

# Avoidant Coping Moderates the Association between Anxiety and Physical Functioning in Patients with Chronic Heart Failure

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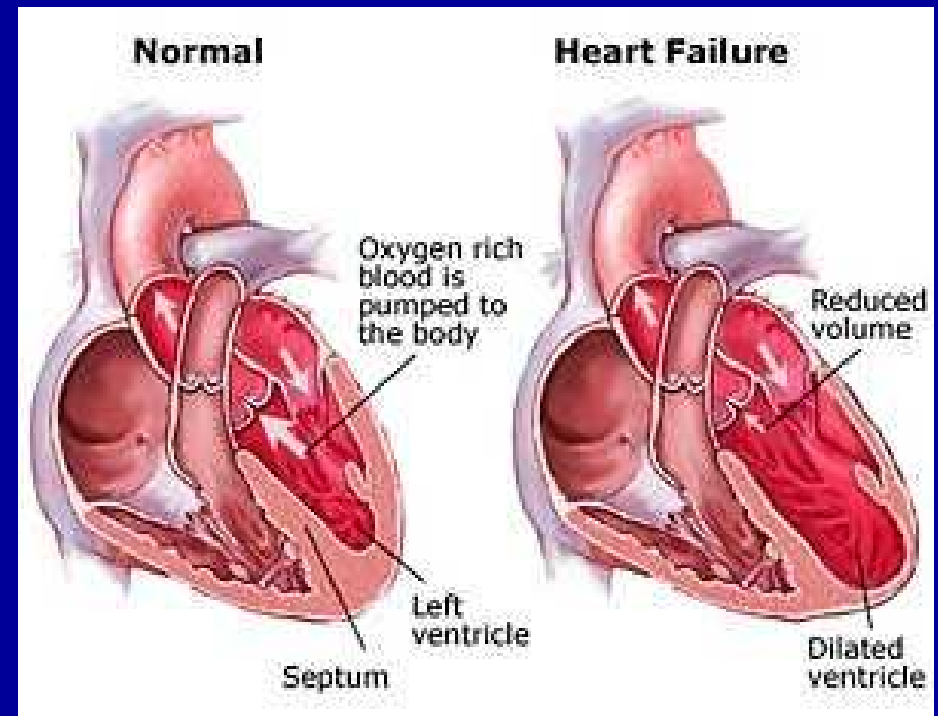
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# Heart Failure

- Most costly cardiovascular disease in the US
- Leading cause for hospitalization in older adults
- Hospitalizations due to heart failure have risen by approximately 30% over the past decade



(Sullivan et al., 2002; Thomas et al., 2003; American Heart Association, 2005)

# Anxiety and Heart Failure

- Negative mood state characterized by symptoms such as worry, tension, feeling frightened and restlessness
- Prevalence rates range from 20-45%
- In heart failure patients, anxiety is associated with:
  - Severe limitation in activities of daily living at one year follow-up
  - Mortality at two year follow-up



(American Psychiatric Association, 1994; Haworth et al., 2005; Friedmann, et al., 2006; De Jong et al., 2004; Riedinger, 2002; De Jong, 2004; Clarke et al., 2000; Friedmann et al., 2006)

# Coping Strategies

- Methods individuals utilize in their efforts to manage stressors

## Approach Coping

- Approaching source of stress
- Linked to improved quality of life

## Avoidant Coping

- Avoiding source of stress
- Linked to poorer clinical outcomes and mortality

# Coping Strategies

- Mediator
  - Coping strategies partially account for the association between anxiety and physical functioning
- Moderator
  - Coping influences the strength of the association between anxiety and physical functioning

# Study Objectives

- Examine the association between anxiety and physical functioning in patients with chronic heart failure
- Understand how the relationship between anxiety and physical functioning is influenced by patients' coping strategies
  - Mediator
  - Moderator

# Participants (N = 273)

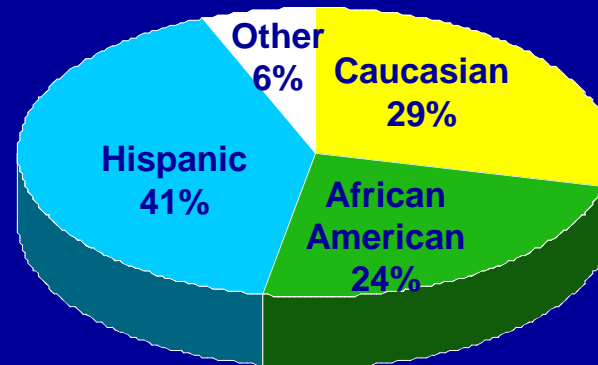
- **Age:**

$M = 53.63$ ,  
 $SD = 11.18$

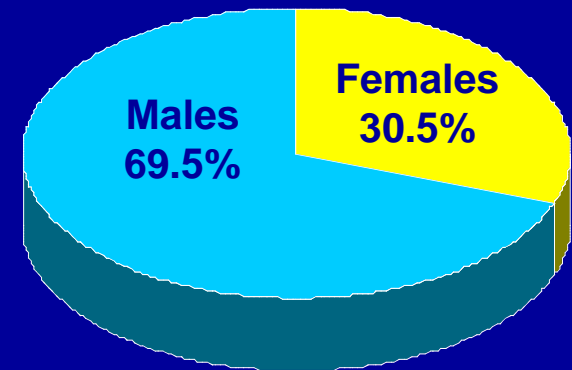
- **Months Since Diagnosis:**

$M = 63.69$ ,  
 $SD = 66$

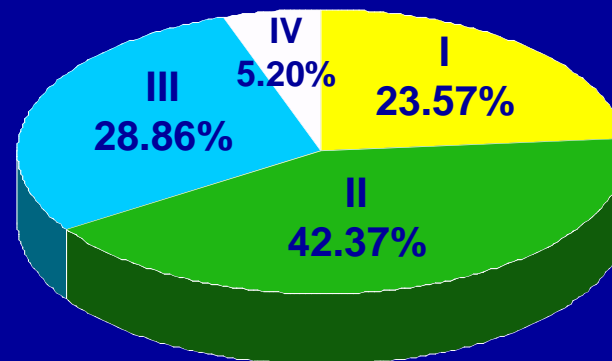
**Ethnicity**



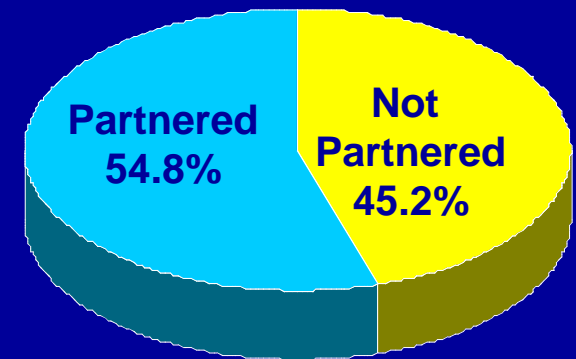
**Gender**



**NYHA Class**



**Marital Status**



# Design & Measures

- Cross-sectional, correlational design
- Structured Medical Interview
  - NYHA class and history of mental health treatment
- Medical Chart Review
  - Medical history, comorbidities and medications
  - Demographic Questionnaire
    - Age, gender, marital status, education level and ethnicity

