic or metaphysical in nature. Kuhn does not advance this element from his first formulations.

The most critical element to the understanding of Kuhn's work is what he now calls "exemplar." This functions as the second but the most fundamental sense of paradigm and it is the third element of the disciplinary matrix. Exemplars are the standard examples of the concrete problem solutions of a community. According to Kuhn, a verbal statement of a law taken by itself is virtually impotent for solving problems. Rather the acquisition of learning to solve problems "comes as one is given words together with concrete examples of how they [symbolic generalizations] function in use; nature and words are learned together."<sup>52</sup>

### **The Development of Theory**

This recognition of the relationship between language and nature led Kuhn originally to introduce the notion of paradigms because they could function whether or not there was theory. Learning a theory is similar to ostension. Paradigms are "concrete solutions, the exemplary object of ostension."<sup>53</sup> In other words, learning the language of a theory and acquiring the knowledge of nature embedded in that language is gained by

doing problems. This teaches the student to see different situations like each other. It signals the gestalt in which the situation is to be seen. "Having seen the resemblance, one simply uses attachments [appropriate formalism of the symbolic generalizations] that have proved effective before."<sup>54</sup> "Acquiring an arsenal of exemplars, . . . is integral to the process by which a student gains access to the cognitive achievements of his [sic] disciplinary group."<sup>55</sup> These exemplars are language-conditioned or correlated ways of seeing the world: until they are acquired we do not see a world at all. When acquired, one sees the world similar to the way other scientists in the profession see it.<sup>56</sup>

Kuhn believes that the ability to see resemblances between disparate problems plays a role usually attributed to rules of correspondence.<sup>57</sup> This knowledge is embedded in the stimulus-to-sensation route. When we learn to see things as similar to or different from other situations this recognition is systematic and involuntary. Therefore, the concept of applying rules either correctly or incorrectly is not an activity that can be done prior to the sensation. Only after the perception do we apply the criteria.<sup>58</sup>

In writing about the stimulus-to-sensation route, Kuhn notes that different stimuli can cause the same sensation. It is stimuli, not sensation, that impinge on the organism. "To an extent still unknown, the production of data from stimuli is a learned procedure. After the learning process, the same stimulus evokes a different datum."<sup>59</sup> Kuhn concludes that only within the membership of a relatively homogeneous community is there a shared response to a given stimulus. Conversely, groups who experience different sensations from the same stimulus in a sense live in a different world or see the world differently. This type of knowledge remains tacit. "In the metaphorical no less than in the literal use of 'seeing,' interpretation begins where perception ends. The two processes are not the same, and what perception leaves for interpretation to complete depends drastically on the nature and amount of prior experience and training."<sup>60</sup> This process is directly involved in theory choice.

Logical choice for selection of a theory can only occur when both theories are fully articulated. During a revolution this is not the case. Critics of Kuhn believe theory choice can be made by canons of rationality and logic; observational sentences can be put into neutral language and then a measure taken of their truth or falsity with one theory triumphing over the other. Therefore, they argue, theories are tested, judged, and justified objectively. Subjective factors do not enter into theory choice. Kuhn considers this inaccurate and elaborates on his previous ideas on this issue.

Kuhn does not believe language is independent of theory. He thinks

meanings of words change in translation from one theory to another. The words used may remain the same, but how they are applied may differ. Thus they are incommensurate.<sup>61</sup> Even though Kuhn does not think theory choice can be proved by debate, he does believe it can be resolved through persuasion by argument and counterargument. Despite what critics have said of Kuhn's lack of objectivity on theory choice he emphasized that reasons for choice remain what have usually been--accuracy, simplicity, scope, consistency, and fruitfulness--but that these reasons function as values.<sup>62</sup> Scientists may differ in the value they place on each or they might disagree in their judgment about specific ones. "There is no neutral algorithm for theory-choice, no systematic decision procedure which, properly applied, must lead each individual in the group to the same decision."<sup>63</sup> Effective decisions are made by the community of scientists who share particular values and experiences and one should understand how these values operate through the process of persuasion to ensure that most members of the group will select one theory over another. Thus, Kuhn sees theory choice as an intrinsically sociological process. It is a group rather than an individual decision. Theory choice involves risk, as with commitment to a paradigm, which was noted earlier, and this process that allows for variability of individual decisions is a strength since the judgment of the majority may be wrong.

