

# Evaluating Research for Evidence-Based Nursing Practice

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# Research and Nursing Research

**Research** is a formal, systematic, and rigorous process of inquiry used to generate and test theories

**Nursing research** is a formal, systematic, and rigorous process of inquiry used to generate and test theories about the health-related experiences of human beings within their environments and about the actions and processes nurses use in practice

**The product of research is always a theory**

# Evidenced-Based Practice

Evidence-based practice is the deliberate and critical use of theories about human beings' health-related experience to guide actions associated with each step of the nursing process

- Assessment
- Planning
- Intervention
- Evaluation

# Research, Theory, Evidence, and Practice

- Research = Theory development
- Theory = Evidence
- Practice = Research
  
- Evidence-based practice = Theory-based practice

# Conceptual Models, Theories, and Research Methods

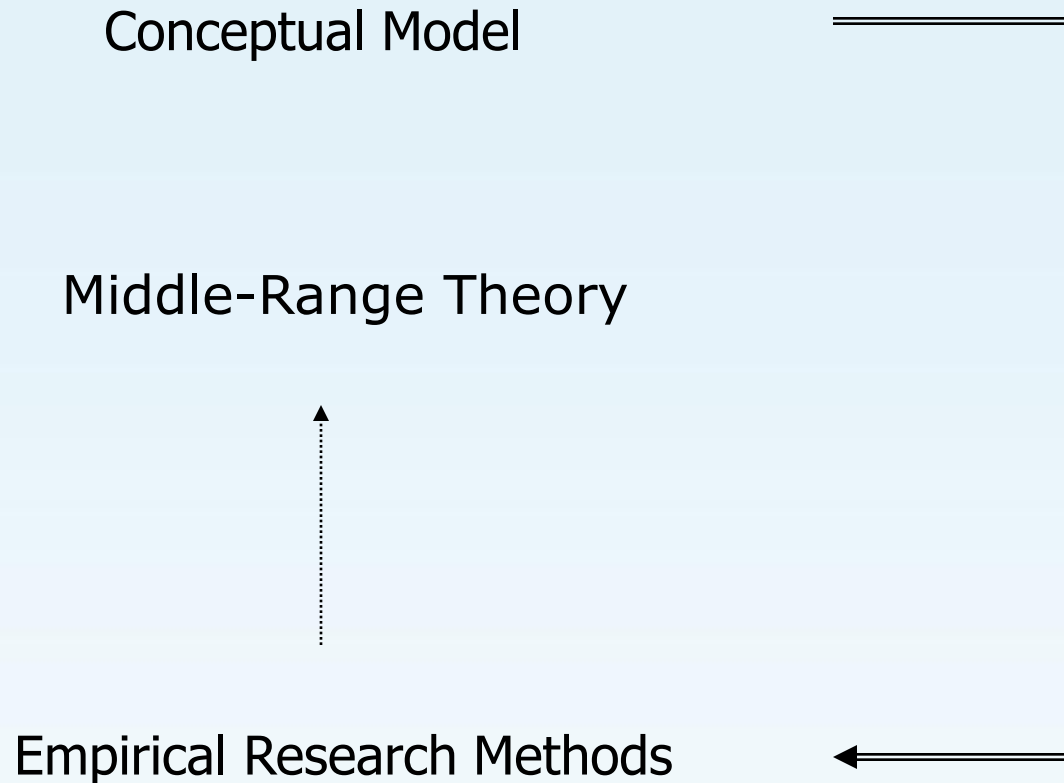
- Research always is based on a conceptual model
- Research always focuses on generation or testing of a theory
  - Qualitative research always is theory-generating
  - Quantitative research may be theory-generating but usually is theory-testing
- Research always is conducted using research methods

# Three Components of Research: Conceptual Models, Theories, and Research Methods

## Conceptual-Theoretical-Empirical Structures for Research

- C = Conceptual model that guides the research
- T = Middle-range theory that is generated or tested
- E = Empirical research methods used to conduct the research

# Conceptual-Theoretical-Empirical Structure for *Theory-Generating* Research: From Conceptual Model to Empirical Research Methods to Middle-Range Theory



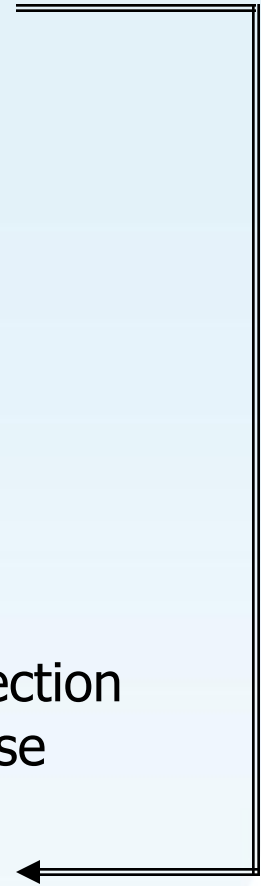
# Example: Basic Conceptual-Theoretical-Empirical Structure for Study of Responses to Caring for a Family Member with Alzheimer's Disease

King's Conceptual System

Theory of Rewards of Caregiving



Descriptive research design with cross-sectional data collection  
Caregivers of a family member with Alzheimer's disease  
Caregiver Rewards Interview Guide  
Content analysis





# Conceptual-Theoretical-Empirical Structure for *Theory-Testing* Research: From Conceptual Model to Middle-Range Theory to Empirical Research Methods

Conceptual Model



Middle-Range Theory



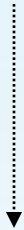
Empirical Research Methods

# Example: Basic Conceptual-Theoretical-Empirical Structure for Study of Women's Adaptation During Childbearing

Roy's Adaptation Model



Theory of Adaptation During Childbearing



Correlational research design with longitudinal data collection  
Women in each trimester of pregnancy  
and 3 and 6 weeks and 3 and 6 months postpartum  
BDS, SC, PES, PNSQ, PSQ, IFSAP, IFSAC, ICQ  
Correlational statistics

# A Six Step Framework for Evaluating Conceptual-Theoretical-Empirical Structures for Research

Step One: Evaluation of the Conceptual-Theoretical-Empirical Linkages

Step Two: Evaluation of the Middle-Range Theory

Step Three: Evaluation of the Empirical Research Methods

# A Six Step Framework for Evaluating Conceptual-Theoretical-Empirical Structures for Research

Step Four: Evaluation of the Research Findings

Step Five: Evaluation of the Utility of the Theory for Practice

Step Six: Evaluation of the Utility and Soundness of the Conceptual Model

# Step One: Evaluation of the Conceptual-Theoretical-Empirical Linkages

## **Specification adequacy** is evident

- Refers to the amount of information about the conceptual model given in the research report
- ✓ The conceptual model that guided the research is explicitly identified
- ✓ A clear and concise overview of the content of the conceptual model is given
- ✓ The connection between the conceptual model and the research topic explained
- Look in the background or conceptual framework subsection of the introduction section of the research report for the information

## Example of Specification Adequacy: Qualitative Theory-Generating Study— Living with Multiple Sclerosis

“The Roy adaptation model (Roy, 1983; Roy & Andrews, 1999) focuses on how individuals adapt to constantly changing environmental stimuli. Adaptation is regarded as ‘the process and outcome whereby thinking and feeling persons . . . use conscious awareness and choice to create human and environmental integration’ (Roy & Andrews, 1999, p. 30). Environmental stimuli are channeled through a physiologically based regulator coping mechanism and a psychologically based cognator coping mechanism and are manifested in four modes of adaptation: physiological, self-concept, role function, and interdependence (Roy & Andrews, 1999).”