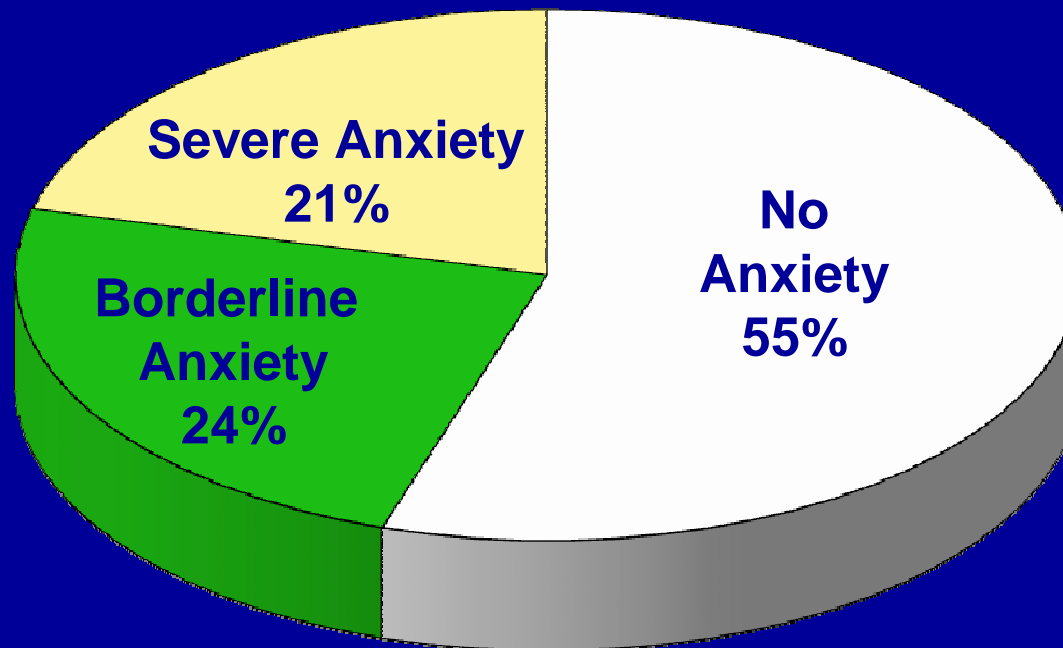


# Psychosocial Questionnaires

- Hospital Anxiety and Depression Scale-Anxiety Subscale
- Modified Brief COPE
  - Approach Coping
    - Active coping, positive reframing, planning, acceptance, seeking emotional support, and seeking informational support
  - Avoidant Coping
    - Denial, substance use, venting, behavioral disengagement, self-distraction, and self-blame
- Minnesota Living with Heart Failure Questionnaire
  - Physical Functioning Subscale

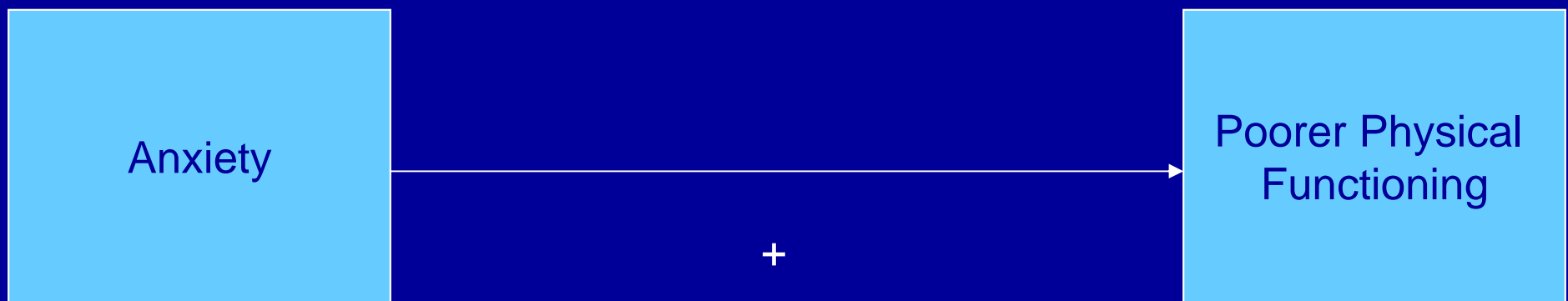
# Results

## Prevalence of Anxiety



# Hypothesis 1

- Anxiety will be significantly associated with poorer physical functioning in patients with chronic heart failure

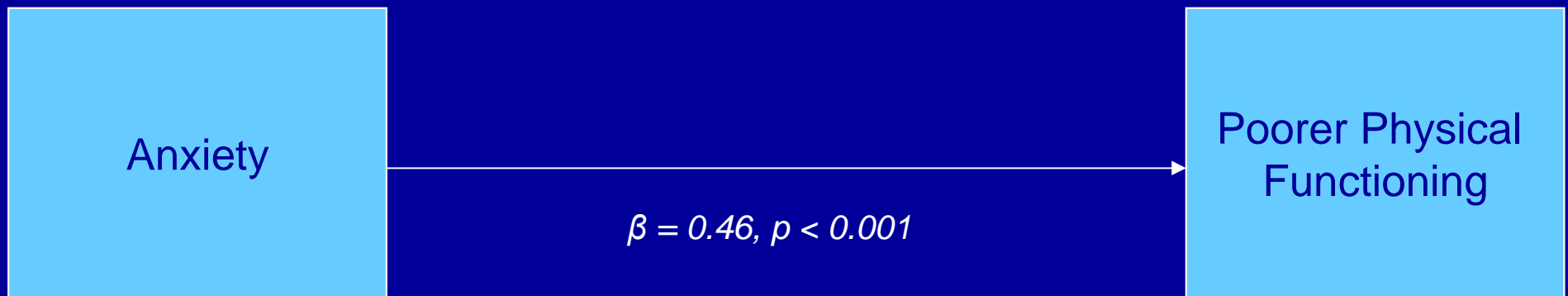


## *Covariates*

*Age, gender, marital status, education level, ethnicity, NYHA class, history of mental health treatment*