### **Evaluation**

Although Kuhn addresses some attention to the nature of progress in science and to normal and revolutionary science, the major clarification of his responses were related to paradigms and theory choice. A thoughtful critique of his new ideas on disciplinary matrix is made by Suppe.<sup>64</sup> Particularly critical was Kuhn's specification that objective criteria were important for theory evaluation but that these were influenced by individual and sociological factors. His additional expansion of the meaning of paradigm clarifies how these elements can be identified in the current practice of a profession. He concretized some very abstract terms, which makes his theory much more practical for the practicing scientist.

The assessment of the value of Kuhn's work to nursing created the experience that Kuhn referred to as the gestalt switch that divided the readers of his work into two camps.<sup>65</sup> This analysis led to a firm alliance with the camp supporting his views. However, there is a valid basis for this position, particularly if one views knowledge as tacit. Unlike most theories of science, Kuhn's theory takes into account the tacitness of knowledge and the influence of sociological factors on theory choice. In other words, he does not deny the reality of what actually happens. His

theory is particularly relevant to nursing in that it is based on the fact that knowledge is embedded in nature. It is interesting to note that most nurses would agree that nursing knowledge is embedded in the nurse-patient relationship. Surprisingly however, the current research in nursing does not reflect this. This could be due to the lack of a paradigm that specifies such a focus. Viewing the nurse-patient relationship without a specific focus results in confusion, diversity, and lack of progress. The identification in each nursing theory of the concrete conceptual achievement, and the specification of the assured solution, would provide a specific focus for that particular theory. This would make it possible to build on that theory rather than to start anew, which is most often the present state of affairs.

Another major reason that Kuhn's theory would be useful to nursing is that each nursing theory, having identified its major conceptual achievement, would then develop an arsenal of exemplars that would serve as the objects of ostension for the education of new practitioners. This would result in schools basing their curriculum on a particular nursing theory; the competition among schools would serve to eliminate those theories that are less useful and to propel those that were.

Choosing to assess, implement, and develop a particular nursing theory runs the risk of being wrong. However, seldom is progress made without such an investment. In the following section, the work of Ida J. Orlando is analyzed using Kuhn's formulations.

### **ANALYSIS OF ORLANDO'S THEORY**

Although Kuhn did not address his work to the social sciences, he does not wish to discourage attempts to extend his concepts to these areas. His concepts are appealing, albeit at times elusive, and have been applied in such fields as biology, sociology, education, criminal justice, administration, and history.<sup>66</sup> Each has selected various concepts on which to focus. The major focus of the analysis of Orlando's theory will be on the notion of paradigm as a concrete achievement and on the elements of the disciplinary matrix.

Effective research cannot begin until the fundamental entity of that universe has been defined. At this time the foundation and phenomena of nursing cannot be taken for granted. Although research is being done in nursing, it appears random. Researchers are forced to build new foundations for each problem. Thus, the phenomenon, methods, and verification are different for each problem. The use of a common paradigm or several paradigms would free researchers from having to constantly re-examine

basic principles and allow focus of attention toward solving puzzles of the paradigm. Therefore, a major effort must be made to analyze the current nursing theories to identify the concrete achievement, the discovery, which could serve as the foundation for locating both the puzzles to solve and the accepted solution.

### **The Function or Professional Nursing**

Orlando is one nurse theorist who has consistently emphasized the need for nursing to identify its distinct professional function and she has also indicated the effects that result from not doing so. According to Orlando, "the function of professional nursing is a single, independent function with its own distinct product."<sup>67</sup> By "distinct function" she means "what is it that characterizes and justifies nursing's work as a profession. Whatever it is must be identifiable in every nurse-patient contact, whether the patient has a disease or not."<sup>68</sup> She describes product as "what 'should' characterize the observable behavior of the person(s) served after the professional function is carried out."<sup>69</sup> Orlando believes that distinct formulations of "function, process and product are viewed as prerequisite to the research of nursing as professional practice. The formulations not only provide a framework for evaluation but also the frame-work within which to construct the practice system where in an evaluation can take place."<sup>70</sup>

Without an explication of function the study of the process of nursing cannot proceed. Orlando views this problem as central to inadequate patient care and critical to its resolution. She does not believe "meeting health needs" as a service or subscribing to "health" as a goal gives nursing the distinction it warrants.<sup>71</sup> The distinction will come out of learning to understand what is happening between the nurse and the patient, the central core of the nurse's practice and the framework for the help the nurse gives the patient.<sup>72</sup> Thus, the distinct professional function of nursing should be found in the nature of patients' distress and their need for help.<sup>73</sup> Orlando discusses what professional nursing accomplishes:

Professional nursing is required when the "cause" of the individual's(s') inability "to nurse" the self (or another as with family members) is NOT known or clearly understood by the individual(s) or the nurse. That is, not known *before* the nurse's professional investigation is conducted. As individualized "causes" and individualized requirements are identified, the professional nurse designs the activities to ameliorate or cure the inability "to nurse" the self. . . .<sup>74</sup>

As was previously noted, the development of scientific knowledge, according to Kuhn, must take into account how that science is actually practiced and what its puzzles are. Orlando was preoccupied for some time with the thought that she did not know what a nurse was being trained to produce professionally.<sup>75</sup> In the 1950s, Orlando was hired at Yale University to integrate mental health concepts into the basic nursing curriculum. This provided her with the clinical setting to observe directly the interactions between nurses (students as well as graduates) and patients. Over a three-year period, Orlando made 2,000 records of what she heard and saw in separate contacts nurses had with patients. When she approached the analysis, she could categorize them into only two groups: one judged to be good nursing and the other bad nursing. Recommendations for categorization from sociologists and psychiatrists failed to establish mutually exclusive categories. Orlando's next step was to present a random selection of these records to nurses with dissimilar views, experiences, education, and personality. All of these nurses agreed with Orlando's categorization of what was judged good and bad nursing.<sup>76</sup> Orlando's subsequent remarks are reminiscent of Kuhn's description of a person making the discovery of a paradigm. She writes:

And then the light dawned. I decided that if the anecdotal account was the only material available to base the judgment on, then what made good or bad nursing happen had to be contained in the anecdotal record from which all those uniform judgments were made. Stated another way: specific items and/or conditions producing the good or bad outcomes had to be contained in the records which were so judged and could therefore be commonly identified.<sup>77</sup>

Orlando found that the common element of the good outcomes contained deliberative formulations (renamed "nursing process discipline" in her 1972 publication), while automatic nursing formulations were found in anecdotal records called bad outcomes. Her definition of these formulations and her ensuing conclusion (discovery) of the function of nursing follows:

In the contacts judged as good the nurse found out: 1) what was happening to the patient from the patient's point of view; 2) what the immediate distress was; 3) that the patient was distressed because he [sic] had an immediate need for help; 4) that the patient was unable to produce the outcome of relief without the

nurse's help. These items . . . led me to the inescapable conclusion that the function of professional nursing is to find out and meet the patient's immediate needs for HELP.<sup>78</sup>

Orlando's specification of the function of professional nursing is the puzzle part of the paradigm. To meet Kuhn's criteria there must be the existence of an assured solution as well. Orlando calls the solution the "product of professional nursing." Her definition of it is "the product of meeting the patient's immediate need for help is . . . improvement' in the immediate verbal and nonverbal behavior of the patient. This observable change allows the nurse to believe or disbelieve that her [sic] activity relieved, prevented or diminished the patient's sense of helplessness."<sup>79</sup> Thus, if there is no improvement in the patient's behavior, the professional function of nursing has not taken place.

It seems likely that the anomaly leading to Orlando's formulation was that often, despite the nurse's intervention, a patient's behavior remained unchanged or worsened. The problem that Orlando's "paradigm" elucidates is the patient's unclear initial expression of the need for help. The conceptual transformation or gestalt switch is from the frequently defined role of nursing, which is "meeting patients' needs," to that of *finding out* what help the patient needs and then meeting this need for help--a subtle but critical conceptual difference. Whereas Orlando's theory clearly specifies (or restricts) what distinguishes the nurse's characteristic action, "meeting patient needs" is less restrictive. In fact, such a broad concept has led to nurses taking the responsibility for many non-nursing activities, including medical tasks, all because "it's meeting patients' needs."

A more rigid definition of the phenomenological field with concurrent restriction of vision are two other aspects implicated in Kuhn's conception of a paradigm. Orlando is precise in this regard. The basic operating unit of the nursing system is the individual nurse and this involves all the contacts, actions and the results of these actions with patients, with other nurses in line or staff relationship, and with other professional and nonprofessional personnel. The nurse's contact with any one of these persons should be directed toward fulfilling the professional function.<sup>80</sup> The focus of inquiry for a professional nurse is the immediate experience of the patient and whether or not the patient requires the nurse's help. Restricting the field to the identified nursing system and the focus of inquiry to the immediate experience of the patient allows for specific and in-depth investigations of situations experienced by patients where finding out the need for help is more subtle and critical to the patient's sense of well-being.

