**PM-1 3 1/2" x 4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT**

PRECISIONSM RESOLUTION TARGETS

**The Relationship Between
Smoking Behaviour and Psychosocial Adjustment
Following Acute Myocardial Infarction**

by

JOAN KUHN, B.A. (Hons.)

**A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfilment of
the requirements for the degree of**

Master of Arts

Department of Psychology

Carleton University

Ottawa, Ontario

July, 1996

© copyright

1996, Joan Kuhn

National Library
of Canada

Acquisitions and
Bibliographic Services Branch

395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale
du Canada

Direction des acquisitions et
des services bibliographiques

395, rue Wellington
Ottawa (Ontario)
K1A 0N4

1-877-829-8463

1-877-829-8463

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-612-19437-X

Canada

Name JEAN KUHIN

Dissertation Abstracts International is arranged by broad, general subject categories. Please select the one subject which most nearly describes the content of your dissertation. Enter the corresponding four-digit code in the spaces provided.

Psychology - Behavioral

SUBJECT TERM

1 3 5 4

SUBJECT CODE

U·M·I

Subject Categories

THE HUMANITIES AND SOCIAL SCIENCES

COMMUNICATIONS AND THE ARTS

Architecture 0729
Art History 0377
Cinema 0900
Dance 0378
Fine Arts 0357
Information Science 0723
Journalism 0391
Library Science 0399
Mass Communications 0708
Music 0413
Speech Communication 0459
Theater 0465

EDUCATION

General 0515
Administration 0514
Adult and Continuing 0516
Agricultural 0517
Art 0273
Bilingual and Multicultural 0282
Business 0688
Community College 0275
Curriculum and Instruction 0727
Early Childhood 0518
Elementary 0524
Finance 0277
Guidance and Counseling 0519
Health 0480
Higher 0745
History of 0520
Home Economics 0278
Industrial 0521
Language and Literature 0279
Mathematics 0280
Music 0522
Philosophy of 0998
Physical 0523

Psychology 0525
Reading 0535
Religious 0527
Sciences 0714
Secondary 0533
Social Sciences 0534
Sociology of 0340
Special 0529
Teacher Training 0530
Technology 0710
Tests and Measurements 0288
Vocational 0747

LANGUAGE, LITERATURE AND LINGUISTICS

Language 0679
General 0289
Ancient 0290
Linguistics 0291
Modern 0401
Literature 0294
General 0295
Classical 0297
Comparative 0298
Medieval 0316
Modern 0591
African 0305
American 0352
Asian 0355
Canadian (English) 0593
Canadian (French) 0311
English 0312
Germanic 0315
Latin American 0313
Middle Eastern 0314
Romance 0578
Slavic and East European

PHILOSOPHY, RELIGION AND THEOLOGY

Philosophy 0422
Religion 0318
General 0321
Biblical Studies 0319
Clergy 0320
History of 0322
Philosophy of 0469
Theology

SOCIAL SCIENCES

American Studies 0323
Anthropology 0324
Archaeology 0326
Cultural 0327
Physical 0310
Business Administration 0272
General 0770
Accounting 0454
Banking 0338
Management 0385
Marketing 0501
Canadian Studies 0503
Economics 0505
General 0508
Agricultural 0509
Commerce-Business 0510
Finance 0511
History 0358
Labor 0366
Theory 0351
Folklore 0578
Geography 0578
Gerontology 0578
History 0578
General

Ancient 0579
Medieval 0581
Modern 0582
Black 0328
African 0331
Asia, Australia and Oceania 0332
Canadian 0334
European 0335
Latin American 0336
Middle Eastern 0333
United States 0337
History of Science 0585
Law 0398
Political Science 0615
General 0616
International Law and 0617
Relations 0814
Public Administration 0452
Recreation 0626
Social Work 0627
Sociology 0938
General 0631
Criminology and Penology 0628
Demography 0629
Ethnic and Racial Studies 0630
Individual and Family 0700
Studies 0344
Industrial and Labor 0709
Relations 0999
Public and Social Welfare 0453
Social Structure and 0537
Development 0538
Theory and Methods 0539
Transportation 0540
Urban and Regional Planning 0541
Women's Studies

THE SCIENCES AND ENGINEERING

BIOLOGICAL SCIENCES

Agriculture 0473
General 0285
Agronomy 0475
Animal Culture and 0476
Nutrition 0359
Animal Pathology 0478
Food Science and 0479
Technology 0480
Forestry and Wildlife 0817
Plant Culture 0777
Plant Pathology 0746
Plant Physiology 0306
Range Management 0287
Wood Technology 0308
Biology 0309
General 0329
Anatomy 0353
Biostatistics 0369
Botany 0793
Cell 0410
Ecology 0307
Entomology 0317
Genetics 0416
Limnology 0433
Microbiology 0821
Molecular 0778
Neuroscience 0472
Oceanography 0786
Physiology 0760
Radiation 0425
Veterinary Science 0996
Zoology 0996
Biophysics 0996
General 0996
Medical

Geodesy 0370
Geology 0372
Geophysics 0373
Hydrology 0388
Mineralogy 0411
Paleobotany 0345
Paleoecology 0426
Paleontology 0418
Paleozoology 0985
Palynology 0427
Physical Geography 0368
Physical Oceanography 0415

HEALTH AND ENVIRONMENTAL SCIENCES

Environmental Sciences 0768
Health Sciences 0566
General 0300
Audiology 0992
Chemotherapy 0567
Dentistry 0350
Education 0769
Hospital Management 0758
Human Development 0982
Immunology 0564
Medicine and Surgery 0347
Mental Health 0569
Nursing 0570
Nutrition 0380
Obstetrics and Gynecology 0354
Occupational Health and 0381
Therapy 0571
Ophthalmology 0419
Pathology 0572
Pharmacology 0382
Pharmacy 0573
Physical Therapy 0574
Public Health 0575
Radiology 0575
Recreation

