

## Analysis and Evaluation of the Theory of Unpleasant Symptoms

*Eun-Hyun Lee, RN, PhD<sup>1</sup>*

### Abstract

The theory of unpleasant symptoms is a middle-range theory proposed by Lenz and her colleagues (1997). Analysis and evaluation of this theory was performed using Fawcett (1999) and Fawcett and Downs's (1992) guidelines. Results of the theory analysis and evaluation suggest that the theory of unpleasant symptoms has theoretical and social significance and parsimony. However, a lack of internal consistency was evident. For empirical adequacy of the theory, it is recommended that research be conducted examining the complexities of the interaction effects, reciprocal relationships, and medication effects among physiological, psychologic, and situational factors, symptoms, and performance. The knowledge derived from the research findings should be used in practice for patients experiencing symptoms.

*Key words : Analysis, Evaluation, Theory of Unpleasant symptoms*

### Introduction

The theory of unpleasant symptoms (TOUS) is a middle-range theory explaining the relationships among symptoms, influencing factors and consequences. Different investigators worked on two different concepts of dyspnea in chronic obstructive pulmonary disease (Gift, 1990; Gift & Cahill, 1990) and fatigue during postpartum (Milligan, 1989) and intrapartum (Pugh, 1990). The investigators assumed that there were commonalities among symptoms, not limited to one symptom, and collaborated to identify the commonalities across multiple symptoms and different clinical populations (Gift & Pugh, 1993; Pugh & Milligan, 1993). Through the collaborative

effort of the investigators, the TOUS was introduced in 1995 as a work-in-progress (Lenz, Suppe, Gift, Pugh, & Milligan, 1995) and updated in 1997 (Lenz, Pugh, Milligan, Gift & Suppe, 1997).

One of the roles of theory, particularly middle-range theory, is to guide practice. Thus, there is an emphasis on nurses using theory for knowledge based practice. However, prior to utilization, the readiness of the theory for use in practice should be considered. Theory analysis and evaluation are ways of determining readiness.

Theory analysis is accomplished by a systematic examination of exactly what the author has written about his/her theory. It can help to determine the strengths and weaknesses

---

1. Division of Nursing Science, School of Medicine, Ajou University, Suwon, Korea  
Received 29 July 2000; Accepted 26 November 2000.

of the theory, and so help to clearly identify the need for additional development and refinement of the theory (Fawcett, 1993; Walker & Avant, 1995). Evaluation of a theory makes judgements about the potential contribution to knowledge development and the worth of the theory as a basis for health care decisions and actions (Fawcett, 1993). Therefore, analysis and evaluation contribute to helping nurses understand the TOUS clearly and identify the potential contribution of the theory to symptom related nursing practice.

The purpose of this paper was to analyze and evaluate the TOUS (Lenz et al., 1997). For the analysis and evaluation Fawcett (1999) and Fawcett and Downs's (1992) criteria were used. Theory analysis involves four steps: 1) identifying and classifying concepts, 2) identifying and classifying propositions, 3) hierarchical ordering of the propositions, and 4) diagramming the relationships between concepts in the theory. Theory evaluation focuses on significance, internal consistency, parsimony, testability, evaluation of empirical adequacy, and evaluation of pragmatic adequacy.

## Theory Analysis

### 1. Concept Identification and Classification

The first step of theory analysis is to identify the concepts of the theory, which are the basic building blocks of a theory. Once concepts are identified, they are classified on the basis of their variability and observability. Classification by variability includes nonvariable and variable concepts. A nonvariable concept has only one dimension (e. g. female). The mental image evoked by a nonvariable concept is of one and only one form of the phenomenon. When a concept has more than one dimension, the concept is variable (e. g. femaleness). Classification by observability includes observables and constructs. Observables are accessible to direct sensory observation. Constructs cannot be directly observed but must be connected to an observable concept in order to be tested empirically (Fawcett, 1999; Fawcett & Downs, 1992).

The TOUS encompasses five main concepts: symptoms (S), physiologic factors (PhF), psychologic factors (PsF), situational factors (SF), and performance (P). All the concepts are variable because they have more than one dimension. Symptoms have four dimensions: intensity, timing, distress, and quality. Physiologic factors include normal body systems, pathologic problems, and energy substrates. Psychologic factors include mental state/mood, affective reaction to illness, and degree of uncertainty/ knowledge about symptoms and their meaning. Situational factors include the social and physical environment. Performance has two dimensions: functional and cognitive. All of the concepts of the TOUS are classified as constructs because they must be connected to proxy observable terms in order to be tested empirically.