Investigation to meet Kuhn's meaning of paradigm should be based on rules and application defined by the paradigm and data should be processed by a different framework from the old paradigm. In analyzing

Orlando's work, the rules as well as the framework for fulfilling the professional function of nursing are embedded in the function. The nurse's determination of whether a patient requires the nurse's help or not is made by the immediate exploration of the patient's verbal and nonverbal behavior by use of a definitive nursing process discipline. The requirements of this process discipline are as follows:

- (1) What the nurse says to the individual in the contact must match (*be consistent with*) any or all of the items contained in the immediate reaction and what the nurse does nonverbally must be verbally expressed and the expression must match one or all the items contained in the immediate reaction;
- (2) The nurse must clearly communicate to the individual that the item being expressed belongs to herself [sic]; and,
- (3) The nurse must ask the individual about the item expressed in order to obtain correction or verification from that same individual.<sup>81</sup>

In other words, the item is verbally expressed, is asked about, and is self designated. Examples would be: "I don't understand why you said that. Would you tell me why" (a perception is explored); or "I saw you walking about in your room, I thought you might be worried. Am I right or not?" (the thought about the perception is explored); or "When you raise your voice to me, I feel frightened because I think you want to hurt me. Do you want to hurt me?" (a feeling is expressed and the thought about the perception provoking it is explored).

The application of this nursing process was formulated from what Kuhn refers to as "learning a theory through ostension." In other words, it is based on Orlando's observations of the resemblances and differences of these formulations to patients' experiencing improvement in their sense of adequacy.

Orlando's explication of the function of professional nursing meets the criteria of Kuhn's meaning of paradigm as a concrete achievement. Her formulations are conceptual, theoretical, and methodological and define the problem field, method, and solution. This could provide the foundation for a scientific community. In the following section further analysis of Orlando's work will be based on Kuhn's elements of disciplinary matrix. The first to be considered is symbolic generalization.

### **Symbolic Generalizations**

Kuhn attaches important functions to symbolic generalizations: they are vital to logical problem solving in that they are legislative as well as

definitional and they are uninterpreted but imply empirical meaning; therefore, they vary with each application. The function of nursing serves not only as the paradigm but is also implicated in symbolic generalizations. To find out and meet the patient's immediate need for help is both definitional and legislative. It also implies empirical meaning. The nurse must get the definition of the need for help from the patient in the immediate situation. The legislative aspect is through Orlando's formulation of how the nurse "finds out." First, it is necessary to understand the elements and definition of what goes into an individual's action before comprehending how Orlando conceptualized how these elements were to be used to ensure that the need for help was found out by the nurse.

The process of a nurse's activity is based on a specific formulation of the process by which any individual acts. . . . The content of each individual's process of action is forever distinct and remains apart from anyone else's. . . . The process by which any individual acts is comprised of four distinct items. These separate items reside within an individual and at any given moment occur in the following automatic, sometimes instantaneous, sequence: (1) The person perceives with any one of his [sic] five sense organs an object or objects; (2) The perception stimulates automatic thought; (3) Each thought stimulates an automatic feeling; and, (4) Then the person acts<sup>82</sup>

The definition of each of these items is essential to differentiating their use and application in practice.

Perception: A physical stimulation of any one of a person's five senses.

Thought: An idea which occurs in the mind of a person.

Feeling: A state of mind inclining a person toward or against a perception, thought or action.

Action: Observable behavior, *i.e.*, what the individual says verbally and/or manifests nonverbally.<sup>83</sup>

The successful application and use of these items is through the use of the nursing process discipline described earlier and summarized as follows: Whatever the nurse perceives with any sense organ and thinks and feels about each perception must at least in part be verbally expressed and the patient (or person) with whom the nurse is in contact must be asked about it. This process continues through the duration of the contact and must be

repeated in every contact to ensure that the patient's immediate need for help is found and met. Actions (application) decided upon prior to the contact with the patient or without this process are automatic nursing responses and do not provide a professional service.