Speech Pathology 0460
Toxicology 0383
Home Economics 0386

PHYSICAL SCIENCES

Pure Sciences 0485
Chemistry 0749
General 0486
Agricultural 0487
Analytical 0488
Biochemistry 0738
Inorganic 0490
Nuclear 0491
Organic 0494
Pharmaceutical 0495
Physical 0754
Polymer 0405
Radiation 0605
Mathematics 0986
Physics 0606
General 0608
Acoustics 0748
Astronomy and 0607
Astrophysics 0798
Atmospheric Science 0759
Atomic 0609
Electronics and Electricity 0610
Elementary Particles and 0752
High Energy 0756
Fluid and Plasma 0611
Molecular 0463
Nuclear 0346
Optics 0984
Radiation 0984
Solid State 0984
Statistics 0984
Applied Sciences 0984
Computer Science

Engineering 0537
General 0538
Aerospace 0539
Agricultural 0540
Automotive 0541
Biomedical 0542
Chemical 0543
Civil 0544
Electronics and Electrical 0348
Heat and Thermodynamics 0545
Hydraulic 0546
Industrial 0547
Marine 0794
Materials Science 0548
Mechanical 0743
Metallurgy 0551
Mining 0552
Nuclear 0549
Packaging 0765
Petroleum 0554
Sanitary and Municipal 0790
System Science 0428
Geotechnology 0796
Operations Research 0795
Plastics Technology 0994
Textile Technology

PSYCHOLOGY

General 0621
Behavioral 0384
Clinical 0622
Developmental 0620
Experimental 0623
Industrial 0624
Personality 0625
Physiological 0989
Psychobiology 0349
Psychometrics 0632
Social 0451

The undersigned recommend to the Faculty of Graduate Studies
and Research acceptance of the thesis

"THE RELATIONSHIP BETWEEN SMOKING BEHAVIOUR AND
PSYCHOSOCIAL ADJUSTMENT FOLLOWING ACUTE MYOCARDIAL INFARCTION"

submitted by Joan Kuhn, B.A. (Hons.)
in partial fulfilment of the requirements for
the degree of Master of Arts

Thesis Supervisor

Chair, Department of Psychology

Carleton University
August 29, 1996

Abstract

Forty patients admitted to the Ottawa General Hospital for confirmed diagnosis of acute myocardial infarction agreed to participate in this study. Assessment packages were given to patients to complete in-hospital and again two months post-discharge to gather information regarding smoking status, perceived and objective indices of health behaviour, and emotional adjustment.

Patients were identified as smokers, ex-smokers, and non-smokers based on a modified version of the Transtheoretical Model of Change and a series of analyses were performed to determine if groups differed with respect to sociodemographic variables, perceived and objective indices of health behaviour, defensiveness, and depression. While no differences were observed among the groups with respect to age, education, perceived health status, self-reported functional status, vulnerability to reinfarction, and maximum level of social intimacy experienced, two important findings did emerge from the data. Specifically, a one-way ANOVA found non-smokers to be considerably more defensive than smokers, and a one-way repeated measures ANCOVA found depressive symptomatology to be significantly higher among non-smokers than smokers and ex-smokers.

A standard multiple regression analysis intended to predict post-discharge depressive symptomatology from three in-hospital predictors (perceived health status, confidence in making lifestyle more heart healthy, and perceived risk of slipping into lifestyle behaviours that increase the risk for CHD) revealed that 31% of the variance in depressive symptomatology could be accounted for by these three variables. This finding underscores the importance of self-efficacy in well-being and quality of life.

Acknowledgements

I would like to begin by acknowledging the involvement of those individuals who made this research possible. First, my sincere appreciation to all of the patients who agreed to participate in this study, without whom there would be no data on which to report. Thanks also to my thesis advisor, Rob Nclan, and to my thesis committee, Joyce D'Eon, Adele Forth, Renée-Louise Franche, Mary Gick, Charlie Gordon and Bill Jones for seeing this long-term project through to completion. Thanks also to the staff of 5-West at the Ottawa General Hospital.

My deepest appreciation to Nancy, Janice, and Margaret who have given me their understanding and support over the last three years. Thanks also to Dominic and the staff at Bell Summer School. My appreciation also to Linda and Marjorie for allowing me to bounce ideas off of them.

To my family and friends...what can I say? There are no words that can express my gratitude. You have always encouraged and supported me. Thank you for believing in me...I love you all!

To Ian...thank you for your love, understanding, and support. This has been a very difficult four years and I appreciate everything that you have done to help me survive this experience.

. . .

This thesis is dedicated in memory of my father who passed away the week before my thesis defense... Although I regret not having completed this sooner so that you might have seen me achieve this goal, I know in my heart that somehow, someday you know and are proud of me. I love you, dad...

Table of Contents

Abstract.....	i
Acknowledgements.....	ii
Table of Contents.....	iii
List of Tables.....	vi
List of Figures.....	vii
 Introduction.....	 1
Incidence and Prevalence of Cardiovascular Disease.....	1
Lifestyle and Cardiovascular Disease.....	2
Smoking.....	3
Alcohol Use.....	3
Exercise and Diet.....	4
Type A Behaviour Pattern (TABP).....	4
Depression and Anxiety.....	5
Social Support.....	6
Relationship Among Risk Factors.....	9
Effects of Lifestyle Change.....	11
Understanding Smoking Behaviour.....	12
Theoretical Models of Behaviour Change.....	15
Theory of Reasoned Action.....	15
Transtheoretical Model of Change.....	17
Precontemplation.....	17
Contemplation.....	17
Prepared for Action.....	18
Action.....	18
Maintenance.....	18
Processes of Change.....	18
Group Differences.....	19
Psychosocial Adjustment and Outcome.....	20
Anxiety and Depression.....	21
Buffering Effects of Denial.....	25
Buffering Effects of Social Support.....	27
Summary of the Literature.....	28
Purpose of the Present Study and Statement of Hypotheses.....	31
Part A.....	31
Sociodemographics.....	32
Health Behaviour.....	32
Personality and Psychopathology.....	33
Social Intimacy.....	34
Part B.....	34
 Method.....	 36
Participants.....	36
Apparatus.....	39
Sociodemographic Questionnaire.....	39
Health Activity Inventory.....	40
Vulnerability to Reinfarction.....	41
Duke Activity Status Index (DASI).....	41