### 2. Proposition Identification and Classification

A proposition is a declarative statement about one or more concepts. There are two types of propositions, nonrelational and relational. Nonrelational proposition says something about one concept. This type of proposition is categorized as an existence proposition that states the existence of a phenomenon and a definitional proposition that defines a concept. Relational propositions link two or more concepts (Fawcett & Downs, 1992).

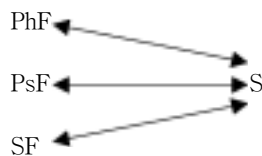
The TOUS may be formalized into five nonrelational and seven relational propositions. The nonrelational-definitional propositions are listed in Table 1. Relational propositions are stated below and the propositions are diagrammed. On the diagrams, an unbroken line indicates the existence of a relationship between the concepts. An arrowhead at one end of the line indicates an asymmetric relationship. Arrowheads on both sides of the line indicate a symmetrical relationship. A minus sign indicates that a negative relationship is specified and a question mark indicates that a relationship is suggested but the direction is not specified.

Proposition 1 "The relationships (between physiological, psychologic, and situational factors and symptoms) may be reciprocal (p. 20)."

**Table 1.** Nonrelational-Definitional Propositions of the Theory of Unpleasant Symptoms

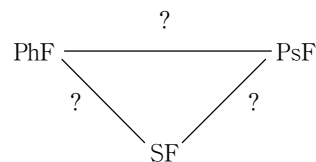
Concept	Nonrelational-Definitional Proposition
Symptoms (S)	"Symptoms are perceived indicators of change in normal functioning as experienced by patients. Although symptoms differ from one another, several dimensions are common across symptoms and clinical populations: intensity (strength or severity), timing (duration and frequency of occurrence), level of distress perceived (degree of discomfort or bothersomeness), and quality (p. 15)."
Physiologic Factors(PhF)	"Physiologic factors include normally functioning bodily systems; the existence of any pathology ; and the individual's level of energy (reflecting baseline nutritional balance and hydration level) (p.18)."
Psychologic Factors(PsF)	"Psychologic components of the model include the individual's mental state or mood, affective reaction to illness, and degree of uncertainty and knowledge about the symptoms and their possible meaning (p. 18)."
Situational Factors (SF)	"Situational factors include aspects of the social and physical environment (p.18)."
Performance (P)	"Performance is conceptualized to include functional and cognitive activities. Functional performance is conceptualized broadly to include physical activity, activities of daily living, social activities and interaction, and role performance including work and other role-related tasks. Cognitive activity includes concentrating, thinking, and problem solving. (p.19, 20)."

Proposition 1 deals with the relationship of physiological, psychological, and situational factors to symptoms. This proposition suggests symmetric relationships between the three factors and symptoms and can be diagrammed as in Figure 1:

**Figure 1.** Diagram for Proposition 1

Proposition 2 "(Physiological, psychological, situational factors) are now acknowledged to relate to one another (p.19)." Proposition 2 deals with the relationship among the physiological, psychological, and situational factors. This proposition can be restated as physiological factors are related to psychologic factors; psychologic factors are related to situational factors; and situational factors are related to physiological factors. Proposition 2 suggests the non-direction-specified existence of relationships

among the three factors and can be diagrammed as in Figure 2:

**Figure 2.** Diagram for Proposition 2

Proposition 3. "They (physiological, psychologic, and situational factors) can display an interaction effect in their relation to the symptom experience (p. 19)." Proposition 3 deals with the relationships among the physiological factors, psychological factors, situational factors and symptoms. Cohen and Cohen (1983) stated that an interaction effect means that the strength of relationship between X (independent) and Y (dependent) variables varies, depending on the third variable. Fawcett and Downs (1992) noted that one form of contingent relationships is that a third variable affects the strength of the relationship between X and Y. Therefore, the fourth proposition suggests contingent relationships. The relationships are

