

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

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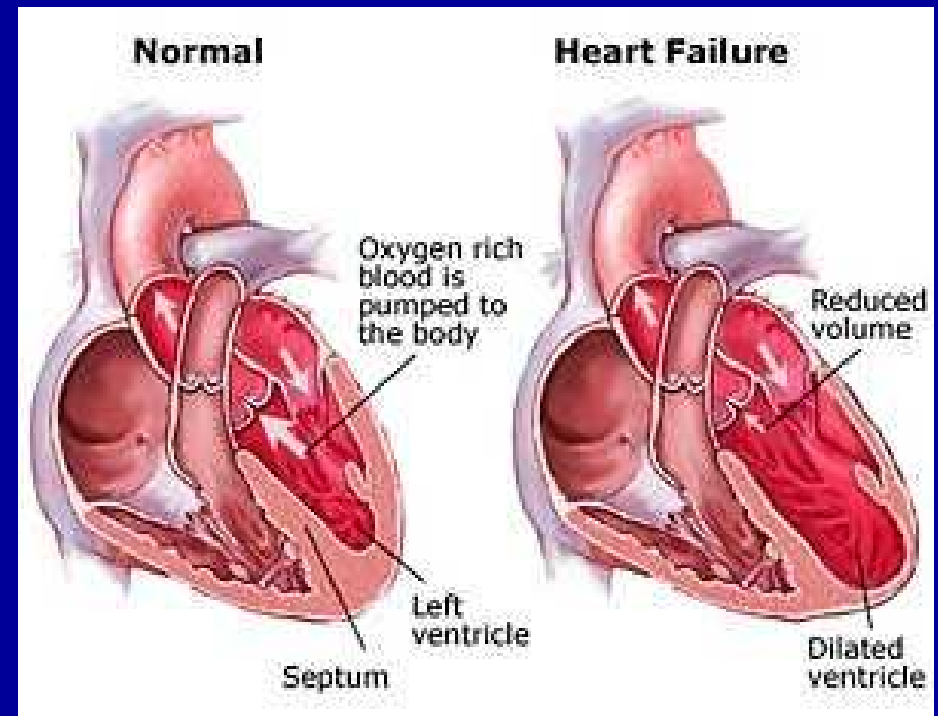
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Heart Failure

- 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)