Table of Contents (continued)

Balanced Inventory of Desirable Responding (BIDR).....	42
Brief Symptom Inventory (BSI).....	43
Miller Social Intimacy Scale (MSIS).....	44
Confidence and Self-Efficacy.....	45
Procedure.....	46
Test Administration.....	46
Data Analysis.....	47
Results.....	49
Part A.....	49
Sociodemographic Variables.....	49
Gender.....	49
Marital Status.....	49
Age.....	50
Education.....	50
Health Behaviour.....	51
Body Mass Index and History of CHD.....	51
Perceived Health Status, Vulnerability to Reinfarction, and Self-Reported Functional Status.....	52
Personality and Psychopathology.....	55
Defensiveness.....	55
Depressive Symptomatology.....	56
Social Intimacy.....	59
Part B.....	62
Discussion.....	65
Part A.....	65
Sociodemographic Variables.....	65
Gender.....	65
Marital Status.....	66
Age.....	66
Education.....	67
Perceived and Objective Indices of Health Behaviour.....	67
Body Mass Index.....	67
Number of Previously Identified CHD Risk Factors.....	67
Perceived Health Status.....	68
Vulnerability to Reinfarction.....	68
Self-Reported Functional Status.....	69
Personality and Psychopathology.....	69
Defensiveness.....	70
Depressive Symptomatology.....	72
Social Intimacy.....	73
Part B.....	76
Limitations of this Study and Directions for Future Research.....	78
Defensiveness.....	80
Depressive Symptomatology.....	80
References.....	82

Table of Contents (continued)

Appendix A:	Verbal Instructions to Patient (In-hospital Visit).....	93
Appendix B:	Patient Information Sheet.....	94
Appendix C:	Informed Consent.....	95
Appendix D:	Sociodemographic Questionnaire.....	96
Appendix E:	General Health Survey	97
Appendix F:	Observed Change in Smoking Status	101
Appendix G:	Duke Activity Status Index.....	102
Appendix H:	Balanced Inventory of Desirable Responding.....	103
Appendix I:	Brief Symptom Inventory.....	106
Appendix J:	Miller Social Intimacy Scale.....	109
Appendix K:	Letter to Patients (Time 2 Questionnaire Package)....	111
Appendix L:	Patient Debriefing (Time 2)	112
Appendix M:	Summary of Results to be Sent to Participants.....	113
Appendix N:	Summary of Additional Hypotheses Regarding Social Desirability	114

List of Tables

Table	Description	Page
1	Demographic and Health Characteristics of Smoking Groups	38
2	One-Way ANOVA for Age	50
3	Means and Standard Deviations for Body Mass Index and History of CHD	51
4	Correlations Among Measures of Defensiveness and Perceived Health Status, Vulnerability to Reinfarction, and Self-Reported Functional Status	52
5	Means and Standard Deviations for Perceived Health Status, Vulnerability to Reinfarction and Self-Reported Functional Status	53
6	One-Way ANOVA for Self-Deceptive Enhancement	56
7	Correlations Among Measures of Defensiveness and Depressive Symptomatology	57
8	One-Way Repeated Measures ANCOVA for Depressive Symptomatology, Controlling for Social Desirability	58
9	Correlations Among Measures of Defensiveness and Social Intimacy	59
10	Repeated Measures ANOVA for Social Intimacy	60
11	Means and Standard Deviations for Social Intimacy	61
12	Correlations Among Targeted Predictor Variables and Time 2 Depressive Symptomatology	62
13	Regression Weights of In-Hospital Predictors of Post-MI Depressive Symptomatology	63
14	One-Way ANOVA for Impression Management	114
15	One-Way ANOVA for Total BIDR Score	114
16	Means and Standard Deviations for Impression Management and Total BIDR Scores	115

List of Figures

Figure	Description	Page
1	Causal Models of Correlations Between Stress, Support and Illness	8
2	Theory of Reasoned Action	16
3	Change in Stage of Change from Time 1 to Time 2 for the Smoking Group	101

Incidence and Prevalence of Cardiovascular Disease

Cardiovascular Disease (CVD) is comprised of acute myocardial infarction (AMI), ischemic heart disease (IHD), valvular heart disease, peripheral vascular disease, arrhythmias, high blood pressure, and stroke. In North America, it is the leading cause of death, accounting for almost half of all deaths each year (Nicholls, Nair, MacWilliam, Moen & Mao, 1986). CVD has been found to be the most common cause of death in men over the age of 40, and women over the age of 65 (Nicholls et al., 1986).

The Heart and Stroke Foundation of Canada (1993) reported CVD as being the major cause of death, disability, and illness in Canada accounting for 39% of all deaths. In 1990, IHD accounted for 58% of deaths from cardiovascular disease or 23% of all deaths (i.e. deaths from all causes, including cancer, accidents, etc.). More than half (55%) of IHD deaths, or approximately 13% of deaths from all causes, were attributable to AMI (Heart and Stroke Foundation of Canada, 1993).

Although CVD was once thought to be a "man's disease", it is estimated that almost as many women as men will die from this disease. In 1987, 40,977 men and 36,794 women died from CVD in Canada alone (Johansen, Nargundkar, Nair, Neutel & Wielgosz, 1990). Despite a steady decline in mortality due to coronary heart disease between 1969 and 1986, it remains the number one killer in both men and women (Wigle, Mao, Semenciw, McCann & Davies, 1990).

Due to the high incidence of CVD, researchers have been interested in identifying factors associated with an increased risk of contracting this deadly disease. Four major determinants of health that have emerged from this research include. lifestyle, genetics, the environment, and the health-care system (Lalonde, 1974). The main focus of this review will be on lifestyle factors associated with an increased risk of contracting heart

disease, since they are assumed to be modifiable by the individual. Genetics, environmental influences, and the health care system are assumed to be less controllable.