## Example of Specification Adequacy: Quantitative Theory-Testing Study— Correlates of Glycemic Control

“Most researchers have clearly stated that self-efficacy and self-care agency influence an individual’s performance of diabetes self-care management activities, which in turn affects glycemic control. To test this hypothesis, a research model ...was designed. The enhance-behavior-performance model (Sousa, 2003), which synthesizes Orem’s (1995) Theory of Self-Care and Bandura’s (1997) Self-Efficacy Theory into a conceptual framework for chronic disease management, and the literature review supporting the relationships among the [study] variables of interest ..., served as the basis for the development of the research model for this study. Concepts of self-care agency, self-efficacy, self-care, self-care activities, behaviors, and health outcome were integrated.

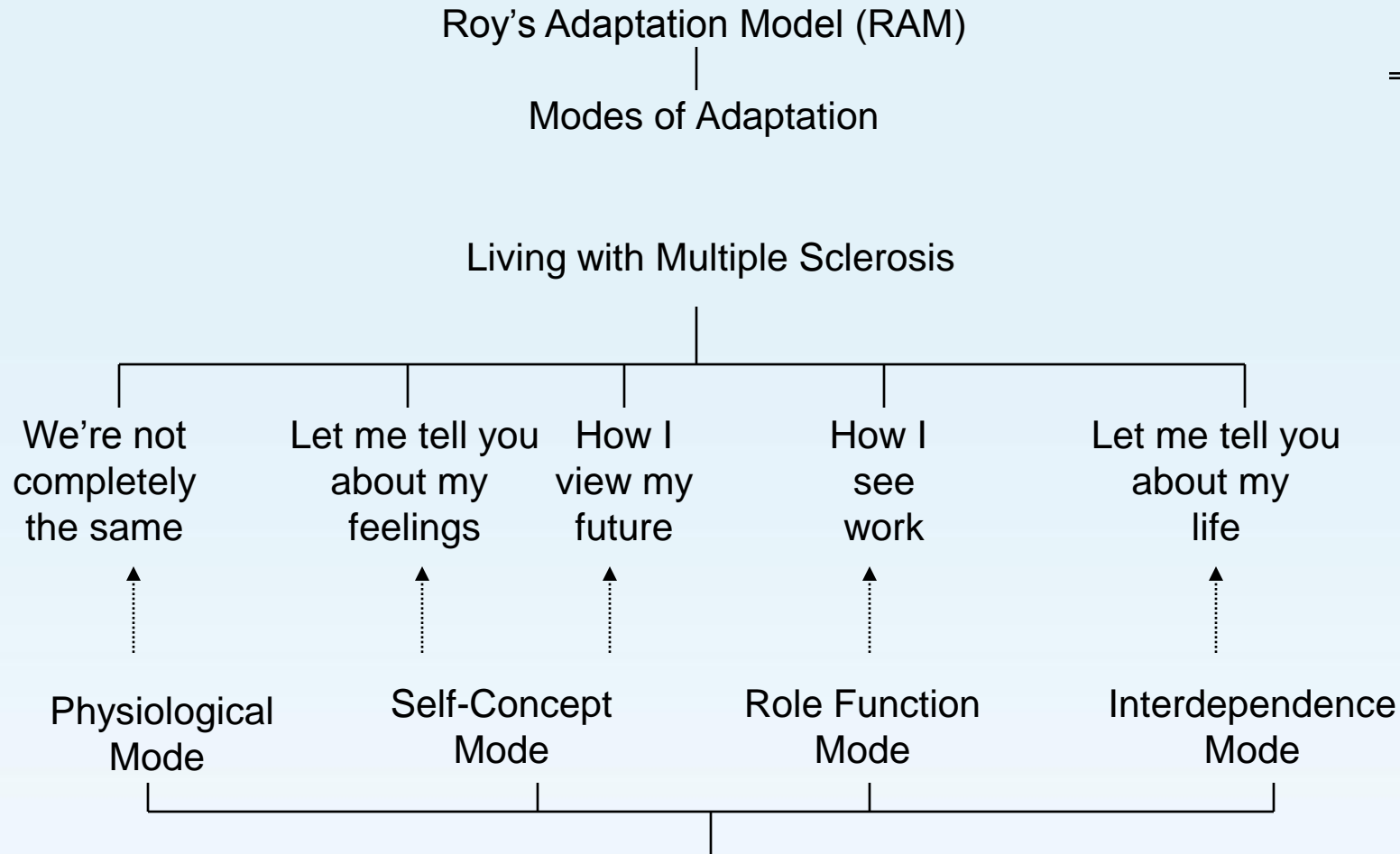
# Step One: Evaluation of the Conceptual-Theoretical-Empirical Linkages

## Linkage adequacy is evident

- Refers to the amount of information about the connections between the conceptual model, the middle-range theory, and the empirical research methods given in the research report
- ✓ The connections between the conceptual model, middle-range theory, and empirical research methods are stated explicitly
- ✓ The connections between the conceptual model, middle-range theory, and empirical research methods are complete
- ✓ The empirical research methods are congruent with the conceptual model
- Look in the background or conceptual framework subsection of the introduction section of the research report for the information