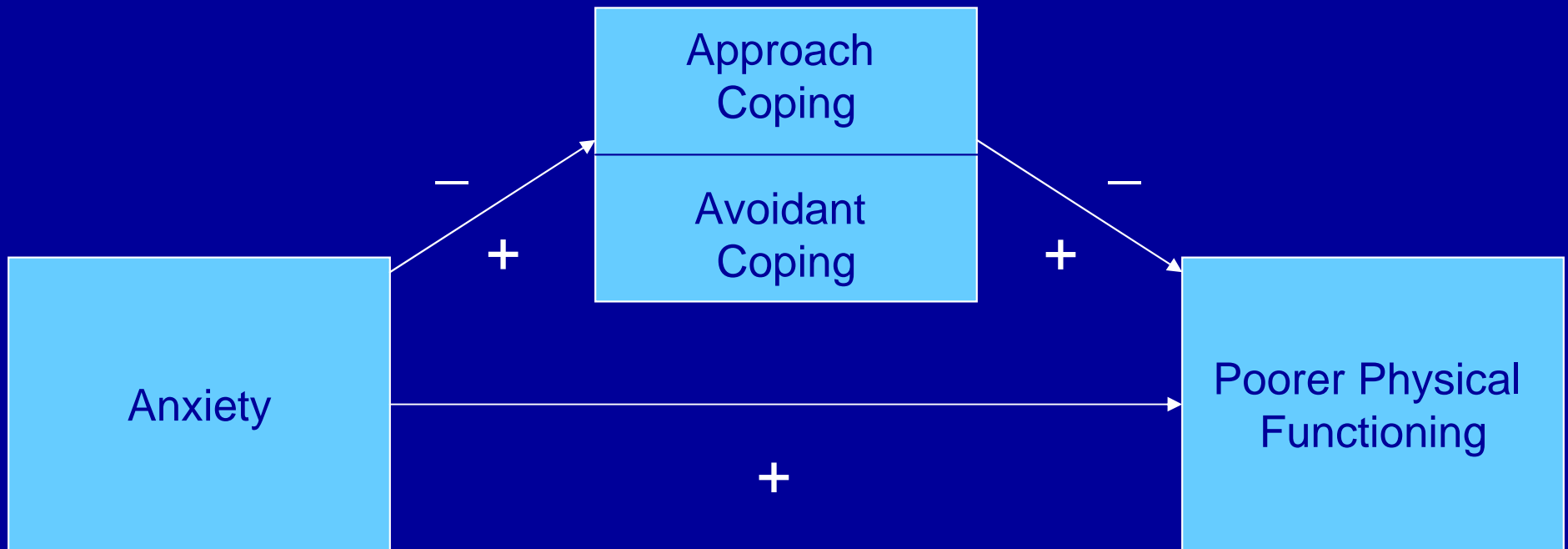
# Results: Hypothesis 1

- Significant association between anxiety and poorer physical functioning

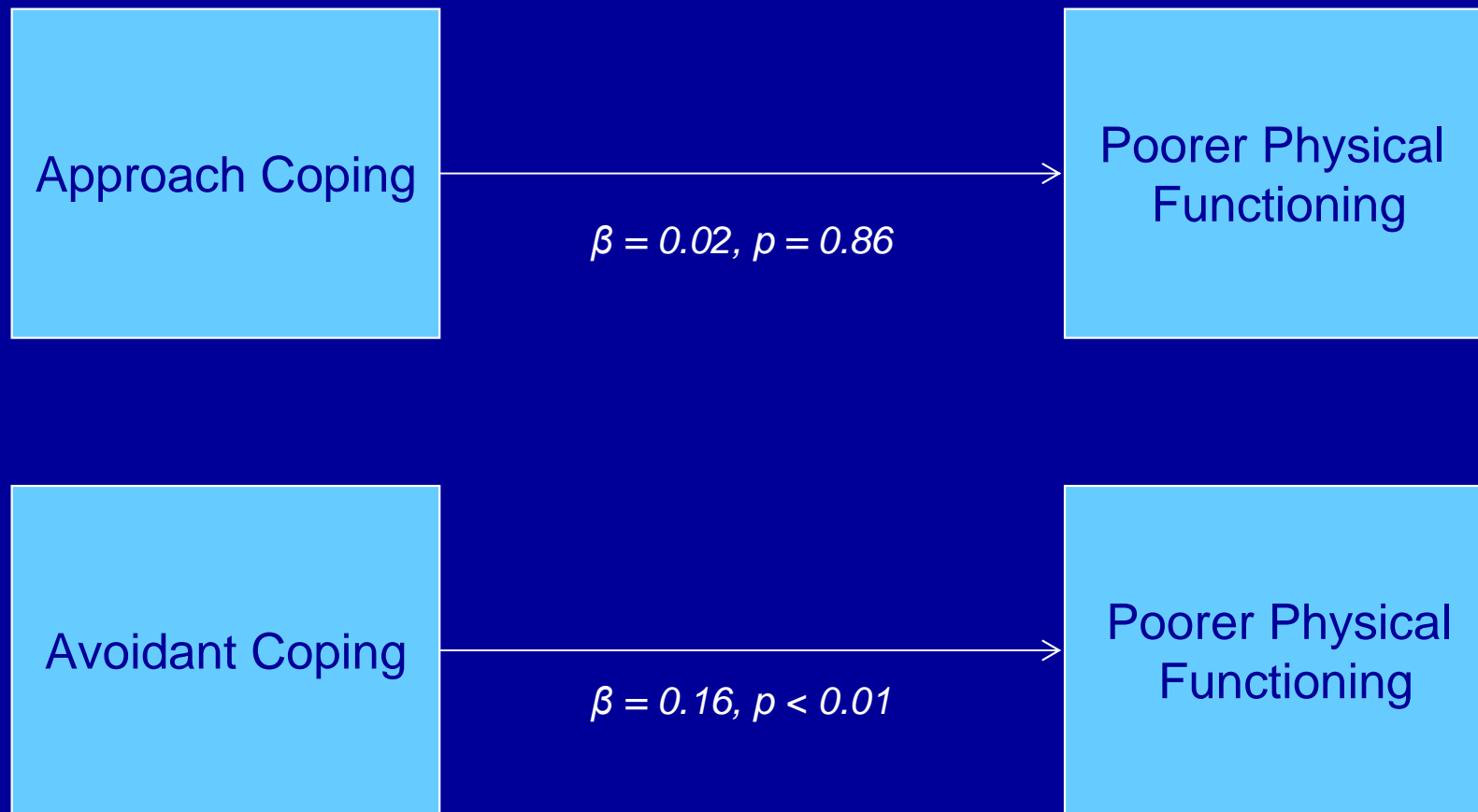


# Hypothesis 2

- Approach and avoidant coping will mediate the association between anxiety and physical functioning