Lifestyle and Cardiovascular Disease

It has been suggested that the heaviest burden of illness in North America today is related to individual lifestyle behaviour (Hamburg, Elliott & Parron, 1982). Smoking, excessive consumption of alcohol, overeating and faulty nutrition, lack of exercise (Fitzgerald, Litt, Ciliska, Delmore & Butson, 1984; Sherk, Thomas, Wilson & Evans, 1985) stress, and either insufficient or excessive sleep (e.g. less than six or more than nine hours of sleep a night; Fitzgerald et al., 1984) have been found to have a considerable influence on well-being and health status.

Matthews (1989) suggested that sociodemographic variables such as age, ethnicity, gender, and occupational or educational status may also play a role in heightened risk of disease. Johansen and colleagues (1990) reported that while risk factors for CHD are the same for both men and women, not all apply with equal force to both genders. A follow-up analysis of mortality from the *Nutrition Canada Survey* that looked at three major risk factors for CHD (i.e. smoking, high blood pressure, and serum cholesterol) indicated that women had a lower risk of mortality due to CVD after 10 years than did men. Researchers concluded that a possible reason for this difference may be that these particular risk factors were originally found in men and that two of the stronger risk factors for women (i.e. decreased high density lipoproteins and diabetes) were not included. Also, at the time of the survey, smoking levels for women were lower than those for men.

Smoking

On the basis of several empirical studies, researchers have found coronary heart disease (CHD) to be the main cause of death among smokers, with the risk of mortality increasing as a function of the amount smoked and degree of inhalation (Ben-Shlomo, Smith, Shipley & Marmot, 1994; Epstein & Perkins, 1988; Lakier, 1992; Sherk et al., 1985). Canadian statistics for 1986 indicated that approximately one-third of all premature deaths (i.e. prior to the age of 75) due to cardiovascular disease were attributable to smoking (Wigle et al., 1990). The United States Department of Health and Human Services (cited in Epstein & Perkins, 1988) reported that, after controlling for other risk factors, cigarette smokers run almost twice the risk for CHD morbidity/mortality as non-smokers.

Alcohol Use

Although alcohol use has been identified as increasing the risk of premature death due to CVD, the impact it has is debatable. Shaper (1990) reviewed a number of prospective studies that looked at the relationship between alcohol and mortality. Conclusions drawn from these studies indicated that moderate to light drinking is beneficial to a person, while heavy drinking and abstinence increase the risk for CVD. Shaper disagreed with this interpretation of the findings, however. He argued that the researchers did not take into account what constituted a non-drinker. Specifically, Shaper argued that the non-drinking group in many of these studies included ex-drinkers, many of whom already had been diagnosed with CVD. This may have encouraged the drinkers to become non-drinkers. Other researchers ("Comments on Shaper's", 1990) support Shaper's interpretation. Nevertheless, the effect of alcohol

on CVD mortality will remain a mystery until studies are conducted that control for health status.

Exercise and Diet

Fitzgerald and colleagues (1984) found that people who are physically active have a lower incidence of MI and mortality from CHD. These authors also found physically active individuals to have improved body image and self-esteem. Conversely, obesity has been shown to increase the risk of CVD, hypertension, hyperglycemia, diabetes mellitus, and hyperlipoproteinemia (Fitzgerald et al., 1984). Serum cholesterol levels can be reduced by reducing one's weight and limiting the amount and type of fat consumed.

Type A Behaviour Pattern (TABP)

Characterized by aggressiveness, easily aroused hostility, a sense of time urgency, and competitive drive, the TABP is considered to be just as important in the cardiovascular disease process as elevated systolic blood pressure and serum cholesterol, and smoking (Matthews, 1988; Sherk et al., 1985). Recent evidence, however, suggests that it is not the global TABP that predicts a coronary event, but rather the hostility component (Booth-Kewley & Friedman, 1987; Dembroski, MacDougall, Costa & Grandits, 1989; Goldstein & Niaura, 1992; Matthews, 1988). While the exact relationship between hostility and/or the TABP and CVD is not well understood, it does appear that the TABP is related to initial but not recurrent AMI (Corse, Manuck, Cantwell, Giordani & Matthews, 1982; de Leo, Caracciolo, Berto, Mauro, Magni & Miraglia, 1986; Goldstein & Niaura, 1992).

Depression and Anxiety

For a significant proportion of AMI patients, depressive symptoms predate the AMI (Fielding, 1991). In a meta-analytic review of prospective studies that looked at relationships between psychological factors and CHD, Booth-Kewley and Friedman (1987) found depression and anxiety to be significant predictors of CHD, with combined effect sizes of 0.168 and 0.136, respectively. Employing the same method used by Booth-Kewley and Friedman, Matthews (1988) conducted a meta-analytic review of the most recent prospective studies that looked at the relationship between the incidence of CHD and depression and anxiety. In this review, Matthews weighted studies according to the number of participants, thereby controlling for previous findings that effect sizes varied by sample size (Booth-Kewley & Friedman, 1987). Results indicated that: (i) depression is not significantly related to the incidence of CHD (weighted combined $z = 0.29$), and (ii) anxiety is related to the incidence of CHD (weighted combined $z = 2.58$). It should be noted, however, that the calculations in both of these reviews were based on very few published studies (i.e. three and two, respectively).

After reviewing the literature, Goldstein and Niaura (1992) concluded that there are simply too few prospective studies that look at the relationship between CHD and depression and/or anxiety to make any conclusive statements. These researchers point out that while patients with a major depressive disorder are at an increased risk for cardiovascular morbidity and mortality, evidence linking depressive symptoms and CAD are not consistent (Niaura & Goldstein, 1992).

Social Support

Social support is a complex phenomenon that can essentially be divided into two main categories: (i) structural support, and (ii) functional support (Cohen, 1988). Structural support refers to measures describing the existence of and relationships between social ties, for example, marital status, close family and friends, participation in group activities, and church or religious affiliations. Functional support refers to the actual function that the relationship serves, such as affection, providing a sense of belonging, or material aid. Common measures of functional support include satisfaction with one's social supports and perceived availability of support (Cohen, 1988).