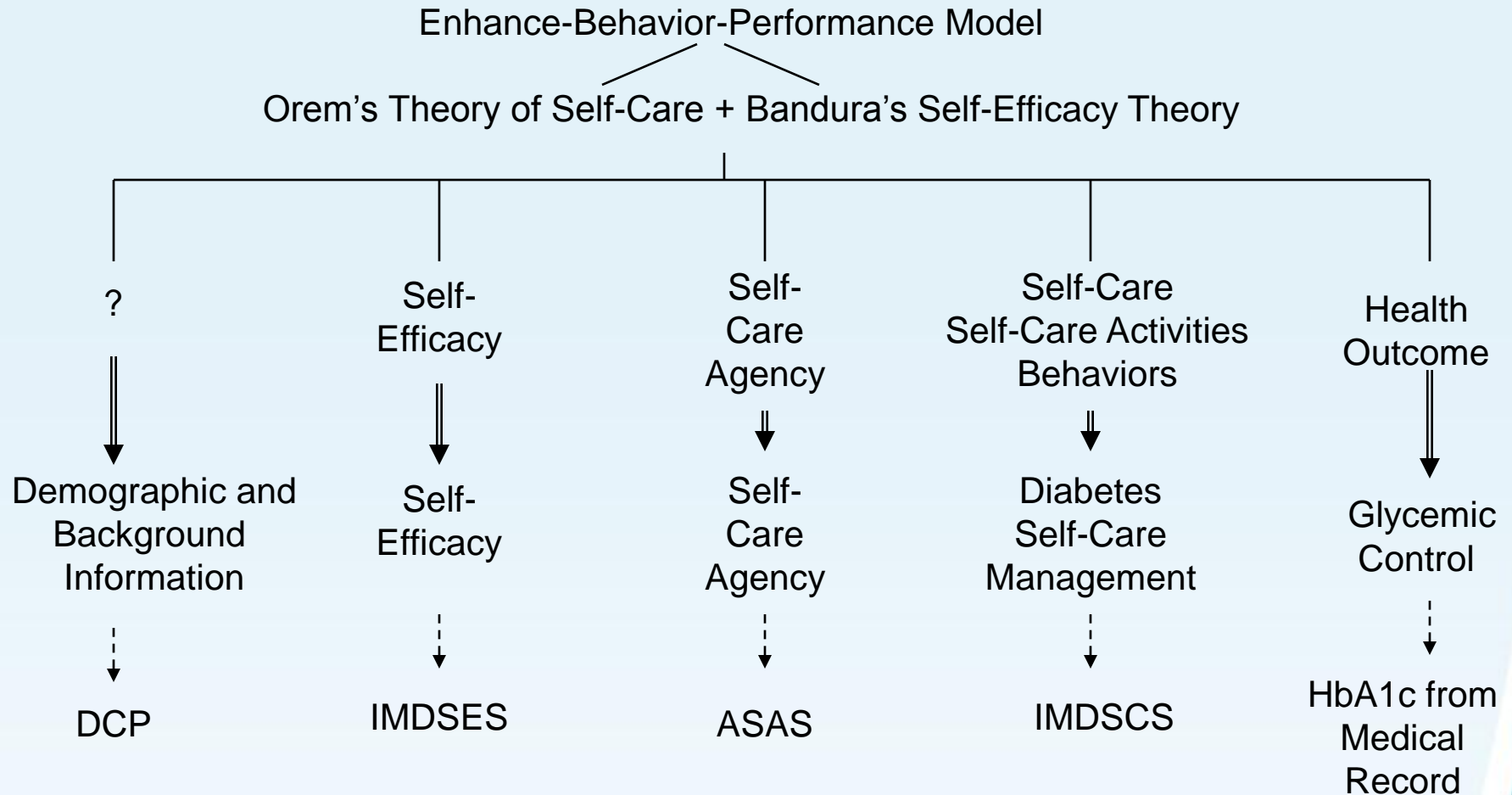


# Example of Linkage Adequacy: Qualitative Theory-Generating Study



Content Analysis—Themes Classified According to RAM Modes of Adaptation  
Naturalistic Case Study Design 9 Men and 9 Women with Multiple Sclerosis  
Longitudinal Data Collection--Three Telephone and/or In-Person Interviews

# Example of Linkage Adequacy: Quantitative Theory-Testing Study



Correlational Design – Path Model with Cross-Sectional Data Collection

141 Adults with Type 1 or Type 2 Diabetes

Descriptive and Correlational Statistics, including Hierarchical Linear Regression

## Step Two: Evaluation of the Middle-Range Theory

### The theory is **significant**

- Refers to the extent of social and theoretical importance of the theory
- ✓ Social significance: The theory should address a topic that is of practical importance to society.
- ✓ Theoretical significance: The theory should offer new insights about the topic
- Look in the introduction section of the research report for the information

# Example of Significance: Qualitative Theory-Generating Study

## ■ **Social significance**

“I also am one of the approximately 250,000 to 350,000 people who have multiple sclerosis (MS).”

# Example of Significance: Qualitative Theory-Generating Study

## ■ Theoretical significance

The literature review yielded increased understanding of the broad array of physical and psychosocial symptoms experienced by people with MS. The literature did not, however, provide sufficient information about how people live with MS. Thus, the current study augments what is known about living with MS. A clearer understanding of what it is like to live with MS may enable healthcare workers to promote adaptive responses in each Roy model mode of adaptation, despite the limitations imposed by the disease, and thereby enhance the quality of life for people with MS.”

# Example of Significance: Quantitative Theory-Testing Study

## ▪ **Social significance**

“According to the Centers for Disease Control (CDC), diabetes mellitus affects approximately 17 million people in the United States (CDC, 2002). IT is the sixth leading cause of death and a major cause of complications of the cardiovascular, renal, ocular, and nervous systems (Expert Committee on the diagnosis and Classification of Diabetes Mellitus, 2000). The annual economic cost of managing these disease related complications was \$132 billion in 2002 (CDC, 2002).”

# Example of Significance: Quantitative Theory-Testing Study

## ■ **Theoretical significance**

“Costly complications of diabetes often arise from poor glycemic control. Appropriate diabetes self-care management may improve control. This study examined whether self-care management affects glycemic control and mediates relationships between self-efficacy and self-care agency with glycemic control.”

# Example of Significance: Quantitative Theory-Testing Study

- **Theoretical significance**

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## Step Two: Evaluation of the Middle-Range Theory

### The theory is **internally consistent**

- Refers to the extent to which the theory is comprehensible
- ✓ The concepts should be explicitly identified and clearly defined
- ✓ The same term and the same definition should be used for each concept throughout the research report
- ✓ The propositions should be reasonable –  
inductive or deductive reasoning is evident
- Look in all sections of the research report for the information

## Example of Internal Consistency: Qualitative Theory-Generating Study

- The middle-range theory concept of living with multiple sclerosis and the five concept dimensions (the five themes) were clearly identified and described
- The same terms were used throughout the research report for all five themes identified in the data
- Inductive reasoning is evident – summaries of participants' responses and some verbatim quotations from participants were given, which supported the five themes

## Example of Internal Consistency: Quantitative Theory-Testing Study

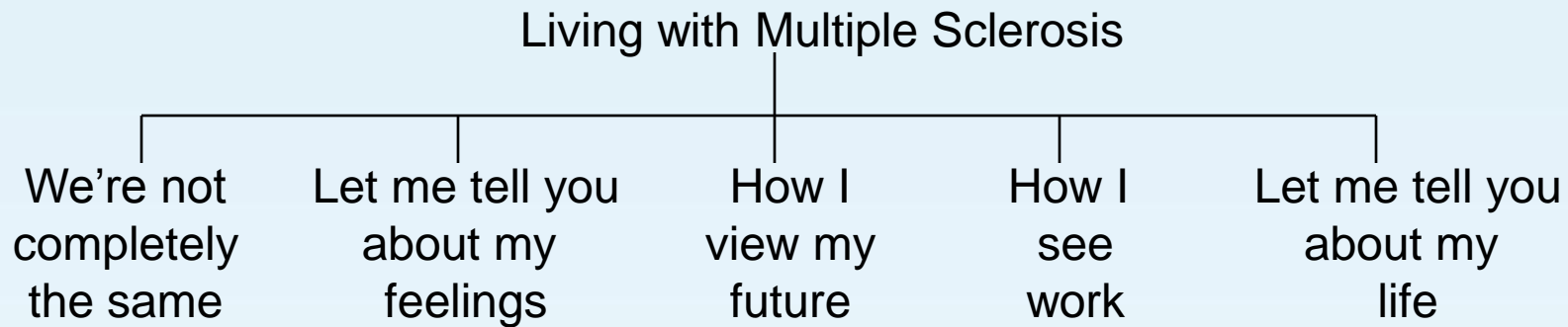
- All major middle-range theory concepts – self-efficacy, self-care agency, diabetes self-care management, glycemic control, demographic variables -- were clearly identified and defined; demographic variables were identified but were not defined
- The same terms were used throughout the research report for the theory concepts with one exception--health status/self-rated health--**but** no distinction was made between the conceptual model concepts and the theory concepts of self-efficacy and self-care agency
- Deductive reasoning is evident – the theory was deduced from the conceptual model and the literature