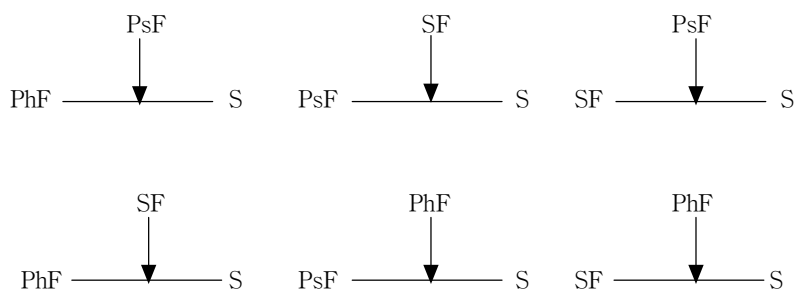


Figure 3. Diagram for Proposition 3

diagrammed as in Figure 3:

Proposition 4. "Performance has a reciprocal relation to the symptom experience (p. 20)." Proposition 4 asserts the relationship between symptoms and performance and can be restated as: symptoms influence performance and also performance influences symptoms. This proposition suggests the symmetrical nature of the relationship. This proposition can be diagrammed as in Figure 4:

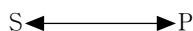


Figure 4. Diagram for Proposition 4

Proposition 5. "Decreased levels of performance can have a feedback loop to the influential factors, with a negative impact on physiological and psychological states and situational conditions (p. 20)." Proposition 5 asserts the relationships of performance to physiological, psychological, and situational factors. This proposition can be restated as: performance may be negatively related to physiological, psychologic, and situational factors. This proposition suggests the directional and asymmetrical relationships and can be diagrammed as in Figure 5:

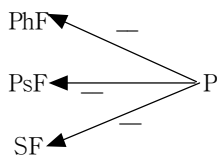


Figure 5. Diagram for Proposition 5

Proposition 6. "Symptom experience can be a moderating influence in the relationship between physiologic or psychologic status and performance (p. 20)." Proposition 6 describes the relationships among physiological and psychological status, symptoms, and performance. A moderating effect is synonymous with an interaction effect (Jaccard, Turrisi, & Wan, 1990). Thus, proposition 6 can be restated as: the strength of the relationships of physiological and psychological factors to performance may vary, depending on the symptoms. This proposition suggests contingent relationships and can be diagrammed as in Figure 6:



Figure 6. Diagram for Proposition 6

Proposition 7. "Symptom experience can be a mediating influence in the relationship between physiologic or psychologic status and performance (p. 20)." Proposition 7 deals with the relationships among physiological and psychological status, symptoms, and performance. This proposition can be restated as: physiological and psychological factors directly related with symptoms, and symptoms may relate with performance. Fawcett and Downs (1992) stated that another form of contingent relationship occurs when the third variable is directly in the path between two other concepts X and Y; thus, the three concepts form a chain. Therefore, this proposition suggests contingent relationships and can be diagrammed as

in Figure 7:

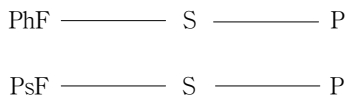


Figure 7. Diagram for Proposition 7

### 3. Hierarchical Ordering of Propositions

The next step of theory analysis is the hierarchical ordering of propositions into sets. According to Fawcett and Downs (1992), hierarchical ordering of propositions can be arranged by either level of abstraction or deductive reasoning. Arranging propositions according to level of abstraction is done by identifying the abstract proposition and moving to more concrete propositions. Arranging propositions by deductive reasoning requires that empirical indicators be specified. Because this theory does not provide concrete propositions or empirical indicators, constructing hierarchical ordering of propositions into sets is not possible.