Different definitions of social support used by researchers make it extremely difficult to make comparisons between studies. This makes it difficult to determine whether social support influences onset, progression, or recovery from disease (Cohen, 1988; Schwarzer & Leppin, 1991).

In a review of the literature, Cohen (1988) found evidence to suggest that social integration and perceived availability of support are predictive of disease and mortality. Specifically, research in the area of CHD has found: (i) less atherosclerosis in people who had greater instrumental support available, as compared to their unsupported counterparts; and (ii) less emotional support among Type A's and more emotional support among Type B's to be related to greater coronary artery occlusion. Cohen (1988) also stressed that structural components of the social network, such as density, reciprocity, dispersion and qualitative aspects of perceived and/or received support, may also play a key role in the disease process. Sherk and colleagues (1985) found that the ability to use available social support and establish meaningful relationships affected both physical and psychological well-being prior to disease onset.

Schwarzer and Leppin (1991) proposed four causal models of correlations between stress, support, and illness (see Figure 1 on the following page) to help illustrate the point that any kind of correlation (positive or negative) in social support research can be meaningful. Model 1 is more indicative of the main effect model, whereas Models 2, 3, and 4 lend themselves more to the buffering hypothesis.

Model 1:

Stressful situations motivate people to seek support from others and, if granted, support will prevent disease or illness onset.

Model 2:

Stress motivates people to seek support from others, but it also leads to illness; support from others reduces the severity of the illness.

Model 3:

Stress leads to illness, but illness must be present before the support network is activated.

Model 4:

The combination of stress and illness may activate the support network, which facilitates recovery from illness.

Figure 1. Causal Models of Correlations Between Stress, Support, and Illness

NOTE: Adapted from Schwarzer, R. & Leppin, A. (1991). Social support and health: A theoretical and empirical overview. *Journal of Social and Personal Relationships*, 8, 99-127.

Cohen and Wills (1985) reviewed a number of articles to determine whether the positive association between social support and well-being is attributable more to an overall beneficial effect of support (i.e. main effect model) or to a process of support protecting people from potentially adverse effects of stressful events (i.e. buffering model). These researchers concluded that social integration has a beneficial effect regardless of whether or not the individual is under stress (i.e. main effect model), whereas perceived availability of support acts more as a buffer against potentially stressful events.

Relationship Among Risk Factors

Research has identified many relationships among the risk factors associated with CVD. The TABP has been found to be related to depressive mood and tension (Dimsdale, Hackett, Block & Hutter, 1978). Singer (1987) reported a relationship between social support and TABP suggesting that an individual's ability to share intimate concerns with others might be compromised because of Type A traits possessed by the person and/or by overutilization of defense mechanisms such as denial and rationalization.

Demobroski and colleagues (1989) showed a positive correlation between hostility and smoking. Specifically, highly hostile individuals were found to smoke more than their less hostile counterparts. Houston and Vavak (1991) and Singer (1987) found similar relationships between hostility and: (i) alcohol consumption; (ii) low levels of physical exercise; and (iii) avoidance in seeking or accepting social support. Goldstein and Niaura (1992) cited studies that found a relationship between hostility and certain demographic characteristics (i.e. non-white race, low socioeconomic status, male gender, and low education level).

Researchers have also reported an association between smoking and depression. Haire-Joshu, Heady, Thomas, Schechtman and Fisher (1994) found depressive symptomatology among diabetics, as assessed by the BDI, to be more prevalent and severe among smokers than non-smokers. Hall, Munoz, Reus and Sees (1993) reviewed the literature regarding smoking cessation and depression/negative affect. These researchers concluded that depression is in fact more prevalent among smokers than non-smokers. Furthermore, depressed smokers are: (i) less likely to quit smoking compared to non-depressed smokers, and (ii) if they do manage to quit, they appear to experience more withdrawal symptoms, and are more likely to relapse than non-depressed smokers who have quit. Parchman (1991) found the prevalence of depression to be significantly higher in current smokers (24.1%) than in non-smokers (15.3%), $\chi^2 (1) = 8.25$. Furthermore, current smokers had significantly higher depression scores, as assessed by the Beck Depression Inventory, compared to non-smokers. This finding was independent of age, marital status, education, and employment status.

Woodward, Bolton-Smith and Tunstall-Pedoe (1994) found an association between smoking and: (i) diet, and (ii) body mass index. Compared to non-smokers, smokers had lower: (i) HDL-cholesterol, (ii) body mass index, (iii) vitamins C and E intake, and (iv) fibre intake; and higher intake of: (i) salty foods, (ii) dietary cholesterol, and (iii) alcohol.

Cohen (1988) suggested that the social networks to which people belong may have an impact on the behaviours, such as smoking, in which people engage. For example, people who are surrounded by smokers are more likely to smoke. Niaura and Goldstein (1992) concluded that low levels of social support appear to interact with life stress, job strain, and the TABP to increase the risk for CAD events.

It is evident that the relationship among risk factors for CVD is complex, making it difficult to tease out the variables that have the greatest impact on the disease process. Studying the effects of modifying these behaviours may shed some light on this issue.

Effects of Lifestyle Change

Because lifestyle has such a profound effect on the disease process, researchers have been interested in determining what the effects would be if these risk factors were reduced. Research suggests that not smoking cigarettes, moderate to no use of alcohol, exercising regularly, maintenance of a desirable weight in relation to height, and sleeping seven to eight hours each night have a strong, positive relationship with good health, thereby decreasing the risk of disease and mortality. It has been estimated that 54% of the decline in ischemic heart disease between 1968 and 1976 can be attributed to lifestyle changes involving a reduction in serum cholesterol levels and cigarette smoking (Goldman & Cook, 1984). Wigle and colleagues (1990) reported that more than half of the estimated 100,000 premature deaths each year in Canada could be prevented through the control of cigarette smoking, hypertension, cholesterol, adult onset diabetes, and excessive alcohol consumption.