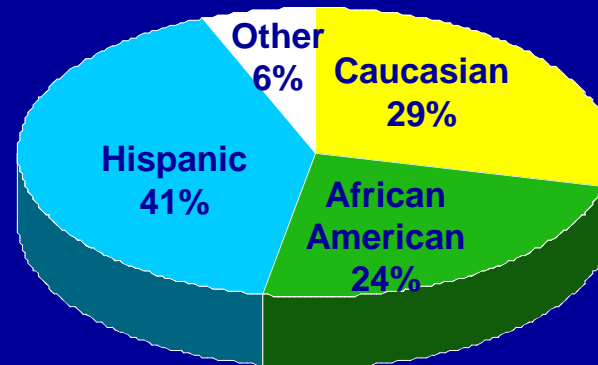
- **Age:**

$M = 53.63$,
 $SD = 11.18$

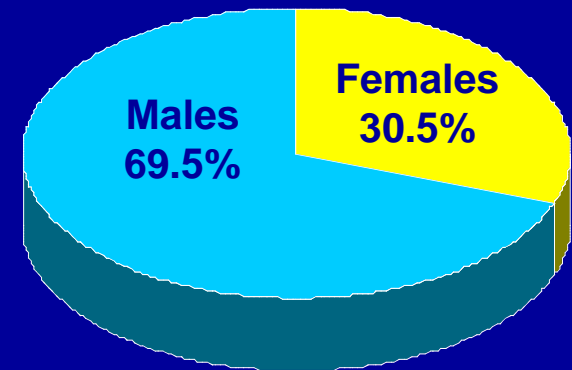
- **Months Since Diagnosis:**

$M = 63.69$,
 $SD = 66$

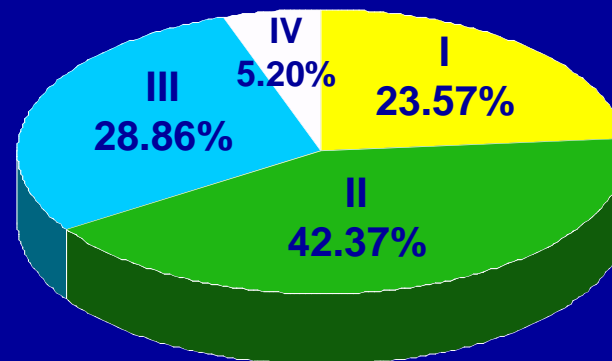
Ethnicity



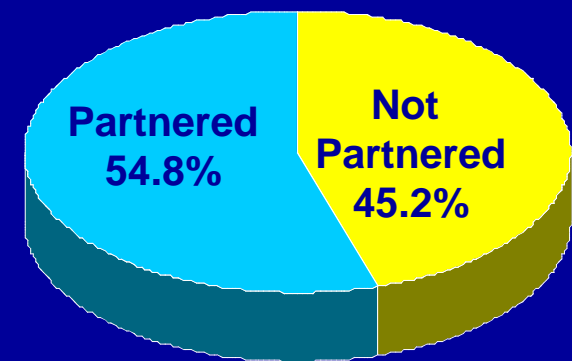
Gender



NYHA Class



Marital Status



Design & Measures

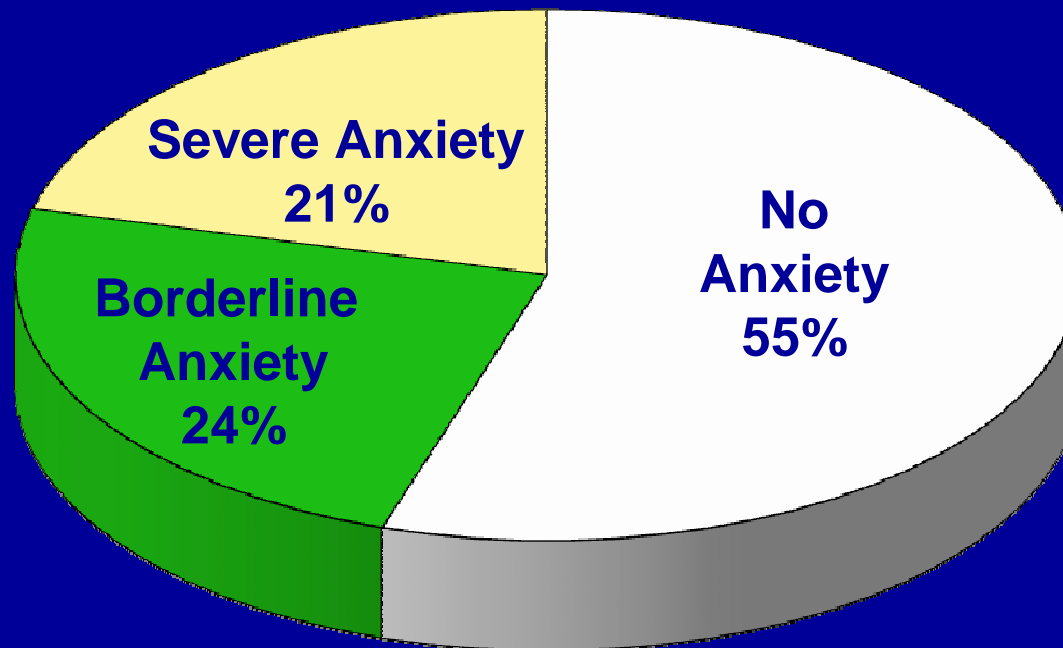
- Cross-sectional, correlational design
- Structured Medical Interview
 - NYHA class and history of mental health treatment
- Medical Chart Review
 - Medical history, comorbidities and medications
 - Demographic Questionnaire
 - Age, gender, marital status, education level and ethnicity