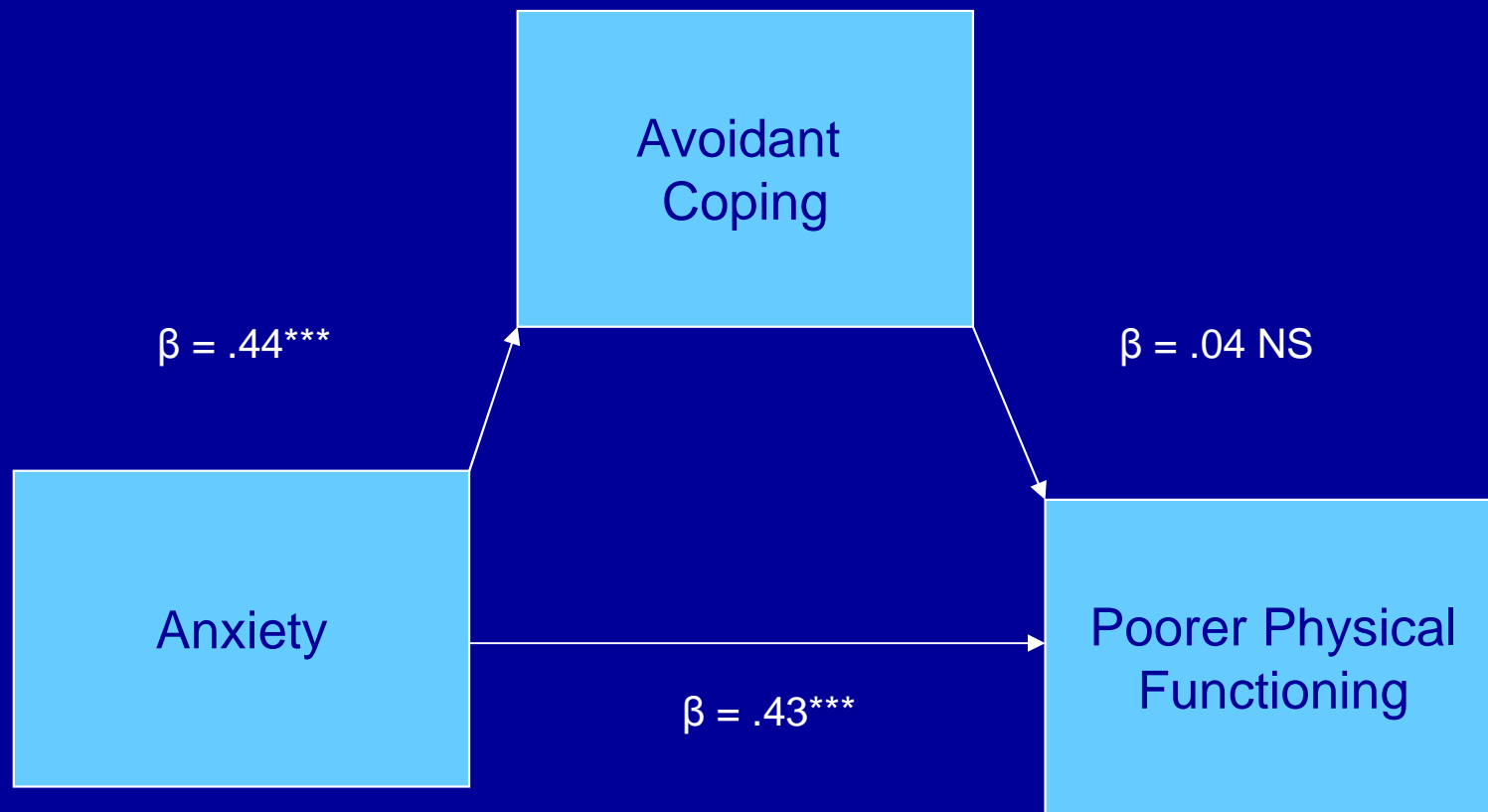


# Approach and Avoidant Coping



# Results: Hypothesis 2

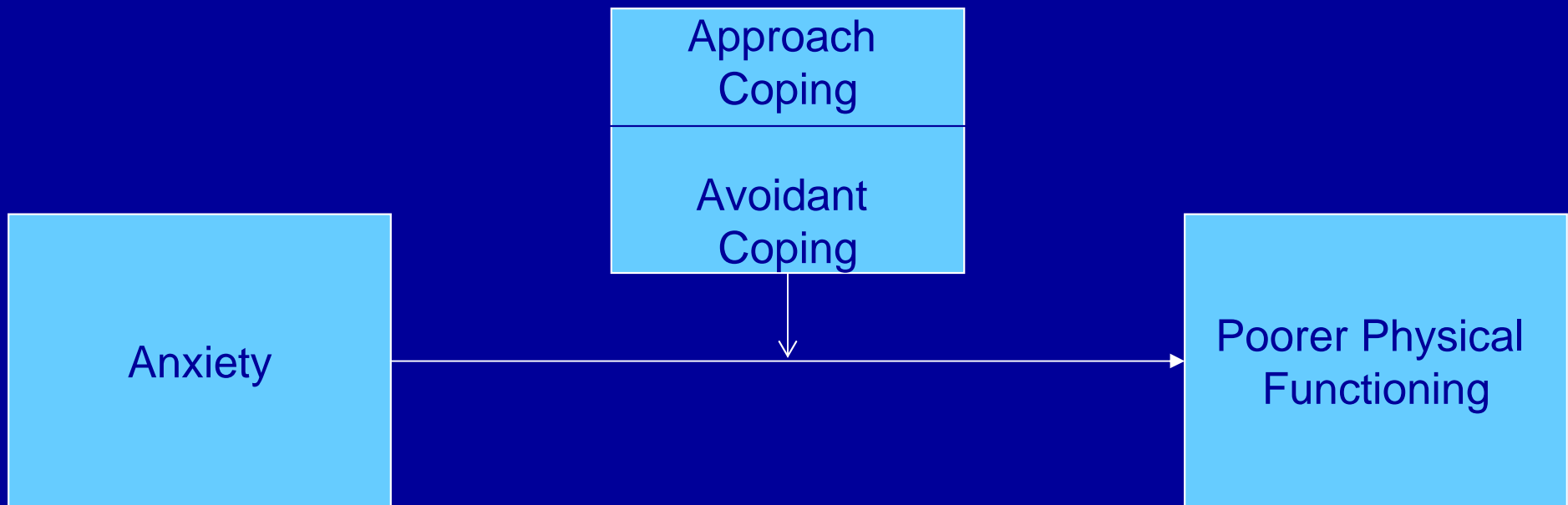
- Mediation Analyses