## Step Two: Evaluation of the Middle-Range Theory

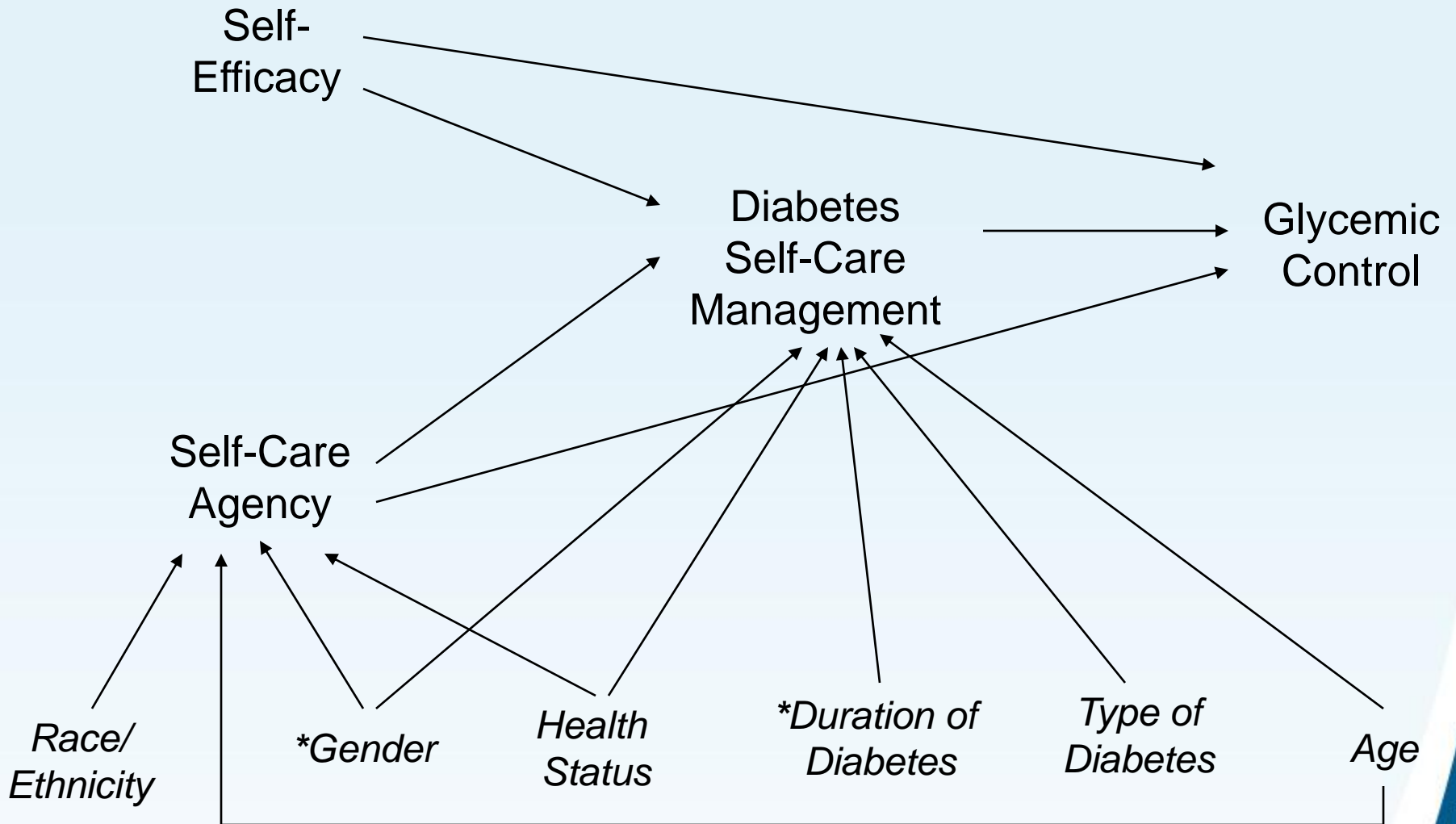
The theory is **parsimonious**

- Refers to the extent to which the theory is stated as concisely as possible
- ✓ The theory should be made up of as few concepts and propositions as necessary to convey its meaning
- Look in the introduction, results, and discussion sections of the research report for the information

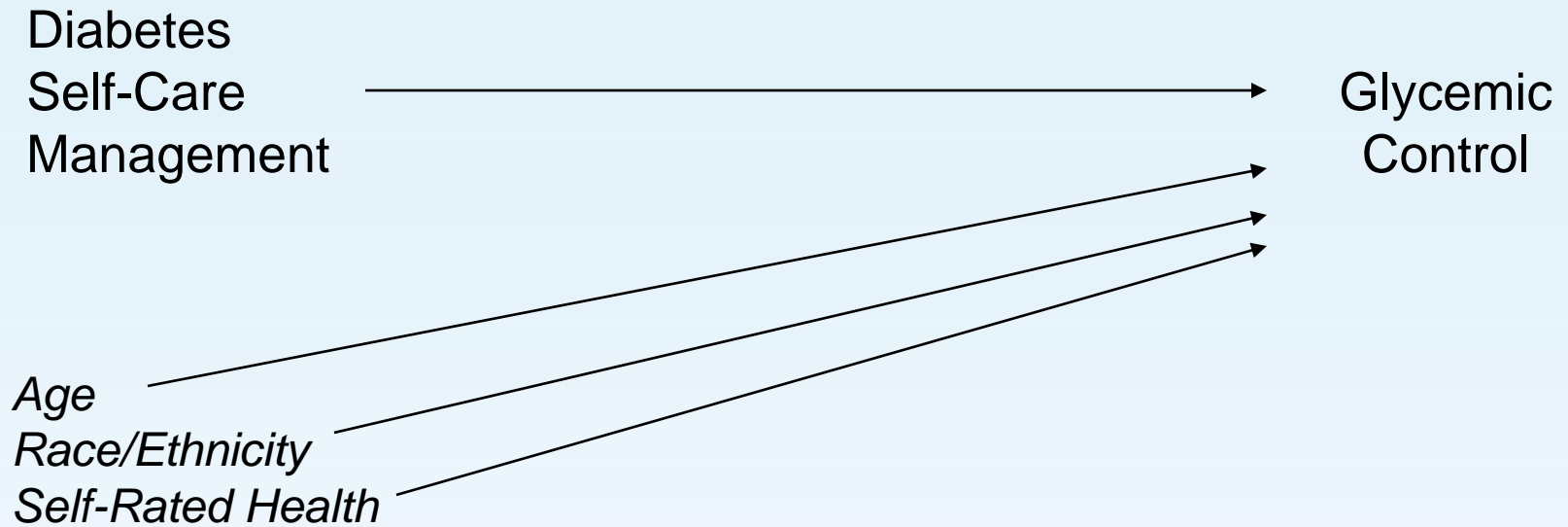
## Example of Parsimony: Qualitative Theory-Generating Study



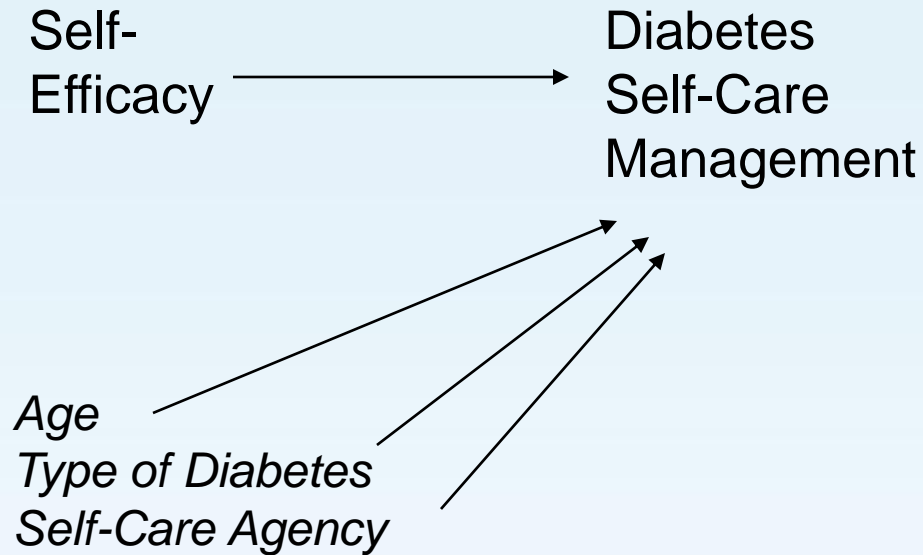
# Example of Parsimony: Quantitative Theory-Testing Study-- The Theory Before Testing