The United States Department of Health and Human Services (cited in Epstein & Perkins, 1988) reported that smoking cessation may have a greater effect in reducing the risk of CHD than changes in any other risk factor. The Ontario Ministry of Health (1991) reported that, among smokers, the risk of contracting CVD is reduced by about half within the first year following smoking cessation. Evidence suggests that smoking cessation following a heart attack significantly reduces the risk of subsequent morbidity and mortality due to coronary events (Aberg, Bergstrand, Johansson, Ulvenstam, Vedin, Wedel, Wilhelmsson & Wilhelmsen, 1983; Daly, Mulcahy, Graham & Hickey, 1983;

Mulcahy, 1983). After 10 to 15 years of abstinence, the risk of mortality for former smokers approaches that of non-smokers (Kawachi, Colditz, Stampfer, Willett, Manson, Rosner, Hunter, Hennekens & Speizer, 1993; Lakier, 1992; Ontario Ministry of Health, 1991; Sherk et al., 1985).

Hirdes and Maxwell (1994) found evidence to suggest that among older adults (i.e. those aged 65 and over), the benefits of smoking cessation are not limited to reduced mortality. These researchers observed that ex-smokers of 11 or more years had risks comparable to those of never-smokers for such quality of life outcome measures as poor self-rated health, limitations in activity level or types of activities that could be performed, trouble bending, and hospitalization within the last year.

Understanding Smoking Behaviour

Despite the extensive literature concerning the hazardous effects of poor lifestyle on health, people still tend to engage in these health risk behaviours (Jeffery, 1989). It is important, therefore, to understand why people choose to engage in behaviours that put them at an increased risk for disease.

A 1994 survey of Canadians showed that 31% of Canadians aged 15 and over smoked, while 27% of Canadians were ex-smokers (Health Canada, 1994). Smoking was found to be most common among lower income and lower educated individuals, and those who were separated or divorced. In all age groups, with the exception of 15- to 19-year-olds, men were more likely to smoke than women. For smokers who had made a quit attempt, the most frequently reported reasons for resuming smoking were: (i) to relax, (ii) family and/or friends smoke, (iii) to combat boredom, and (iv) to control weight.

Gilbert and Wesler (1989) found that people who smoke report doing so because it improves their affective state by reducing negative and/or increasing positive affect. Without access to cigarettes, smokers often experience irritability, tension and nervousness. Smoking cigarettes seems to calm and reduce feelings of anxiety and anger. West (1993) argues, however, that while many smokers believe cigarettes enhance their lives and/or help them cope with stress, there is no clear evidence to support this. Foulds ("Comments on West's", 1994) reported that many studies have found mood to worsen immediately after cessation of smoking, and to return to baseline levels within three to four weeks. At ten weeks, abstinent subjects have been found to report a better mood than during smoking.

Manning, Osland and Osland (1989) conducted a study of non-smokers ($n = 206$), smokers ($n = 96$), ex-smokers ($n = 86$), and people who quit smoking during the course of the study ($n = 34$) to test the hypotheses that: (i) smoking cessation significantly alters mood, and (ii) people who stop smoking have lower health appraisals than do non-smokers and smokers. One hundred and thirty-eight men and 284 women between 20 and 75 years of age ($M = 35.2$, $SD = 9.41$) were surveyed on two occasions, 12-16 months apart. Eighteen items measuring depression, anxiety, and somatic complaints were rated on a five-point scale from rarely or never to quite frequently. While no relationships were found between age, education, marital status, and smoking category, there was a relationship between smoking category and gender. Specifically, fewer women were found to be long-term ex-smokers and to quit smoking during the course of the study. A MANOVA performed on 12 dependent variables for Time 1 revealed significant differences between smoking groups. Nevertheless, univariate analyses revealed no differences in terms of depression, anxiety, and somatic complaints. At Time 2, significant differences were observed between the groups even

after controlling for Time 1 scores. Univariate analyses revealed that, compared to long-term ex-smokers and continuous smokers, recent ex-smokers reported: (i) more depression, $F(3,418) = 6.15$, (ii) higher levels of anxiety, $F(3,418) = 5.00$, and (iii) greater negative affect, $F(3,418) = 4.85$. Health appraisals were also found to be significantly lower for recent ex-smokers than for long-term ex-smokers and non-smokers, $F(3,418) = 5.48$. These results indicate that smoking is related to negative affect and poor health appraisals. Similarly, Halpern and Warner (1994) observed poorer health appraisals among former smokers and current smokers, compared to non-smokers. Health appraisals of former smokers who had not smoked for at least 20 years were not significantly different from never-smokers.

Marshall (1990) set out to identify specific attitudes and characteristics that differentiate between smokers (i.e. those smoking at least one cigarette per day upon admission to the hospital for an initial MI) and ex-smokers (i.e. those who quit smoking after their heart attack and who maintained non-smoking status three months later). Forty-three patients, 37 men with a mean age of 54 ($SD = 8$) and six women with a mean age of 55 ($SD = 5$) were asked to complete a self-report questionnaire that dealt with various aspects of smoking behaviour and health beliefs. Results from this study revealed significant attitudinal differences between individuals who stop smoking and those who continue to smoke following an MI. Specifically, individuals who continued smoking after their MI had a more positive attitude towards smoking than did individuals who maintained ex-smoking status. The researchers concluded that the decision to continue to smoke after an MI appears to be a balanced decision weighing the pros and cons of smoking.

Richmond ("Comments on West's", 1994) proposed that smoking may be a symbol of belonging to a particular social, cultural or occupational group. Specifically, it was

suggested that people may smoke because those around them smoke. This is consistent with Cohen (1988).

Theoretical Models of Behaviour Change

A number of researchers have developed models or theories that help to explain why people engage in health risk behaviours and what factors enable them to change.

Theory of Reasoned Action

Fishbein and Ajzen (Fishbein, 1979) proposed that a person's intention to perform, or not perform, a behaviour is dependent upon his/her attitude towards the behaviour (i.e. attitudinal belief) and other's perceptions of the behaviour (i.e. subjective norm). These two factors are assumed to combine in an additive manner, although they are weighted differently depending upon the individual and the situation, to predict behavioural intention. These authors further propose that attitudinal beliefs are determined by an individual's beliefs regarding the possible consequences of engaging in a particular behaviour, while the subjective norm reflects a person's beliefs about what significant others believe. Other factors, such as personal traits and demographic variables are assumed to have an indirect influence on one's intention to engage in a particular behaviour (see Figure 2).