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

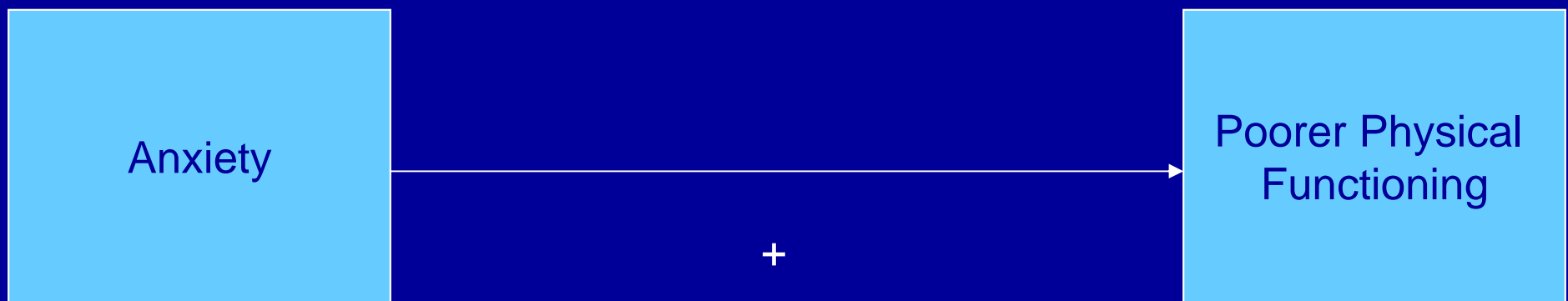
Results

Prevalence of Anxiety



Hypothesis 1

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