## Example of Parsimony: Quantitative Theory-Testing Study-- The Theory After Testing (Diabetes Self-Care Management)

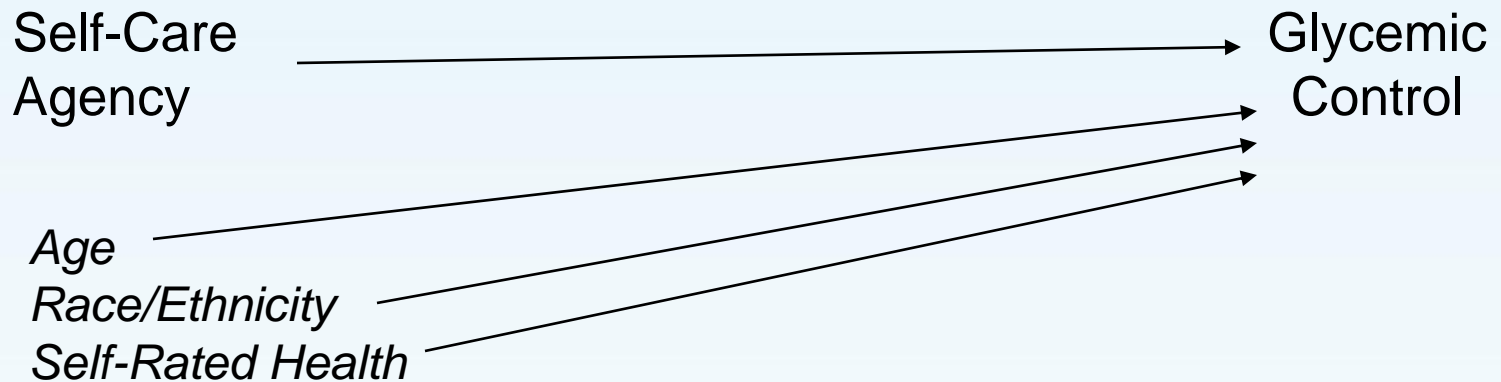
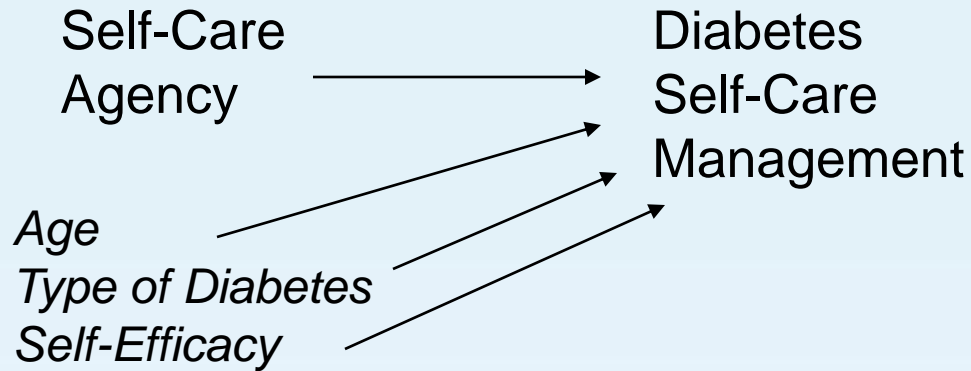


# Example of Parsimony: Quantitative Theory-Testing Study-- The Theory After Testing (Self-Efficacy)





# Example of Parsimony: Quantitative Theory-Testing Study-- The Theory After Testing (Self-Care Agency)

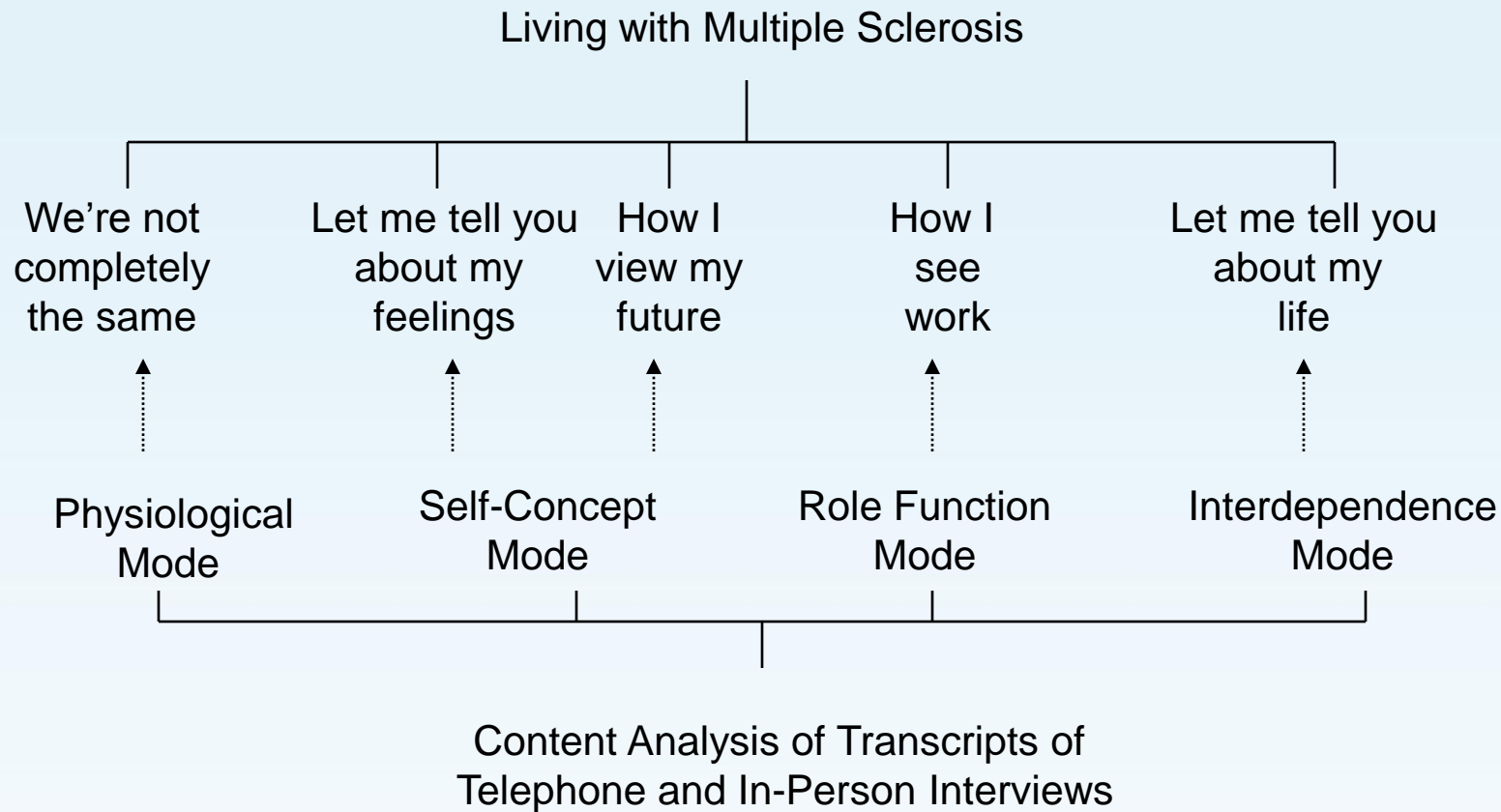


## Step Two: Evaluation of the Middle-Range Theory

The theory is **testable**

- Refers to the extent to which the theory can be tested empirically
- ✓ All concepts should be measured
- ✓ All assertions should be testable through some data analysis technique
- Look in the method and results sections for the information

# Example of Testability: Qualitative Theory-Generating Study



# Example of Testability: Quantitative Theory-Testing Study



Hierarchical Linear Regression Statistics

# Step Three: Evaluation of the Empirical Research Methods

## **Operational adequacy** is evident

- Refers to the amount of information about the empirical research methods given in the research report and to the appropriateness of the methods used
- ✓ The methods used to conduct the research—research design, sample, instruments and any experimental conditions, procedures for data collection and protecting participants from harm, data analysis techniques—should be clearly described and should be appropriate
- Look in the method and results sections of the research report for the information

# Example of Empirical Research Methods: Qualitative Theory-Generating Study

- **Research design** -- Naturalistic case study design
- **Sample** – Data saturation justified a sample size of 9 men and 9 women. Participants had Multiple Sclerosis and were affiliated with the National Multiple Sclerosis Society
- **Instruments** – Three guided conversations interview schedules
- **Procedure for data collection:** Longitudinal data collection—  
Three telephone and/or in-person interviews
- **Procedures for protection of study participants** – Signed consent form mentioned **but** no indication of IRB approval

# Example of Empirical Research Methods: Qualitative Theory-Generating Study

- **Data analysis techniques** -- Content analysis
- “Bracketing was facilitated by conversations between the first author and her coauthors about the grief and losses of living with the disease as they discussed codes and emergent themes.”
- “Credibility of the data analysis was established by continuously confirming results until they accounted for all participants’ responses. ... To help reduce bias, portions of the logs and analytic memos were coded by an external auditor and compared with the first author’s codes. ... The external auditor and first author achieved 95% agreement on the codes and themes. Participants also helped to clarify, confirm, and disconfirm findings. ... Furthermore, the first author’s education and training as a clinical specialist in psychiatric nursing made her more aware of feelings, mannerisms, posture, tone of voice, values, and ideas that may influence interviews, data, and analysis. In addition, her diagnosis of MS facilitated her rapport with study participants.”