Many studies have used the Theory of Reasoned Action as a model to study smoking behaviour, although subjects were categorized as smokers and non-smokers (i.e. non-intenders vs. intenders).

Criticisms of the Theory of Reasoned Action include: (i) the apparent overlap of attitudinal beliefs and subjective norms since they are both viewed from one individual's perspective, (ii) problems with the interpretation of the weighting of attitudinal beliefs

and subjective norms, and (iii) other variables, such as current and past behaviour and social structure, may have a direct influence on one's intention to engage in a particular behaviour, but they are not taken into account with this model. The major breakthrough of this model, however, is the measurement of personal rather than general beliefs and attitudes (Sutton, 1989).

Figure 2. Theory of Reasoned Action

NOTE: Taken from "A Theory of Reasoned Action: Some Applications and Implications" by M. Fishbein, 1979, *Nebraska Symposium on Motivation*, p. 69.

Transtheoretical Model of Change

The Transtheoretical Model of Change proposed by Prochaska and DiClemente (1992) provides a means for understanding why individuals engage in health-risk behaviours and what encourages them to change. Although other models provide important and insightful information into the area of health behaviour and behaviour change, the model outlined by Prochaska and colleagues provides additional information that allows researchers to examine not only the stages of change but also the processes of change. The Transtheoretical Model of Change (Prochaska & DiClemente, 1992) consists of five discrete stages of change which represent specific constellations of attitudes, intentions, and/or behaviour(s).

Precontemplation. This first stage of behaviour change is characterized by either ignorance as to the harmful effects of the problem behaviour or an unwillingness to change. Individuals at this stage of change tend to be defensive about their problem behaviour and are not convinced that the negative aspects of the behaviour outweigh the positive. In order to move to the next stage of change, Contemplation, the individual must acknowledge or take ownership of the behaviour, increase his/her awareness of its negative aspects, and accurately evaluate his/her capacity for self-regulating the behaviour.

Contemplation. Individuals who are contemplating change are actively considering altering their problem behaviour(s). These individuals tend to seek out information and re-evaluate themselves in light of the behaviour. Contemplators also evaluate the pros and cons that successful change would bring. Nevertheless, individuals at this stage of change are not prepared to take action at the present time. In order to move to the

Preparation stage, Contemplators must make a firm decision to take action and make a preliminary attempt to change.

Prepared for Action. Individuals at this third stage of change are intending to change their behaviour in the near future, and have made previous attempts at altering their behaviour. In order to move into the Action stage, these individuals must make firm commitments to change their behaviour and follow through on these commitments.

Action. This stage is characterized by overt modification of the problem behaviour. Individuals in the Action stage must use their skills to interrupt their pattern(s) of problem behaviour and adopt more productive ones. These individuals must also be aware of factors that could impede their continuation of the action phase. Individuals at this stage of change need effective strategies to prevent them from relapsing.

Maintenance. This final stage of change is characterized by at least a six month withdrawal from the problem behaviour.

Processes of Change. In addition to these five stages of change, the Transtheoretical Model of Change also identifies 10 processes of change by which people progress through the five stages of change (Prochaska, Velicer, DiClemente & Fava, 1988) that represent coping strategies employed by people to modify their smoking, or other problem behaviour: (i) consciousness raising, (ii) self-liberation, (iii) dramatic relief, (iv) environmental reevaluation, (v) helping relationship, (vi) stimulus control, (vii) counterconditioning, (viii) social liberation, (ix) self-reevaluation, and (x) reinforcement management.

Group Differences. DiClemente and colleagues (1991) conducted a large-scale study of the stages and processes of change in order to determine if there were significant differences among individuals at the various levels of behaviour change. No significant differences in age, education, and/or gender were found among precontemplators, contemplators, and individuals prepared for action. In a large national Canadian study (Health Canada, 1995), however, smokers in the precontemplation, contemplation, and preparation stages were found to differ with respect to these attributes. Specifically, smokers in the precontemplation stage were more likely to be female than male, to be aged 65 and over, and to have little formal education, whereas smokers who were contemplating or preparing to quit were more likely to be male than female, to be aged 15 to 19, and to be university graduates. Kviz, Clark, Crittenden, Warnecke and Freels (1995) found somewhat of the opposite trend, with younger smokers (18-29 years) most likely to be in the contemplation stage and older smokers (50 years and over) to be in the preparation stage, $\chi^2 (4) = 18.78$. Reasons for these differences in findings are unknown. One possible explanation may be that different smoker characteristics are observed in different geographic regions. In the Canadian study (Health Canada, 1995), differences among the provinces with respect to readiness to quit smoking were observed. Specifically, of the smokers living in a province where federal and provincial tobacco taxes were lowered in February 1994, 42% were contemplating or preparing to quit smoking, compared to 54% of smokers where there was no reduction.

With respect to confidence in either stopping or maintaining a non-smoking lifestyle, individuals prepared for action report significantly higher levels of confidence than Precontemplators or Contemplators. At a one-month follow-up, a greater proportion of individuals in the prepared for action stage were found to have made a

quit-attempt. Other research that has looked at the effect of confidence/self-efficacy in smoking cessation has found this to be an important factor in the maintenance of a non-smoking lifestyle (Prochaska, 1989; Prochaska & DiClemente, 1984; Velicer, DiClemente, Rossi & Prochaska, 1990).

The major difference between this and other stage models is the fact that a smoker does not become a non-smoker or an ex-smoker instantly. In fact, a smoker does not exit this system until he/she has maintained a non-smoking lifestyle for at least five years.

Not only is it important to understand why people continue to behave in a manner that is known to be hazardous to one's health, but also to see if this behaviour has a negative impact on psychosocial adjustment following the onset of an AMI.