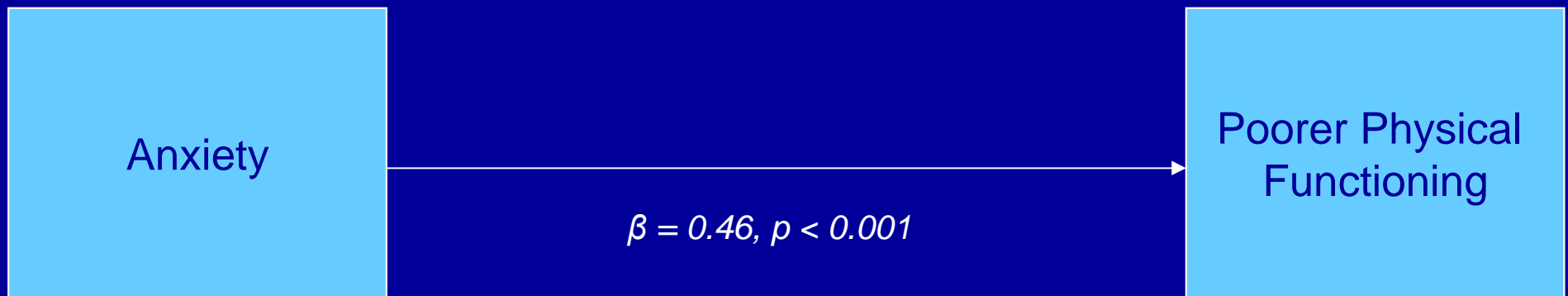


Covariates

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

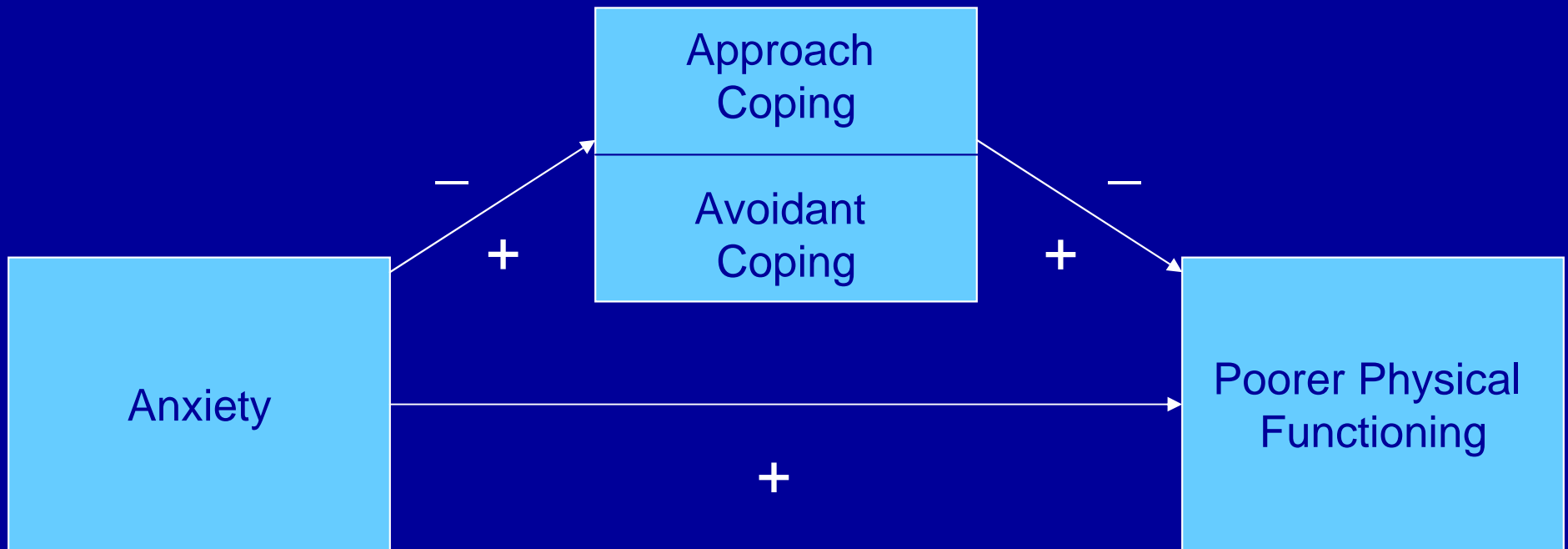
Results: Hypothesis 1