### 4. Diagram of the theory

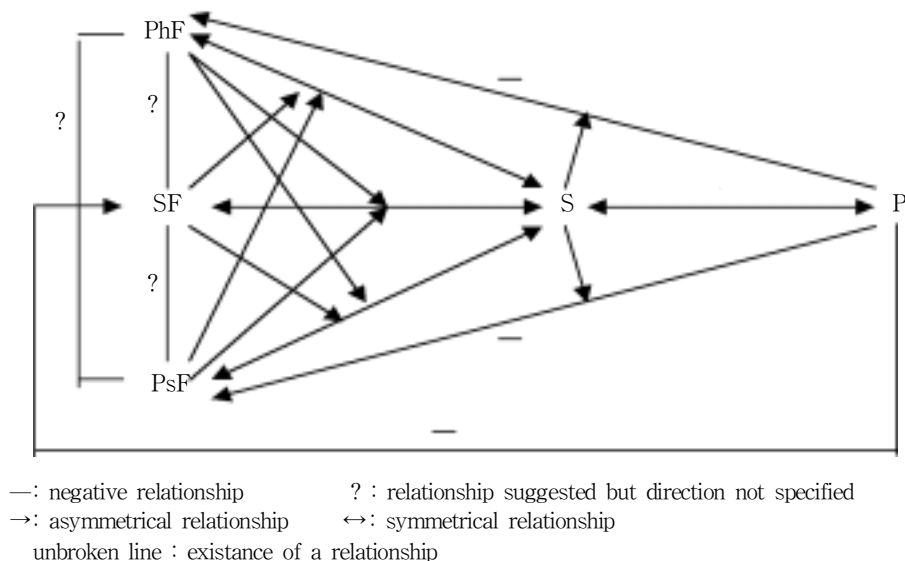


Figure 8. Conceptual Map of the Thoery of Unpleasant Symptoms

The final step in theory analysis is construction of a diagram of the theory. A diagram helps to determine how all the concepts and propositions of the theory are brought together (Fawcett & Downs, 1992). Figure 8 is a conceptual map developed from the concepts and relational propositions in the TOUS.

## Evaluation

### 1. Significance

Significance criteria include two requirements: theoretical and social significance. Theoretical significance is evident when the theory addresses a phenomenon of interest to a discipline by expanding or filling in knowledge about that phenomenon. Social significance is evident when a theory addresses a problem of particular interest to society (Fawcett, 1999; Fawcett & Dawns, 1992).

The TOUS meets the criterion of theoretical significance. The authors of the TOUS implied that the theory provides knowledge about the commonality among symptoms while symptom-specific theories are too restrictive to be the sole focus of knowledge development. The TOUS also

provides knowledge about the complexities of the interaction effects, reciprocal relationships, and mediation effects among physiological, psychological, and situational factors, symptoms, and performance.

Symptoms are major causes for which people seek care from health professionals who are responsible for the management of symptoms experienced by the people. Therefore, the theory is of interest to both people and health professionals and thus, meets the criteria of social significance.

## 2. Internal Consistency

Internal consistency criterion includes three major requirements: semantic clarity, semantic consistency, and structural consistency (Fawcett & Downs, 1992). Semantic clarity requires that concepts be clearly defined and not be redundant. Semantic consistency requires that the theory use the same concept terms and definitions throughout the narrative presentation of the theory. Structural consistency requires that propositions be complete, not redundant, and logical.

Lack of semantic clarity is evident in the TOUS. In the theory symptoms are defined as having four dimensions: intensity (strength or severity), timing (duration and frequency of occurrence), distress (degree of discomfort or bothersomeness), and quality. However, in the statement "(physiological, psychological, and situational factors) are identified as influencing the occurrence, intensity, timing, distress level, and quality of symptoms (p.18)," symptoms are classified in five parts since the terms, occurrence and timing, present the same dimension of symptoms, they are redundant.

Lack of semantic consistency is also evident throughout the narrative report. The terms, symptoms and symptom experience, functional activities and functional performance, and physiological and psychological factors and physiological and psychological statuses/conditions, are used interchangeably.

Also a lack of structural consistency is evident in the relationship among physiological, psychological, and situational factors. Proposition 2

suggests non-direction-specified existence of a relationship among the three factors. However, the authors often explain the non-direction-specified existence of the relationship among the three factors as if they were symmetric relationships.

## 3. Parsimony

Parsimony requires that a theory be stated in the most economical way possible without oversimplifying the theory. Formulation of the TOUS indicates that the theory meets the criterion of parsimony: With five concepts and seven relational propositions, the TOUS is fully explained. However, the above-mentioned redundancy, interchangeable use of terms, and structural inconsistency should have been avoided.

## 4. Testability

The testability criterion requires that the concepts of a theory be empirically observable. Concepts are empirically observable if they are connected to empirical indicators by operational definitions. The TOUS is not testable because operational definitions were not identified in the theory. However, the authors provide guidelines the most appropriate measurement for symptoms: multidimensional and multifactorial measurement for symptoms.