This would be an example. A female nurse working nights was caring for two women of the same age who both had undergone removal of the gallbladder the previous day. Both patients asked the nurse for pain medication. If the nurse complied with or refused to comply with the requests without exploration of her perceptions, thoughts, or feelings this would be an automatic personal response. This nurse could meet the legislative criteria of symbolic generalization by finding out through exploration of her perception, thoughts, or feelings that one patient was experiencing discomfort from a full urinary bladder while the other patient could not get to sleep because of a misunderstanding that occurred with her husband earlier that evening. Definitionally the need for help for one was to empty the bladder while for the other it was help in initiating a telephone call to her husband to resolve the misunderstanding. Thus, the true nature of the distress and the type of help needed varies with each nurse-patient contact and can only be determined through a shared exploration with the patient. Without recognition of this, professional nursing does not occur. (It should be noted that the nurse uses the same process with every patient. However, with patients who are unconscious or unable to speak, the nurse must base her or his actions and evaluations of outcomes on assessment of observations of such nonverbal behavior as vital signs, muscle tone, skin color, and trembling and on nonverbal vocal expressions such as moaning, crying, wheezing, and coughing.)

The following section contains Some of the problem areas in nursing reflected in the principles formulated by Orlando that hold some similarities to Kuhn's element called models.

### **Models**

The analysis of the principles that guide the nurse's observation and practice based on Kuhn's concept of models might be stretching the analogy. However, these principles are implicated directly in Orlando's major Concept, the function of nursing. According to Kuhn, models supply analogies, heuristic and metaphysical, that help determine the roster of unsolved puzzles and accepted solutions.

Orlando noted that the patient's initial cry for help is often unclear and unexplicit.<sup>84</sup> Whatever the patient's behavior, it must be viewed as a Possible manifestation of an unmet need or a signal of distress until the nurse has evidence to the contrary through exploration with the patient.

From these findings, Orlando formulated the following principle to guide the nurse's observation: *"The presenting behavior of the patient, regardless of the form in which it appears, may represent a plea for help."*<sup>85</sup> This principle could provide the basis for meaningful research. Categorizations of observable facts (presenting behavior) and the nature of the distress could be studied in groups of people nurses serve, such as the elderly, children, and the disadvantaged either economically or socially. For educational and practical purposes this information would be useful for determining the types of problems frequently experienced by these groups.

Another principle is related to the fact that actions based on thoughts and conclusions arrived at independently by the nurse are most often not helpful to the patient as they do not consider the patient's perception of the situation. These actions are considered automatic personal responses. The principle states: *"Any observation shared and explored with the patient is immediately useful in ascertaining and meeting his [sic] need or finding out that he is not in need at that time."*<sup>86</sup> Interesting research could flow from this principle. For example, what are the immediate and cumulative effects on patients when nurses use the exploratory approach? Or what are the differences in terms of specific patient outcomes such as use of medication, length of stay, and patient knowledge of treatment between patients experiencing the two types of nursing approaches? Published research based on the use of Orlando's formulations already appear in the literature.<sup>87</sup> These study findings support the validity of her approach.

Two other principles formulated by Orlando guide the nurse's action with patients. The first is *"The nurse does not assume that any aspect of her [sic] reaction to the patient is correct, helpful or appropriate until she checks the validity of it in exploration with the patient."*<sup>88</sup> The second is *"The nurse initiates a process of exploration to ascertain how the patient is affected by what she [sic] says or does."*<sup>89</sup>

In addition to serving as a means to identify problem areas in research the use of these principles by professional nurses could provide examples to new practitioners of what professional nursing would be like practiced under Orlando's paradigm. This topic will be discussed in the next and final section under the element of the disciplinary matrix Kuhn calls exemplars. The similarity between Kuhn's description of how students learn from exemplars and the teaching of Orlando's disciplined nursing process is intriguing.

### **Exemplars**

According to Kuhn, a paradigm is a prerequisite to perception; however, verbal statements of law are impotent for problem solving. A person

learns to solve problems as word and concrete examples of how the symbolic generalizations function in use. Words and nature are learned together; thus learning the theory is similar to ostension. It signals a gestalt switch. Once you learn the gestalt, you attach the methods that have proved effective in the past. Exemplars then are concrete puzzle solutions of a community, a way of seeing the world, a way of gaining entrance into the profession.