- Significant association between anxiety and poorer physical functioning

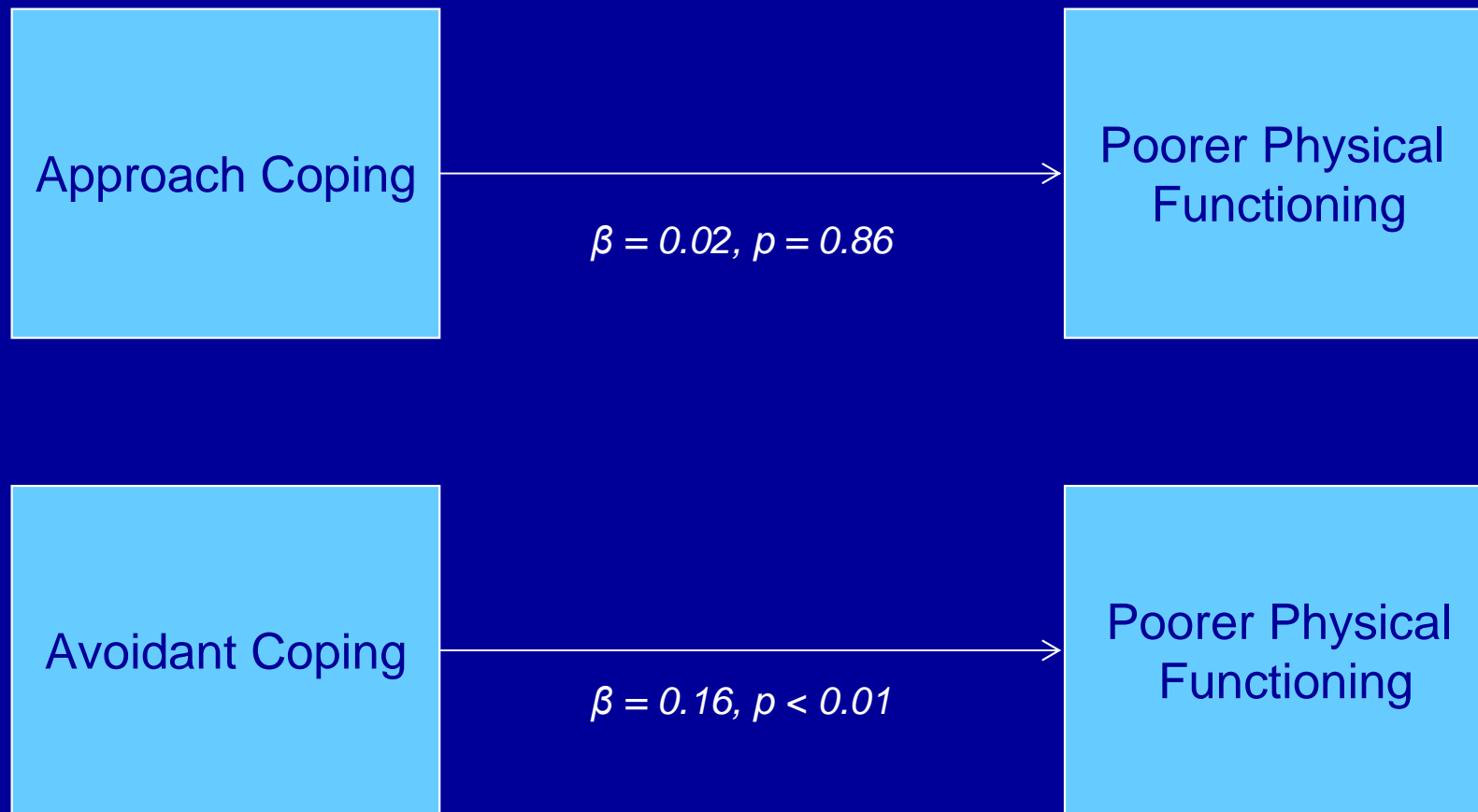


Hypothesis 2

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