# Example of Empirical Research Methods: Quantitative Theory-Testing Study

- **Research design** – Correlational, path model
- **Sample** – Power analysis justified a sample size of 141 adults.  
Participants had to be adults 40 years of age or older who had with insulin injection-requiring type 1 or 2 diabetes mellitus of 6 months or more duration, and who “could read, write, and understand English.”
- **Instruments** – Paper and pencil fixed choice questionnaires  
Internal consistency reliability coefficients from previous studies for the ASAS, IMDSES, IMDSCS **but** no data for the study sample  
Validity – Content validity for the ASAS, IMDSES, IMDSCS  
Precision and accuracy for HbA1c, which is considered the “gold standard” for measuring long-term glycemic control  
No psychometric properties given for the DCP



## Example of Empirical Research Methods: Quantitative Theory-Testing Study

- **Procedure for data collection** – Cross-sectional data collection
- **Procedures for protection of study participants** – IRB approval mentioned **but** no indication of informed consent

# Example of Empirical Research Methods: Quantitative Theory-Testing Study

## **Data analysis techniques** – Descriptive and correlational statistics

“The Statistical Package for Social Sciences (SPSS) version 10.0 was used to analyze the data. Descriptive statistical analysis was performed to characterize the sample and major study variables. Pearson’s correlations were also performed to exam[in]e the relationship between and among major study variables. Hierarchical multiple regression analyses were then conducted to answer the study specific research questions. ... Variables whose types were nominal and ordinal were recoded as dummy variables ... before testing them in a regression model. An overall analysis of the assumptions for multiple regression was performed. Results of that analysis suggested that violation of the assumptions of regression was not a concern.”

## Step Four: Evaluation of the Research Findings

Information regarding the **empirical adequacy** of the middle-range theory is given

- Refers to the extent to which the data agree with the theory.
- ✓ The concepts and propositions of the theory should be congruent with the research findings
- Look in the results and discussion sections of the research report for the information