Based upon the TOUS, Kim (1999) developed an instrument measuring three dimensions (frequency, intensity, distress) of four symptoms (shortness of breath, coughing, wheezing, chest tightness) of patients with asthma (N = 154). The instrument consists of 12 items and Cronbach's alpha was .94. Face validity of the instrument was established by three pulmonary nurse experts; however, construct validity was not tested. Thus, for further development, empirical indicators measuring symptoms of patients with asthma should be tested for the multifactorial nature of the symptoms.

The Symptom Experience Scale (SES) (Samarel et al., 1996) was not developed based upon the TOUS. However, the SES was designed to measure women's experience of symptoms

associated with treatment for breast cancer: frequency, intensity, and distress of eight common symptoms. Cronbach's alpha coefficient for internal consistency reliability of the SES was reported as .94 and initial construct validity was established. In the study with women with breast cancer (Leddy, 1997), Cronbach's alpha of the SES was .90. Thus, the SES may be used as the empirical indicator of symptom experience of the TOUS.

### 5. Evaluation of Empirical Adequacy

Evaluation of empirical adequacy is determined by examining results of empirical studies using the theory to see whether results of the studies support or refute the assertions of the theory. Two empirical studies using the TOUS were identified in the literature. One is a qualitative study by Hutchinson and Wilson (1998) to evaluate the fit of the TOUS for patients with Alzheimer's disease. The investigators in this study observed and interviewed dementia patients, their families, and staff members. They reported that while the TOUS can indeed be extended to improve the thoroughness of assessment in client with Alzheimer disease, the boundaries of the components of symptoms, physiologic, psychologic, and situational factors, and performance are blurred and often overlap. That is, the components of the theory are not mutually exclusive when the theory is applied to clients with Alzheimer disease. Regarding these results, Lenz and Gift (1998) pointed out the following main reasons in the study that lead to the results. First, though symptoms are characterized as subjective in the TOUS, Hutchinson and Wilson (1998) treated both the subjective symptoms and the objectively observable signs of Alzheimer disease as subjective symptoms. Second, since the TOUS is applicable to populations who can describe and explain their symptom-related experience, it may not be appropriate to use the TOUS as a basis for practice with populations who cannot describe their symptoms, such as clients with Alzheimer disease.

The other study was a quantitative study. Kim (1999) conducted a study on symptom

experience, functions, and quality of life in people with asthma. The study was based upon Ferrans' (1996) framework of life satisfaction and the TOUS (Lenz et al., 1997). In the study the proposition about the influence of symptoms on performance from the TOUS was tested. The results showed that symptom distress influences functional performance. Therefore, the study partially supported the TOUS.

### 6. Evaluation of Pragmatic Adequacy

Evaluation of pragmatic adequacy is determined by assessing educational preparation to adequately use a theory and ascertaining the appropriate clinical area for using the theory. Educational preparation of nurses to implement the TOUS successfully was not mentioned by Lenz and her colleagues in the TOUS. However, Lenz & Gift (1998) in another article noted that since nursing education programs have tended to isolate theory from practice, generally nurses have not been educated to practice from a middle-range theory base. Thus, it is required that the TOUS be included in educational curricula of schools of nursing to prepare for nurses to use the TOUS in nursing care for patients experiencing symptoms.

Since the TOUS is not disease- or clinical population-specific, Lenz et al. (1997) noted that the TOUS is applicable in various clinical populations, such as pregnant women, new mothers, and patients with chronic obstructive pulmonary disease, cancer or cardiac disease. However, since the TOUS is concerned with the nature of the subjective experience of symptoms, there are limitations to the use of the theory in populations which have perceptual or sensory limitations, such as comatose patients, patients with problems of neurotransmission, and infants, who cannot describe their symptoms (Lenz & Gift, 1998).

The TOUS guides nurses to see the complexities of symptoms, such as the synergistic impact of the interaction of influencing factors on combinations of symptoms and reciprocal or feedback influences of performance factors on both symptoms and influencing factors etc. Thus, the theory helps nurses to seek new ways

to intervene for patients experiencing symptoms.