\*\*\* Significant at  $p < 0.001$  level

# Hypothesis 3

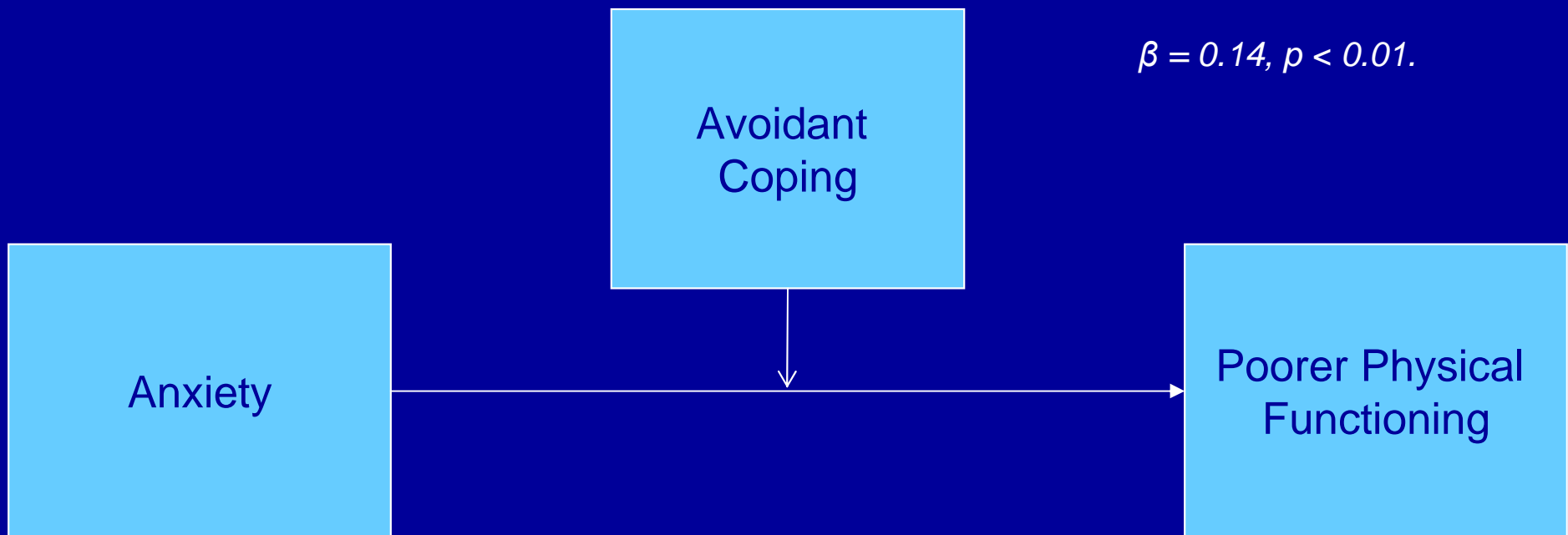
- Approach and avoidant coping will moderate the association between anxiety and physical functioning