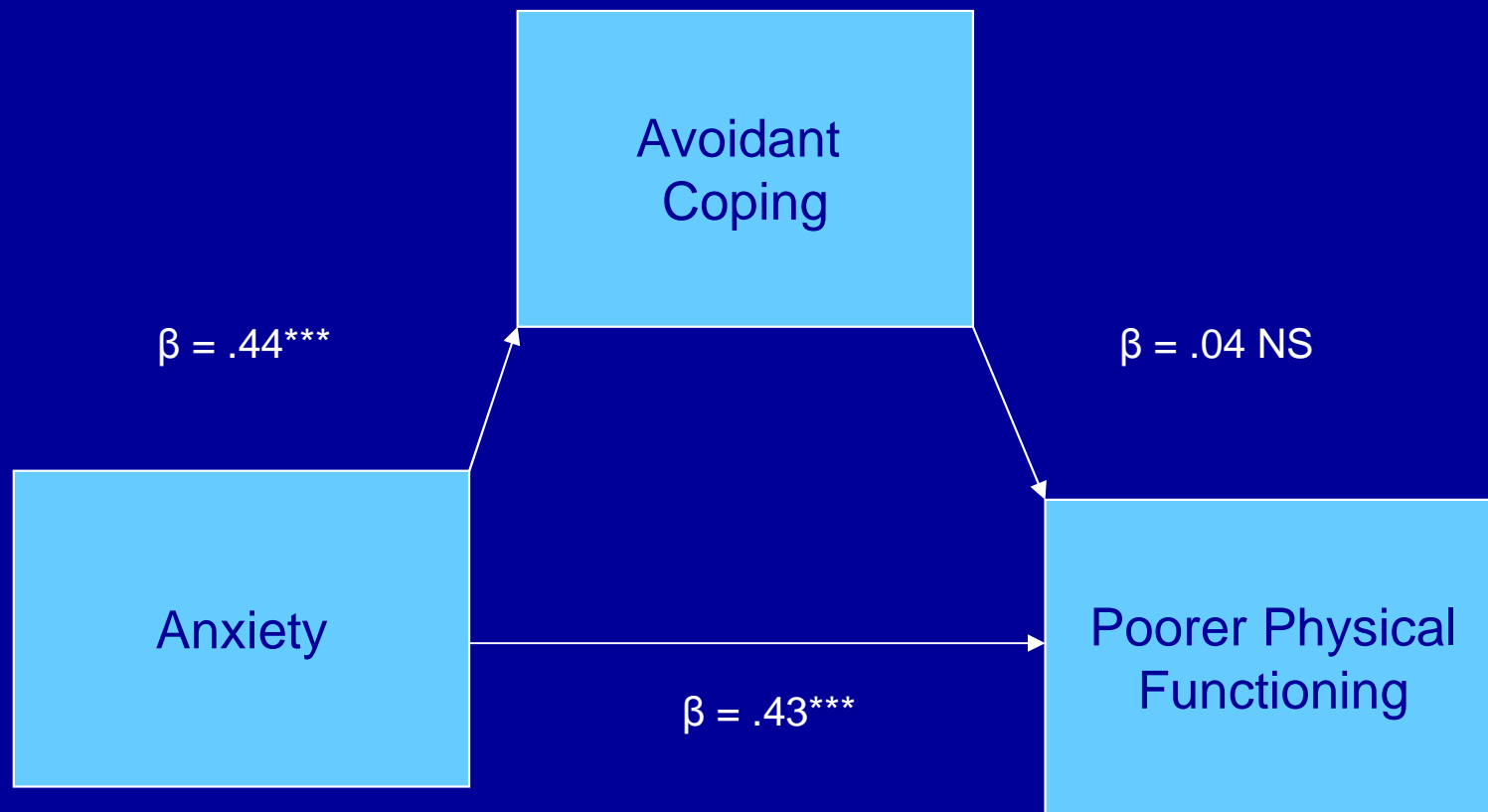


Approach and Avoidant Coping



Results: Hypothesis 2

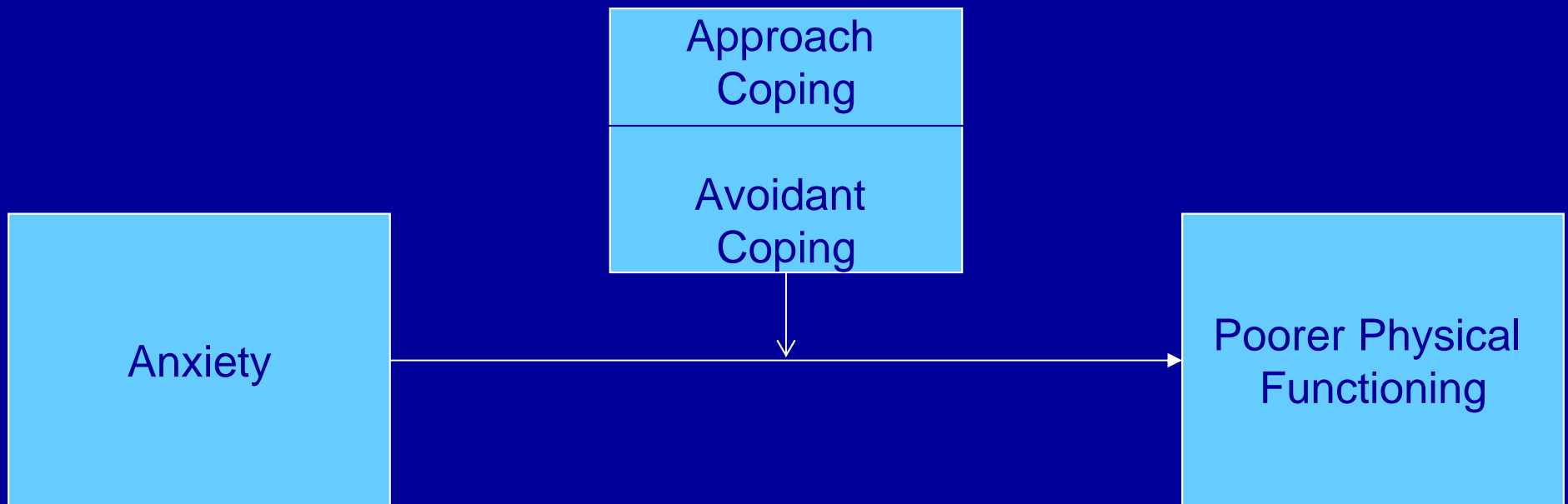
- Mediation Analyses



*** Significant at $p < 0.001$ level