The conceptual complexity and interrelatedness of Orlando's formulations are most apparent in analyzing how a nurse fulfills professional responsibility by learning through actual examples the nursing process discipline. Orlando states that a nurse "must know and be able to validate how her [sic] actions and reactions help or do not help the patient or know and be able to validate that the patient does not require her help at a given time."<sup>90</sup> The activity of the nurse then "is professional only when it deliberately achieves the purpose of helping the patient, the activity *per se* is not the decisive criterion by which it may be evaluated."<sup>91</sup> Rather, what is evaluated is whether it helps the patient communicate her or his need for help.

Memorizing Orlando's distinct function of professional nursing or her requirements of the nursing process discipline will not help the nurse to consistently find out and meet the patient's immediate need for help. Orlando believes this can only be achieved through training in the nursing process.<sup>92</sup> She writes:

Since what a nurse says or does is the exclusive mode through which she [sic] serves the patient, then the focus for improvement is what the nurse says or does in practice and how these practices affect the process of care. Understanding how practices help or do not help the patient is the material out of which the nurse develops and improves her knowledge and skill in the practice and her professional role and identity.<sup>93</sup>

This learning process is similar to what Kuhn describes in learning a new theory through the process of ostension. The knowledge or the information required by the nurse learning Orlando's nursing process discipline is embedded in the stimulus-to-sensation route or, to put it another way, in the nurse's perception, thoughts, and feelings in response to observable patient behavior. The nurse must learn through examining his or her own process of reactions and actions that his or her perceptions, thoughts, or feelings are most often not expressed and explored with the patient in a disciplined way. Because the nurse does not use them in this way, he or she does not discover

what help the patient needs.

With the teacher's help the nurse learns to express the content of her or his reactions and thus experiences the conceptual transformation of viewing the patient's presenting behavior as a plea for help, and the observable patient's behavior as evidence of whether or not the patient's need for help was found out and met. The phenomenon is viewed in a different light. For example, the student recognizes requests from the patient about the student's personal life as a possible plea for help rather than a social gesture. Orlando writes of the nurse: "Understanding her [sic] own process of action releases her responsive capacity to focus on the exploration of her own immediate reactions and thereby understand another's process of action."<sup>94</sup> Thus, the nurse learns to impose the concept of "To find out and meet the patient's immediate need for help" on the phenomenon of every nursing situation. It becomes automatic and systematic. The nurse allows the Sensations (perception, thoughts, and feelings) from the stimuli (the patient's observable behavior) to guide action rather than deciding on an action prior to or unrelated to the exploration with the patient for his or her need for help.

Orlando's paradigm (the function of nursing) is thus the prerequisite for perception. The gestalt switch is from personal and automatic to disciplined and professional responses. This is accomplished through the concrete examples (recorded interactions the student has with patients) that the student brings to the teaching sessions. The nurse begins to see the world differently and ultimately will see the patient's behavior differently than other nurses not trained in this process. The nurse thus practices in a different world. Orlando writes that this new ability is impressive to observe but even more impressive "is the trainee's expression of greater comfort and satisfaction in work situations when the process discipline is used."<sup>95</sup> In addition, "The trainee's understanding of the process by which she [sic] can help a patient in the immediate situation enables her to find her own identity as a professional nurse."<sup>96</sup>

Orlando's formulations meet Kuhn's requirement in terms of symbolic generalization and exemplars. Whether they serve as a model is more difficult to conclude. The difficulty is related to Kuhn's sketchy and imprecise formulations of this concept. Of credit to Orlando is the fact that her formulations are unbelievably precise. Whether or not one agrees with her work, there is no doubt about what she means in her formulations. In sum, Orlando's work meets the criteria for both senses of paradigm as established by Kuhn.

Orlando's work also establishes clearly what the solution to puzzles should be, namely improvement in the observable behavior of patients.

Much needed research could be done, using her paradigm, within all types of settings, as well as in homes, with all ages of people and with people who have or do not have a medical diagnosis. In other words, her formulations are broad in scope. Her paradigm would also help to isolate anomalies, for knowing what precisely to expect allows one to recognize when that expectation is not met.

Attaining consensus for research activity is extremely difficult. However, nursing can move in that direction by using Kuhn's concept of paradigm to analyze each nursing theory and determine whether it has a major concrete achievement that isolates both the puzzle to solve and its solution. This would help establish paradigms that could be used as foundations for research. It would take time to determine which paradigms were most effective but it would provide a start.

One cannot dictate the use of a specific paradigm. However, it is strongly recommended that nurses who recognize the merits of Orlando's paradigm begin to base their practice and research on her formulations.

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