## Example of Empirical Adequacy: Qualitative Theory-Generating Study

### Living with Multiple Sclerosis

We're not  
completely  
the same

Let me tell you  
about my  
feelings

How I  
view my  
future

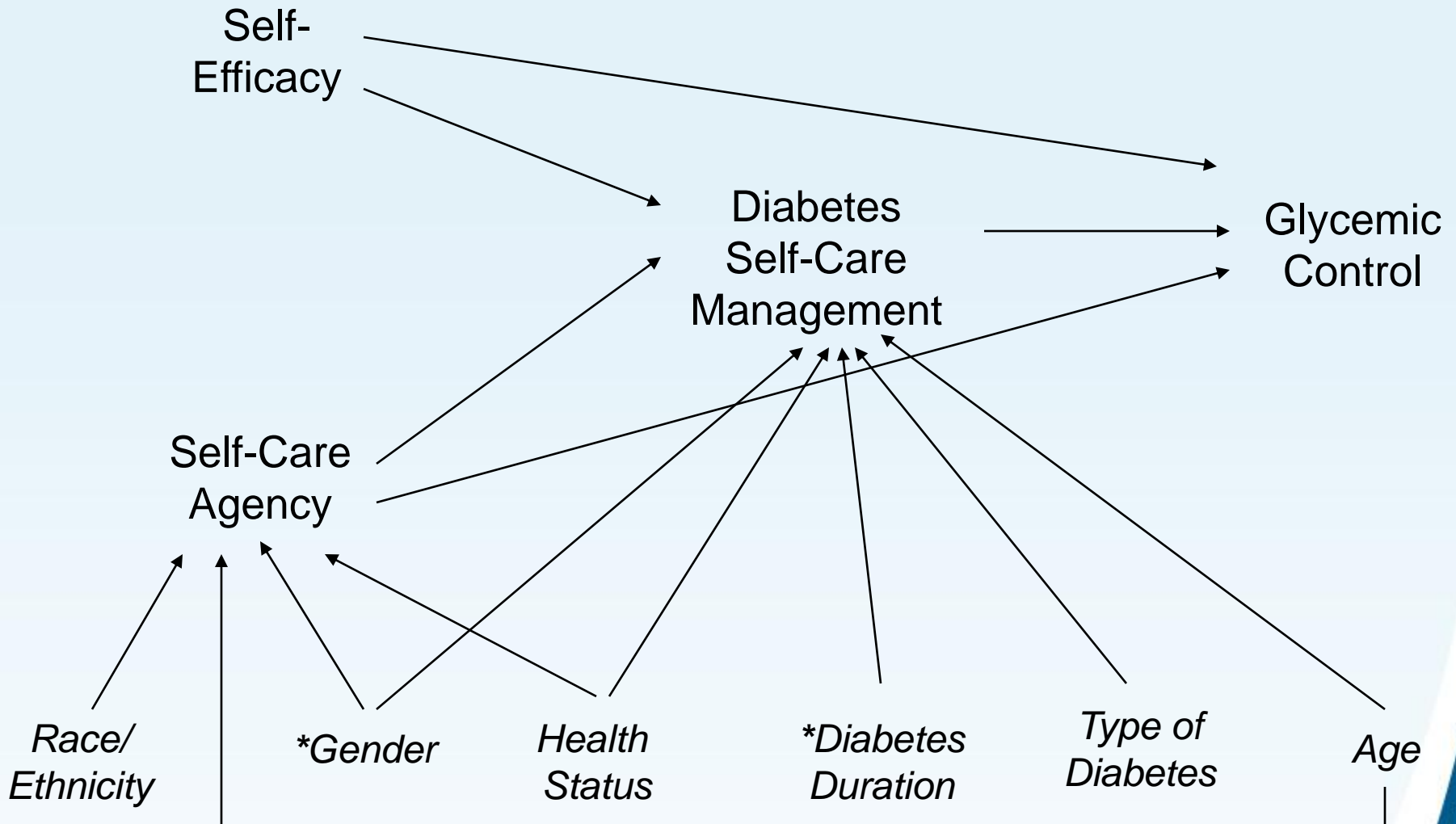
How I  
see  
work

Let me tell you  
about my  
life

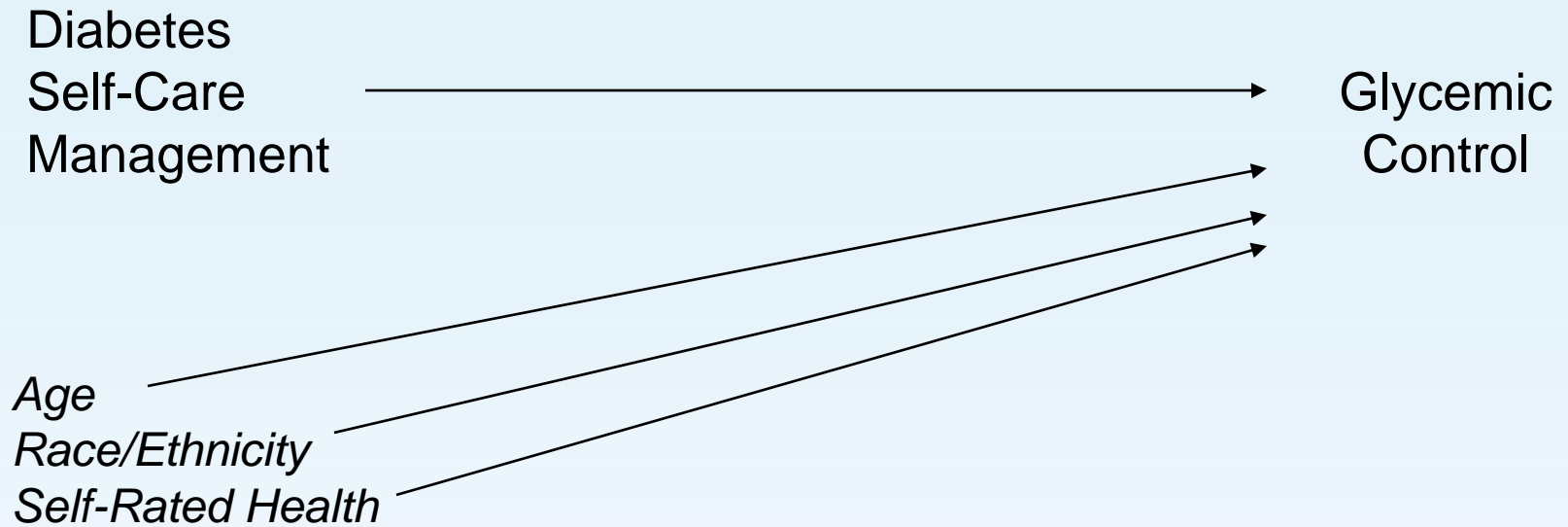
## Example of Empirical Adequacy: Quantitative Theory-Testing Study

“This study examined whether individuals’ performance of diabetes self-care affected their glycemic control, and whether performance of self-care activities (diabetes self-care management) mediated the relationships between self-efficacy and glycemic control and between self-care agency and glycemic control. We found that individuals’ performance of diabetes self-care activities affected their glycemic control, although this effect was not robust and it disappeared with either self-care or self-efficacy was included in the model. ... The findings of this study suggest that individuals who have greater self-care agency and self-efficacy also have better diabetes self-care management, which in turn leads to better glycemic control. No mediating effects of diabetes self-care management between self-efficacy and glycemic control or between self-care agency and glycemic control were demonstrated. Thus, the findings from the test of the study research model support the hypothesis that beliefs or capabilities for self-care are not sufficient to improve glycemic control; one must engage in actual self-care activities to achieve better glycemic control.”

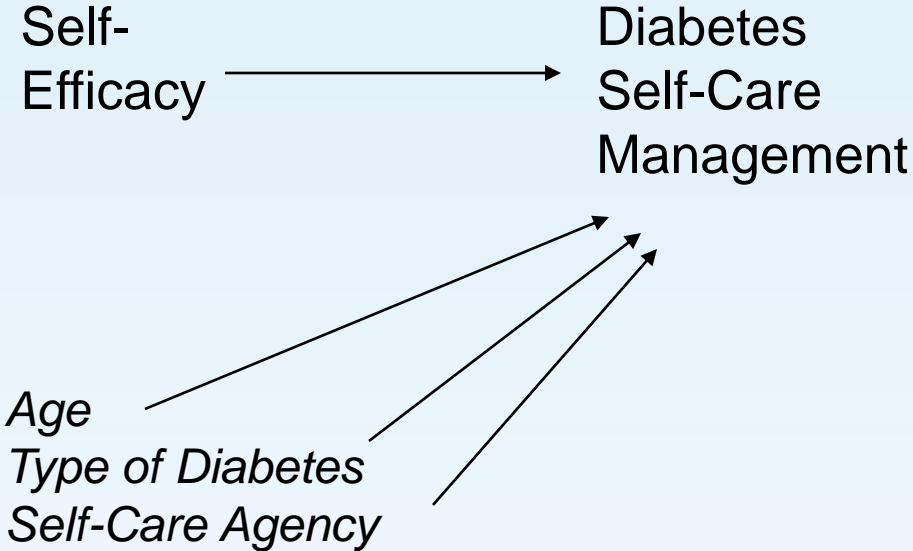
# Example of Empirical Adequacy: Quantitative Theory-Testing Study-- The Theory Before Testing



# Example of Empirical Adequacy: Quantitative Theory-Testing Study-- The Theory After Testing (Diabetes Self-Care Management)

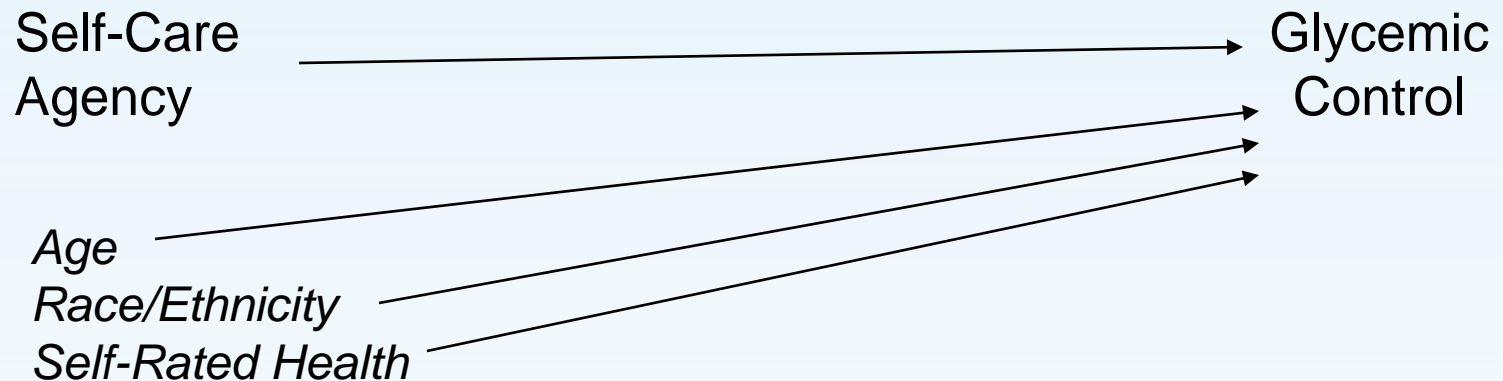
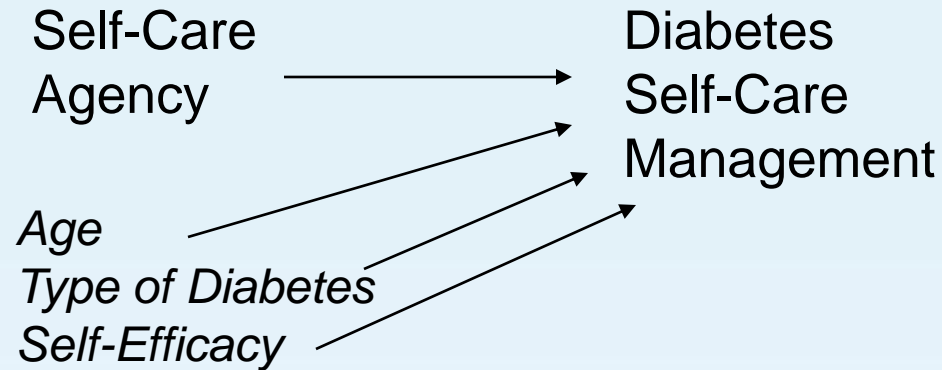