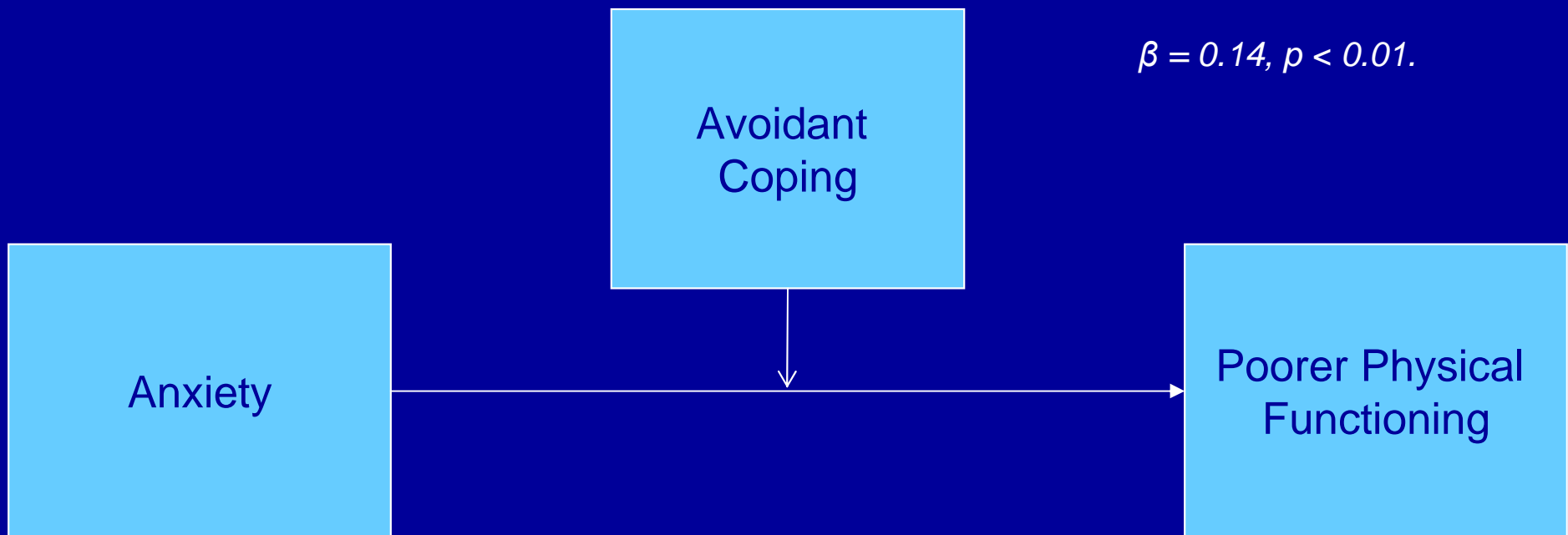
Hypothesis 3

- 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

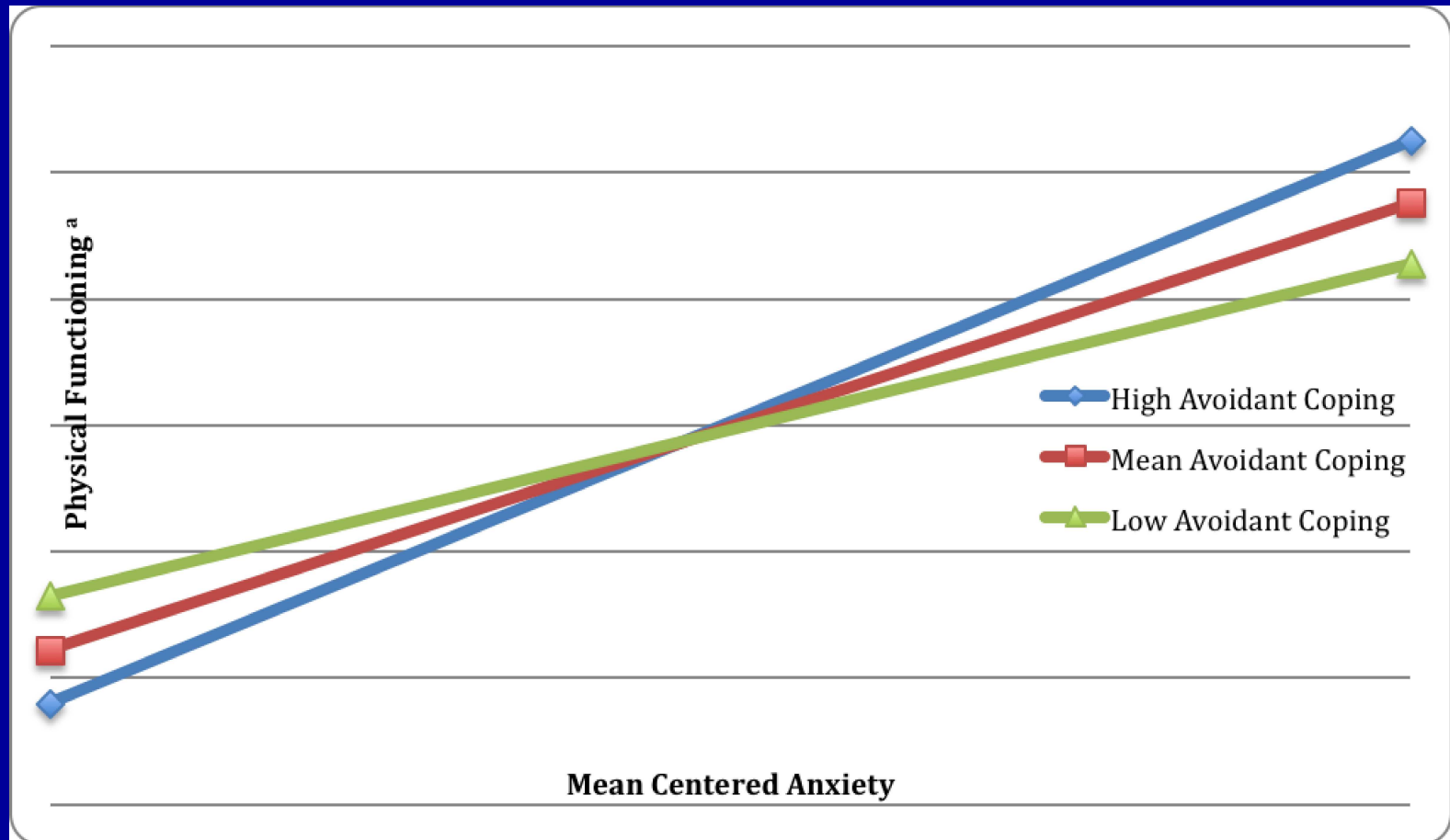
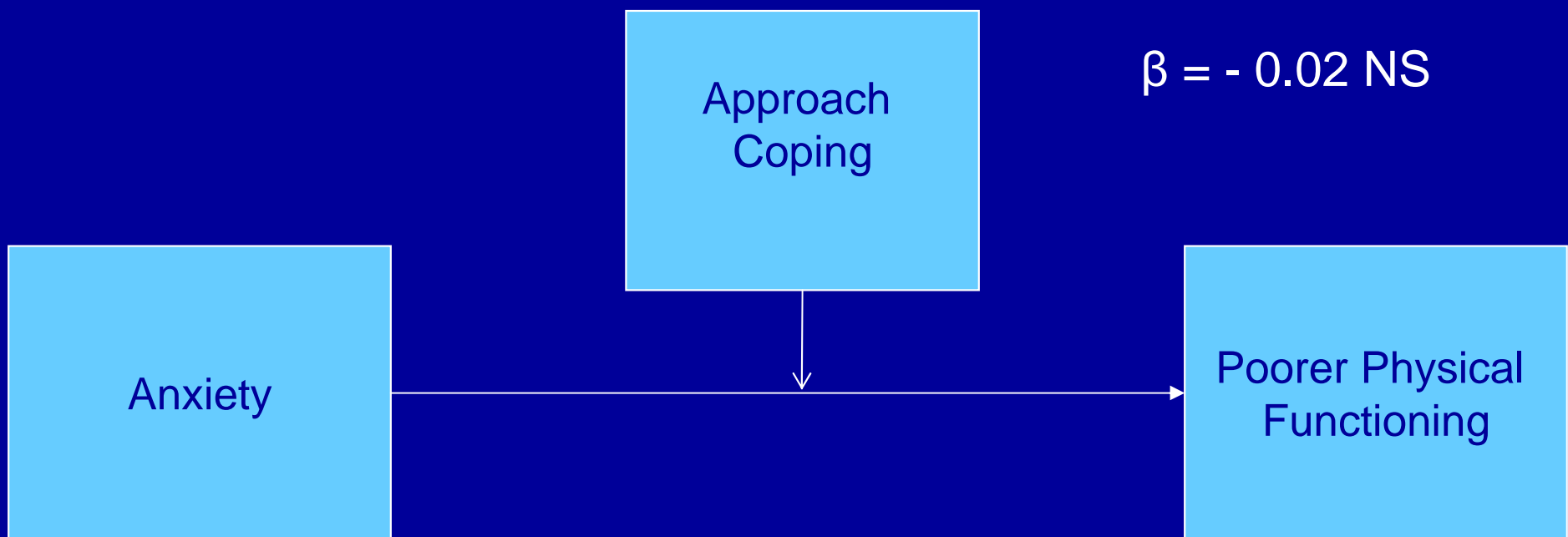