# Results: Hypothesis 3a

- Significant interaction between anxiety and avoidant coping



# Post-Hoc Analyses

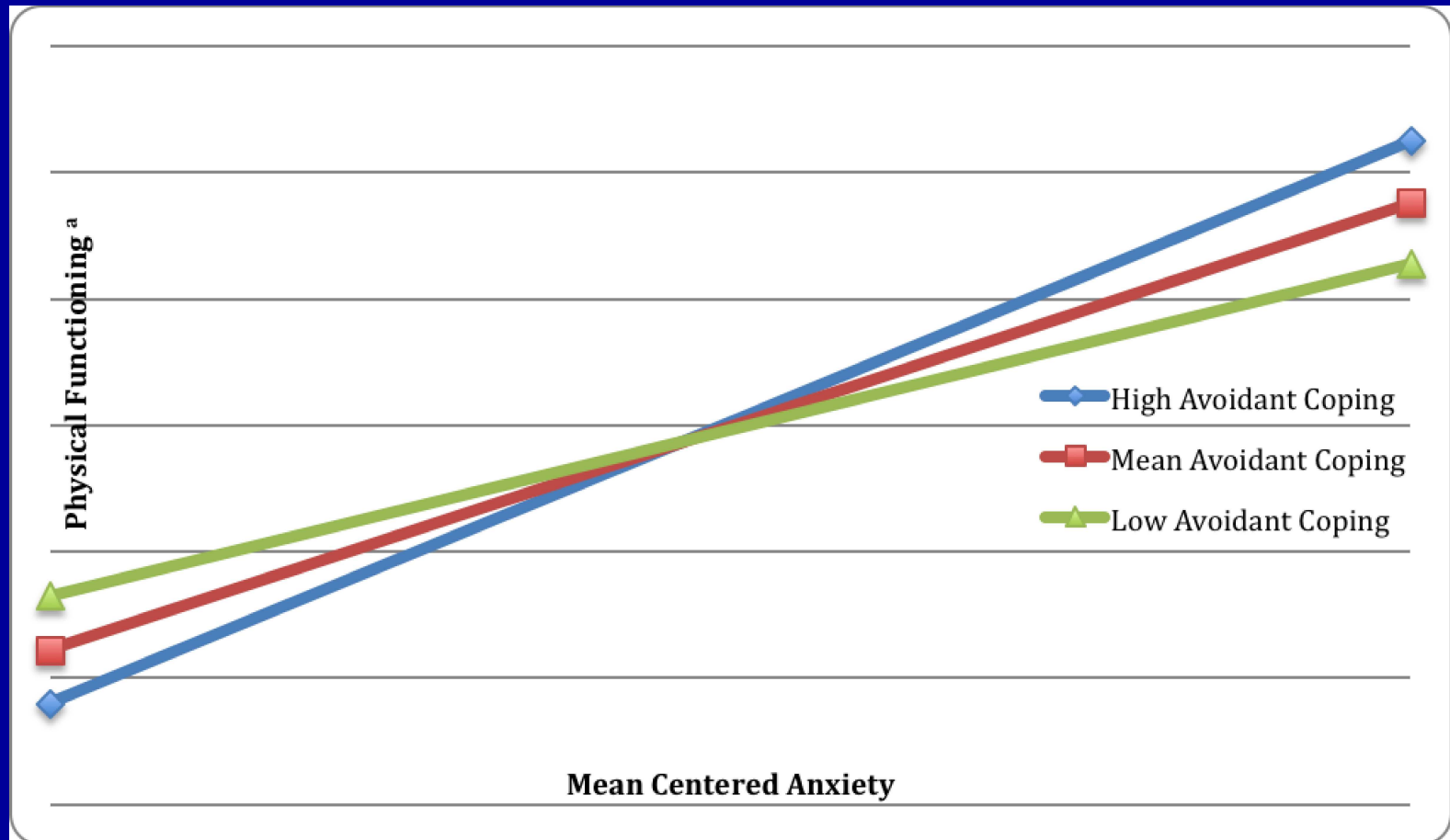
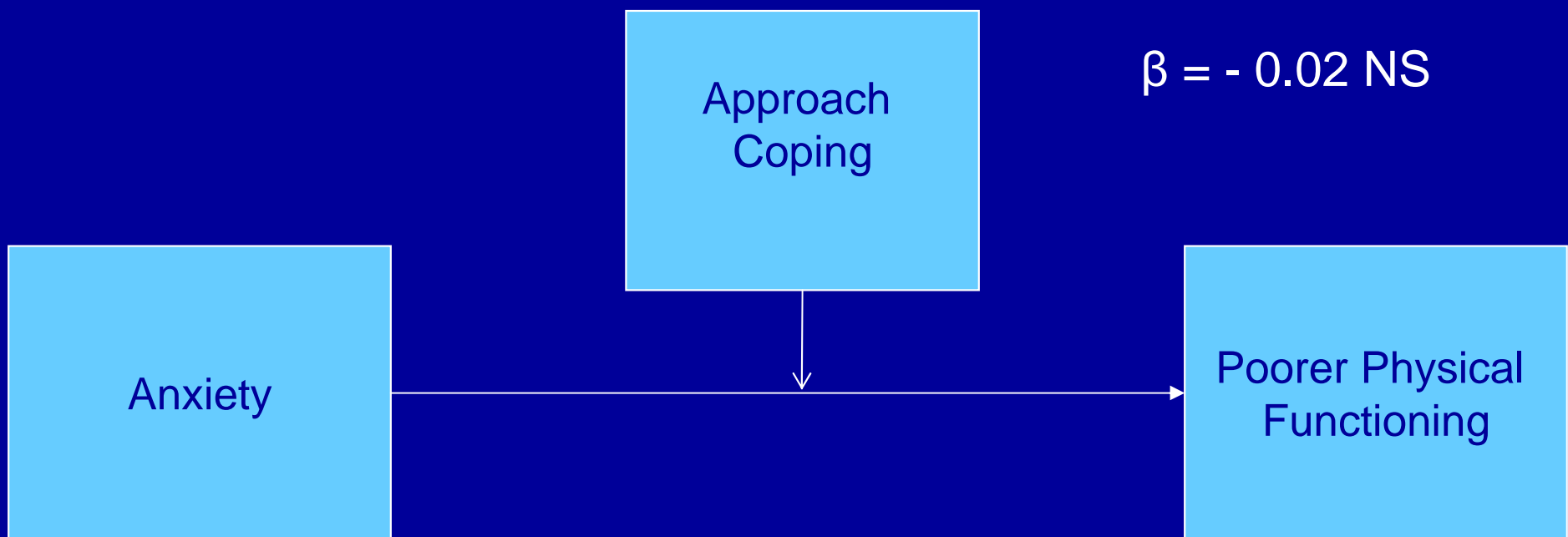


Figure 1. Simple slopes of association between anxiety and physical functioning at high, mean and low levels of avoidant coping.

<sup>a</sup> Higher physical functioning scores indicate poorer functioning.

# Results: Hypothesis 3b

- Approach coping did NOT moderate association between anxiety on physical functioning



# Summary

- Almost half of the patients experienced moderate to severe anxiety symptoms
- Anxiety was associated with poorer physical functioning
- Association between anxiety and poorer physical functioning was more pronounced in those patients who frequently employed avoidant coping strategies
- Approach coping neither mediated nor moderated the association between anxiety and poorer physical functioning

# Possible Mechanisms

- Physiological
  - Sympathetic hyper-arousal
  - Reduced heart rate variability
  - Elevated inflammation
- Behavioral
  - Lack of self-care or unhealthy lifestyle
  - Adherence
    - Diet
    - Medication

# Limitations & Strengths

- Limitations
  - Cross-sectional, correlational design
  - Self report measures
- Strengths
  - Fairly large sample size
  - Anxiety measure not confounded with heart failure symptoms

# Clinical Implications

- Both anxiety and coping strategies warrant assessment in patients with chronic heart failure
- Patients who demonstrate both high anxiety and a tendency to employ avoidant coping strategies may benefit from more careful monitoring for physical impairments
- Interventions designed to reduce anxiety may be helpful