## Conclusion

The results of the analysis and evaluation of the TOUS provide directions for future theoretical work needed to enhance the use of theory in research and clinical practice. The TOUS has theoretical and social significance and parsimony. However, lack of internal consistency was evident. For semantic clarity, it is recommended that the redundant use of the terms of occurrence and timing be deleted. For semantic consistency, the terms, such as symptoms and symptom experience, functional activities and functional performance, and physiological and psychological factors and physiological and psychological statuses/conditions should not be used interchangeably. And it would be better in proposition 3 about the relationships among physiological, psychological, and situational factors if it was clearly explicated whether the relationships are of symmetry or existence.

Even though Lenz and her colleagues (1997) did not suggest exact empirical indicators measuring symptoms, they suggested an appropriate instrument measuring symptoms should be multidimensional and multifactorial. Thus, it is recommended that the development of an instrument include conceptual mapping of multidimension and multifactor symptoms.

Also, it is recommended that research be conducted to examine the complexities of the interaction effects, reciprocal relationships, and medication effects among physiological, psychological, and situational factors, symptoms, and performance. The knowledge derived from the research findings should be used in practice for patients experiencing symptoms.

## References

- Cohen, J. & Cohen, P. (1983). Applied multiple regression/correlation analysis for the behavioral sciences (2nd. ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Fawcett, J. (1993). Analysis and evaluation of nursing theories. Philadelphia: F. A. Davis.
- Fawcett, J. (1999). The relationship of theory and research (3rd ed.). Philadelphia: F. A. Davis.
- Fawcett, J. & Downs, F.S. (1992). The relationship of theory and research (2nd ed.). Philadelphia: F. A. Davis.
- Ferrans, C.E. (1996). Development of a conceptual model of quality of life. Scholarly Inquiry for Nursing Practice, 10, 293-304.
- Gift, A.G. (1990). Dyspnea. Nursing Clinics of North America, 25, 955-965.
- Gift, A.G. & Cahill, C. (1990). Psychophysiological aspects of dyspnea in chronic obstructive pulmonary disease: A pilot study. Heart and Lung, 19, 252-257.
- Gift, A.G. & Pugh, L.C. (1993). Dyspnea and fatigue. Nursing Clinics of North America, 28, 373-384.
- Hutchison, S. & Wilson, H.S. (1998). The theory of unpleasant symptoms and Alzheimer's disease. Scholarly Inquiry for Nursing Practice: An International Journal, 12, 143-158.
- Jaccard, J., Turrisi, R. & Wan, C. (1990). Interaction effects in multiple regression. Newbury Park, CA: Sage.
- Kim, E-G. O. (1999). Symptom experience, functioning, and quality of life in people with asthma. Unpublished doctoral dissertation, University of Illinois, Chicago.
- Leddy, S.K. (1997). Healthiness, fatigue and symptom experience in women with and without breast cancer. Holistic Nursing Practice, 12, 48-53.
- Lenz, E.R. & Gift, A.G. (1998). Response to the theory of unpleasant symptoms and Alzheimer's disease. Scholarly Inquiry for Nursing Practice: An International Journal, 12, 159-162.
- Lenz, E.R., Pugh, L.C., Milligan, R.A., Gift, A., & Suppe, F. (1997). The middle-range theory of unpleasant symptoms: An update. Advanced Nursing Science, 19(3), 14-27.
- Lenz, E.R., Suppe, F., Gift, A.G. Pugh, L.C. & Milligan, R.A. (1995). Collaborative development of middle-range nursing theories: Toward a theory of unpleasant symptoms. Advanced Nursing Science, 17(3), 1-13.
- Milligan, R.A. (1989). Maternal fatigue during the first three months of the postpartum period.



- Dissertation Abstract International, 50, 07-B.
- Pugh, L.C. (1990). Psychophysiologic correlates of fatigue during childbearing. Dissertation Abstract International, 51, 01-B.
- Pugh, L.C. & Milligan, R.A. (1993). A framework for the study of childbearing fatigue. Advanced Nursing Science, 15, 60-70.
- Samarel, N., Leddy, S.K., Greco, K., Cooley, M.E., Torres, S.C., Tulman, L., & Fawcett, J. (1996). Development and testing of the Symptom Experience Scale. Journal of Pain and Symptom Management, 12, 221-228.
- Walker, E.A., & Avant, K.C. (1995). Strategies for theory construction in nursing (3rd. ed.). Norwalk, CT: Appleton & Lange.