Figure 1. Simple slopes of association between anxiety and physical functioning at high, mean and low levels of avoidant coping.

^a 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

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- 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

Block 1	β Model 1	β Model 2
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
Block 2		
Anxiety		.42***
Δ R²	0.35	0.15
F Change	10.90***	69.70***
Final R²	0.35	0.49

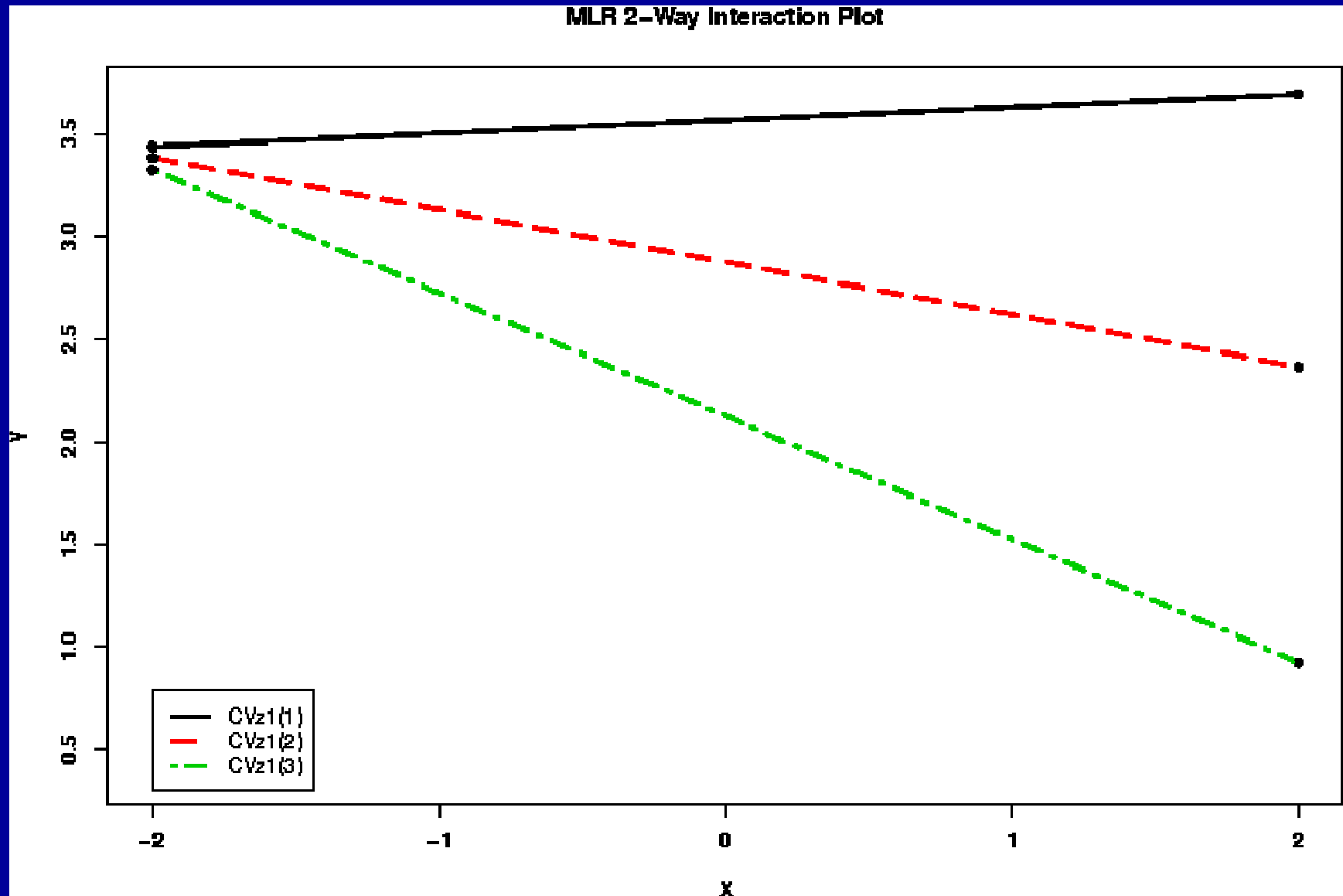
Descriptive Statistics for Psychological Variables

<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

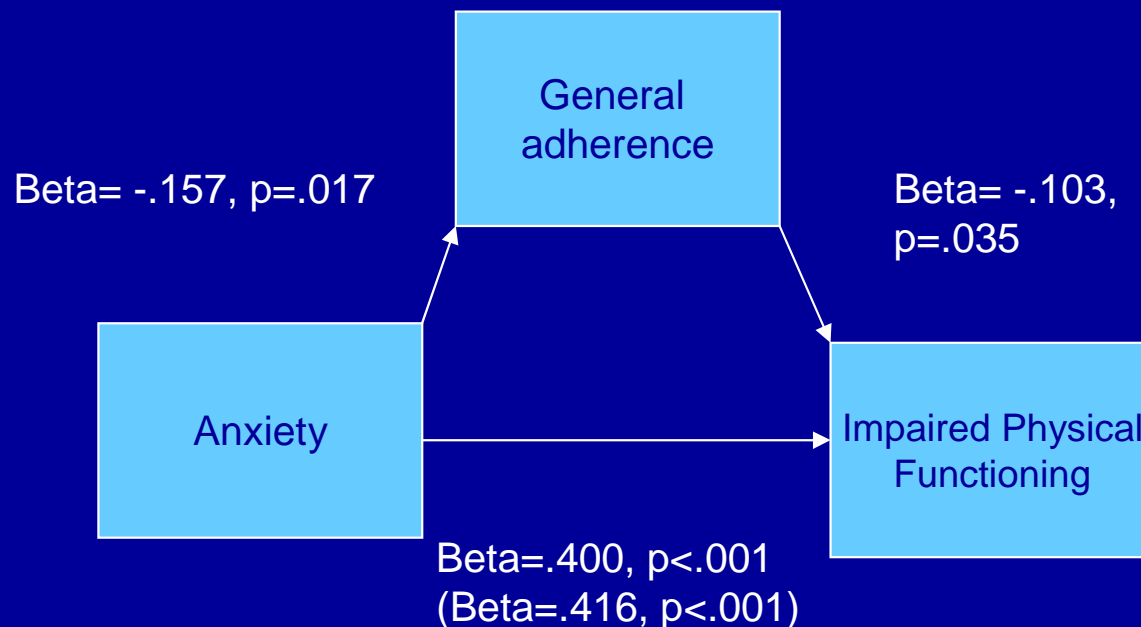
Block 1	β Model 1	β Model 2	β Model 3
BMI	1.68**	.10*	.09
Age	-0.09	.02	.02
Gender	0.01	.02	.01
Marital Status	0.07	.08	.08
Education	-0.05	-.02	-.03
Current Smoking	-0.15**	-.08	-.08
History of MI	1.66**	.11*	.10*
Mental Health Treatment	-0.05	-.07	-.06
NYHA class	0.46***	.40***	.42***
African American 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*
ΔR^2	0.35	0.15	0.01
F change	10.90***	35.03***	5.91*
Final R ²	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 ($r=.60$)