# Example of Empirical Adequacy: Quantitative Theory-Testing Study-- The Theory After Testing (Self-Efficacy)





# Example of Empirical Adequacy: Quantitative Theory-Testing Study-- The Theory After Testing (Self-Care Agency)



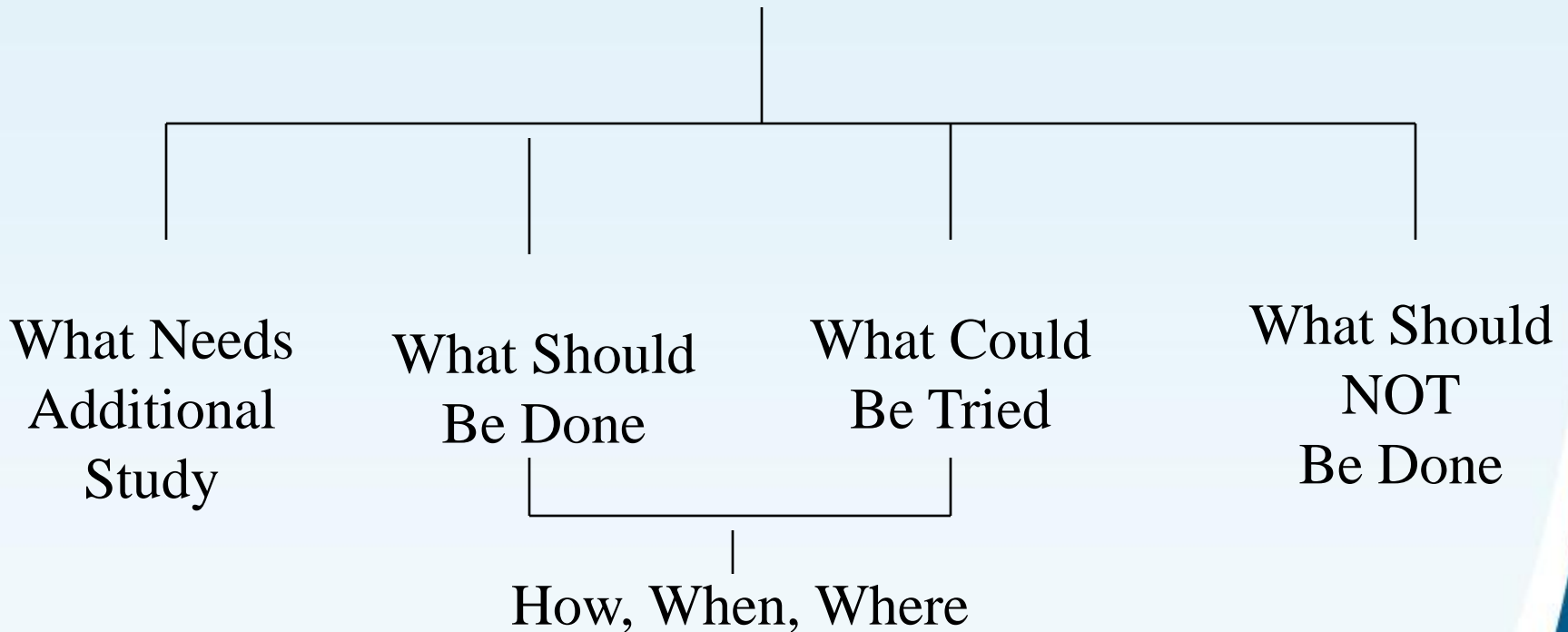
## Step Five: Evaluation of the Utility of the Theory for Practice

Information regarding the **pragmatic adequacy** of the theory is given

- Refers to the extent to which the theory should serve as a basis for practical activities
  - ✓ Use of the theory should be meaningful to society.
  - ✓ The theory should be appropriate for use in a specific practice situation
  - ✓ Use of the theory should be feasible in a particular practice setting
  - ✓ Use of the theory should be consistent with the public's expectations
  - ✓ Practitioners should have legal control of use of the theory in practice
- Look in the discussion section of the research report for the information

# Pragmatic Adequacy: The “Bottom Line” for Evidence-Based Practice

## Decision Tree for Using a Middle-Range Empirical Theory to Guide Practice



## Example of Pragmatic Adequacy: Qualitative Theory-Generating Study

“The Roy adaptation model (Roy & Andrews, 1999) directs nurses to assess behaviors in each mode of adaptation—physiological, self-concept, role function, and interdependence. The data from this study support the need for such a comprehensive assessment of each individual with MS. The data from this study also provide guidance for interventions that can enhance the quality of life for each person living with MS.”

## Example of Pragmatic Adequacy: Quantitative Theory-Testing Study

“In spite of its limitations, the findings from this study provide a better understanding of the relationships among self-efficacy, self-care agency, diabetes self-care management, and glycemic control. Knowing the factors that influence individuals’ performance of diabetes self-care management and glycemic control is fundamental for nursing research and nursing practice; potential effective interventions can be designed, tested in research, and then applied to nursing practice, which will then lead to the ultimate goal of diabetes care: better glycemic control level. Because diabetes requires continual monitoring and management, nurses need to implement interventions such as patient counseling, education, and self-care skills training to enhance patient self-efficacy, self-care agency, and diabetes self-care, and ultimately, help patients achieve desirable glycemic control.”

## Step Six: Evaluation of the Utility and Soundness of the Conceptual Model

Information regarding the **legitimacy** of the conceptual model is given

- Refers to the extent to which the research supports the usefulness and soundness of the conceptual model
- ✓ The conceptual model should be a useful guide for research
- ✓ The research design and findings should reveal that the content of the conceptual model is sound and believable
- Look in the discussion section of the research report for the information

## Example of Conceptual Model Legitimacy: Qualitative Theory-Generating Study

“Collectively, the five themes identified in the data clearly reflect Roy’s (1983) conceptualization of adaptation as ‘a process involving an holistic functioning of the person using his/her potential to affect health positively’ (p. 266).”

# Example of Conceptual Model Legitimacy: Quantitative Theory-Testing Study

The Enhance-Behavior-Performance Model was not mentioned in the discussion section.



## Example of Conceptual Model Legitimacy: Another Quantitative Theory-Testing Study

A longitudinal correlational study designed to test the Theory of Adaptation During Childbearing (see slide 10):

“The Roy Adaptation Model provided a useful structure for our review of the literature and led to the identification of the study variables...We tested the [legitimacy] of the Roy Adaptation Model by examining evidence for the proposition that the response modes are interrelated. ... Collectively, the findings of our study add to the accumulating evidence supporting the [legitimacy] of the Roy Adaptation Model. The magnitude of statistically significant correlations between variables representing the four response modes indicated that the modes are interrelated but also independent components of adaptation to environmental stimuli.”

## Reference: Framework for Evaluating Research for Evidence-Based Nursing Practice

Fawcett, J., & Garity, J. (2009). *Evaluating research for evidence-based nursing practice*. Philadelphia: F. A. Davis.

## References: Qualitative Theory-Generating Research

Gagliardi, B. A., Frederickson, K., & Shanley, D. A. (2002). Living with multiple sclerosis: A Roy adaptation model-based study. *Nursing Science Quarterly*, 15, 230-236.

Garity, J. (2006). Caring for a family member with Alzheimer's disease: Coping with caregiver burden post-nursing home placement. *Journal of Gerontological Nursing*, 32(6), 39-48.

## References: Quantitative Theory-Testing Research

Sousa, V. D., Zauszniewski, J. A., Musil, C. M., Lea, P. J. P., & Davis, S.A. (2005). Relationships among self-care agency, self-efficacy, self-care, and glycemic control. *Research and Theory for Nursing Practice*, 19, 217-230.

Tulman, L., & Fawcett, J. (2003). *Women's health during and after pregnancy: A theory-based study of adaptation to change*. New York: Springer.