# Future Directions

- Longitudinal design
- Diagnostic interview
- Intervention studies



# Acknowledgments

- This research was supported by a grant from the American Heart Association
- Uta Maeda
- Tiffany Ju
- Kristen Farrell



# Statistical Analyses

- Hierarchical multiple regression
  - Mediation
    - Baron and Kenny (1986) approach
  - Moderation
    - Significant regression coefficient for interaction term
    - Examine simple slopes for significant interactions
- Covariates
  - Age, gender, marital status, education level, ethnicity
  - NYHA class, history of mental health treatment (psychotherapy, antidepressant use, or benzodiazepine use)

# Possible Mechanisms

- Physiological
  - Sympathetic hyper-arousal
  - Reduced heart rate variability
  - Elevated inflammation
  - Hypercortisolemia
- Behavioral
  - Lack of self-care or unhealthy lifestyle
  - Adherence
    - Diet
    - Medical

# Anxiety without #s 4 and 6

- Anxiety --> physical functioning
  - Beta=.383,  $p < .001$
- Anxiety x avoidant coping interaction
  - Beta=.193,  $p < .05$



# Main effect of anxiety

<b>Block 1</b>	<b>β Model 1</b>	<b>β Model 2</b>
BMI	1.68**	.10*
Age	-0.01	.07
Gender	0.003	.02
Marital Status	0.07	.08
Education	-0.05	-.02
Current Smoking	-0.15**	-.08
History of MI	1.66**	.11*
Mental Health Treatment	-0.05	-.07
NYHA class	0.46***	.40***
African American Ethnicity	0.02	.05
Hispanic Ethnicity	-0.11	-.08
Other Ethnicity	0.11	.07
<b>Block 2</b>		
Anxiety		.42***
<b>Δ R<sup>2</sup></b>	0.35	0.15
<b>F Change</b>	10.90***	69.70***
<b>Final R<sup>2</sup></b>	0.35	0.49

# Descriptive Statistics for Psychological Variables

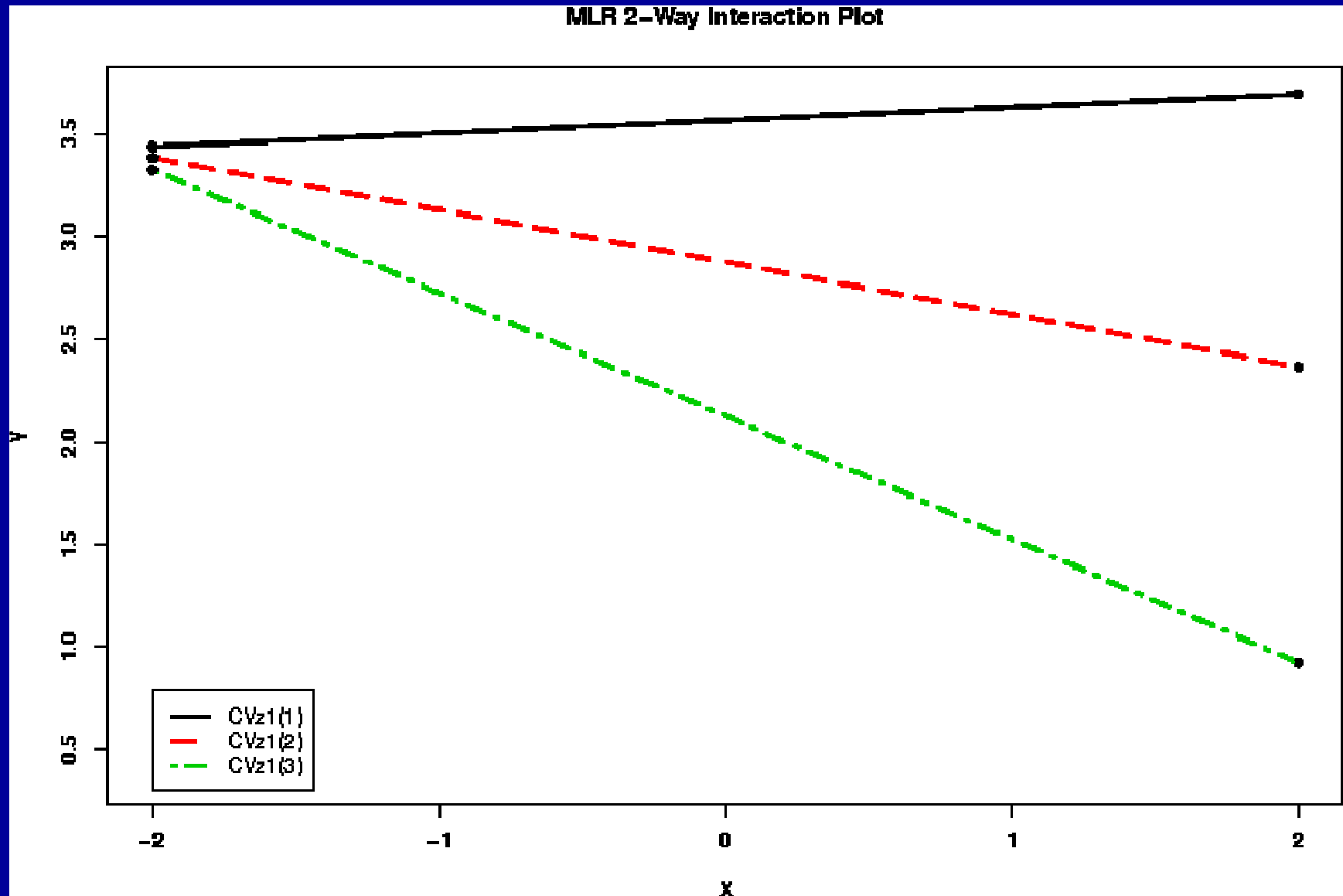
<u>Physical Health Functioning and Psychological Measures</u>	
Physical functioning (MLHFQ)	2.52 (1.57)
Anxiety (HADS-A)	6.86 (4.48)
Approach coping (Brief COPE)	3.05 (0.76)
Avoidant coping (Brief COPE)	1.54 (0.55)
Social support (MOS-Social Support Scale)	3.99 (1.02)



# Interaction between anxiety and avoidant coping in their effect on physical functioning

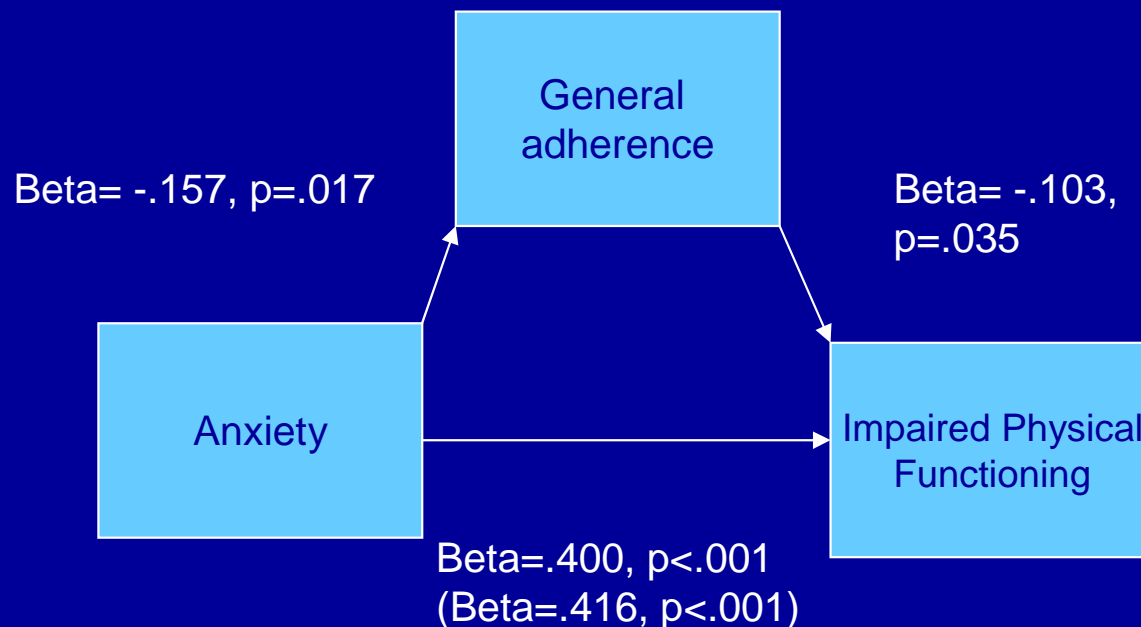
Block 1	$\beta$ Model 1	$\beta$ Model 2	$\beta$ Model 3
BMI	1.68**	.10*	.09
Age	-0.09	.02	.02
Gender	0.01	.02	.01
Marital Status	0.07	.08	.08
Education	-0.05	-.02	-.03
Current Smoking	-0.15**	-.08	-.08
History of MI	1.66**	.11*	.10*
Mental Health Treatment	-0.05	-.07	-.06
NYHA class	0.46***	.40***	.42***
African American Ethnicity	0.02	.05	.04
Hispanic Ethnicity	-0.11	-.08	-.08
Other Ethnicity	0.12	.07	.09
Block 2			
Anxiety		.43***	.44***
Avoidant Coping		-.03	-.09
Block 3			
Anxiety*Avoidant Coping			.12*
$\Delta R^2$	0.35	0.15	0.01
F change	10.90***	35.03***	5.91*
Final R <sup>2</sup>	0.35	0.49	0.51

# Effect of avoidant coping on physical functioning at 3 levels of anxiety



# General Adherence

- General adherence  $\rightarrow$  physical functioning  $\beta = -.161, p=.003$
- Test for mediation



# Specific Adherence

- Specific Adherence → physical functioning  $\beta = -.043$ ,  $p=.420$
- Also not sig. associated with anxiety

# Controlling for depression

- Direct effects
  - Anxiety → Physical functioning  $\beta=.321, p<.001$
  - Depression → physical functioning  $\beta=.131, p=.07$
- Moderation
  - Anxiety x avoidant coping interaction (controlling for depression)  $\beta=.119, p=.02$
  - Depression x avoidant coping interaction  $\beta=.093, p=.087$

# Hospital Anxiety Depression Scale-Anxiety Subscale (Zigmond and Snaith, 1983)

- Anxiety symptomatology, not specific clinical anxiety disorders
- Medically ill patients
  - Excludes symptoms related to physical disorders such as dizziness, heart palpitations, and sweating
- Internal consistency: Chronbach's alpha: .76-.93
- Concurrent validity with established measures of state and trait anxiety: Spielberger State-Trait Anxiety Inventory ( $r=.64-.81$ ), Clinical Anxiety Scale ( $r = .69-.75$ )
- Discriminant validity with depression

# HADS-A discriminant validity with depression and physical functioning

- Depression

Table 2

Correlations between interview ratings and patient ratings of subsample

Patient ratings	Interview ratings	
	Anxiety	Depression
Anxiety	+ 0.54*	+ 0.19
Depression	+ 0.08	+ 0.79**

\*  $P < 0.05$

\*\*  $P < 0.01$

- Physical Functioning

- physically ill patients, who were not assessed as having mood disorder, had similar scores to the normal sample and that scale scores were therefore not affected by physical illness.

# Brief COPE (modified)

## Carver, 1997

- Designed to assess how participants cope with a certain stressor (physical health problems).
- Modified, 14-item version
  - one item from each of the 14 subscales
- Subscales: active coping, planning, positive reframing, acceptance, using emotional support, using instrumental support, self-distraction, denial, substance use, behavioral disengagement, self-blame, humor, religion



# Alternative Conceptualizations of Coping

- Problem-Focused vs. Emotion-Focused
  - “Coping that is aimed at managing or altering the problem causing the distress” vs.
  - “Coping that is directed at regulating emotional responses to the problem” (Lazarus & Folkman, 1984, p. 150).
    - Not clear distinction
      - Focusing on your emotions might solve the problem
- Individual subscales
- Higher order goals
  - Regaining control
  - Regaining relationships
  - Maintaining homeostasis

# Minnesota Living with Heart Failure (Rector et al., 1987)

- Designed to assess patient's perception of effect of heart failure/treatment on life
  - Indicate the degree to which each heart failure related problem prevented them from living as they wanted during the last two weeks
  - 21 items: heart failure related physical, psychological, and social impairments
- Meta-analysis: Chronbach's alpha = .94 and test-retest reliability of .84
- Concurrent validity with other measures of quality of life including the SF-36 physical functioning ( $r=.74$ ), SF-36 Social Functioning ( $r=.70$ ), and the NYHA class ( $r=.60$ )