Psychosocial Adjustment and Outcome

Physical discomfort, medical/self-care, work, social, and financial concerns seem to be the most prominent complaints identified by AMI patients (Bennett, 1992; Hotz, Cazabon, O'Farrell & Robbins, 1991). Lifestyle change, alterations in patterns of family interaction, and the fear of dying from overexertion and/or stress have also been identified as problems these individuals must face (Singer, 1987). Increased anxiety and emotional distress are high in this population because individuals have no clear idea of how much activity is safe to perform (Christman, McConnell, Pfeiffer, Webster, Schmitt & Reis, 1988; Kaufman, Psacreta, Cheney & Arcuni, 1985-86; Singer, 1987). Cardiac patients often suffer more severe psychologic distress after discharge from the hospital than during their hospital stay (Doehrman, 1977). Cronin (1990) reported that an individual's response to coronary illness may be a product of his/her

own perception of health status. Specifically, the presence of physical symptoms, such as chest pain and fatigue, may lead to the perception of poor health.

Blumenthal and colleagues (1989) stressed that while the cardiac patient is not typically a psychiatric patient, there is a need to assess psychological status since the MI patient has experienced a significant change in health status that will affect his or her ability to function psychologically, socially and behaviourally.

Anxiety and Depression

Cronin (1990) reported that anxiety and depression are the most common psychologic responses experienced by patients on return home, but that emotional distress decreases over time. Fielding (1991) suggested that depressive symptoms following an AMI may be more of a reaction to hospitalization than to the actual heart attack.

Hotz and colleagues (1991) reported that up to one-third of MI patients will experience depression and/or anxiety six months following the attack, and 50% of patients complain of irritability, tension, hostility, excessive fatigue, or other symptoms of affective distress one year following the MI. Wiklund, Sanne, Vedin and Wilhelmsson (1984) found emotional distress among 177 initial MI patients to be apparent two months post-infarction, and to remain relatively stable at a one-year follow-up.

Trelawney-Ross and Russell (1987) interviewed 32 married men under the age of 65 admitted to hospital with either confirmed or possible AMI or angina. Patients were interviewed on four occasions: (i) in-hospital, (ii) 10 days post-discharge, (iii) two months post-discharge, and (iv) six months after admission. Information regarding smoking habits, life events, mental state, work and leisure activities, exercise, anxiety,

depression, and work expectations was gathered during the interviews. Results indicated that psychological symptoms, such as anxiety and depression, and somatic symptoms did not change significantly over time. Nevertheless, these researchers did report a peak in anxiety at the two month follow-up. At six months post-discharge, 42% of these patients complained of chest pain, breathlessness, and fatigue; 33% complained of moderate to severe anxiety; and, 26% complained of depression. Furthermore, having physical symptoms was found to be correlated with depression ($r = 0.425$) and with continued smoking ($r = 0.433$).

Griego (1993) also conducted research with MI patients, although it was over a longer period of time (i.e. 10 to 14 months after the infarct). The 21 subjects included in the study, 15 men and six women, were between 42 and 80 years of age, had no previous history of psychiatric disorders, were not taking mood-altering medication at the time of the study, had no diagnosis of chronic obstructive pulmonary disease, and had been non-smokers for at least one year. Instruments used in the assessment of these patients included: (i) the Zung SDS to assess depression, (ii) Kellner's Symptom Questionnaire to assess depression and somatic symptoms, and (iii) the Duke-UNC Health Profile to measure functional status. Mann-Whitney U and Kruskal Wallis tests revealed no significant difference in depression scores for marital status, education, income, type of infarct, or location from where the patient was recruited. The author does point out, however, that the small groups (i.e. in some cases, two or three subjects) may have made it difficult to detect statistically significant differences. Spearman rho correlations indicated significant relationships between: (i) somatic symptoms and depression ($r = 0.63$), and (ii) functional status and depression ($r = -0.76$). Griego reported that subjects exhibiting depressive symptoms were

found to have more somatic complaints, such as fatigue, weakness, bodily aches and pains, headaches, shortness of breath, palpitations, and insomnia.

Thompson and colleagues (1987) also conducted research with men hospitalized for an AMI. Seventy-six men between 39 and 65 years of age were asked to rate their level of anxiety (from 1 = no anxiety, to 7 = extreme anxiety) with respect to: (i) the MI, (ii) possible complications, (iii) the future, (iv) return to work, (v) leisure activities, (vi) relations with others, and (vii) sexual activities. The men were interviewed on four occasions: (i) 24 hours after admission, (ii) five days after admission, (iii) six weeks post-discharge, and (iv) one year post-discharge. A statistically significant difference in self-reported anxiety among the four testing times, $\chi^2 (3) = 105.1$, was observed with a reduction in anxiety from the first day to pre-discharge, followed by an increase at six weeks post-discharge. After one year, anxiety levels fell considerably.

Together these findings provide some evidence that depression following an AMI is not necessarily a reaction to hospitalization. The fact that mental state and/or previous history of psychiatric disorders were taken into account and that depression and/or anxiety persisted over a long period of time indicates that these emotions are experienced, at least in part, as a result of the AMI and not just hospitalization.

If not dealt with, anxiety can lead to lethal arrhythmias, exacerbate pain, worsen heart failure, disrupt sleep, and contribute to the development of delirium (Kaufman et al., 1985-86). Wiklund, Oden, Sanne, Ulvenstam, Wilhelmsson, and Wilhelmssen (1988) found somatic, social and psychological variables to be related to death, non-fatal reinfarction, and total events (i.e. the sum of all deaths and non-fatal reinfarctions) in a sample of 201 initial MI patients. A number of researchers (Frasure-Smith, Lespérance & Talajic, 1993; Ladwig, Kieser, König, Breidhardt &

Borggrefe, 1991; Lespérance, Frasure-Smith & Talajic, 1996) found evidence to suggest that depression is an independent risk factor for mortality six months after an MI.

In the research conducted by Frasure-Smith and colleagues (1993; Lespérance et al., 1996), 222 patients admitted to the Montreal Heart Institute between August 1991 and July 1992 were interviewed to gather sociodemographic data (e.g. education, living arrangements, and social relationships) and information regarding smoking status and depressive symptoms. Baseline clinical data such as previous MI, the use of prescription and non-prescription medication, and severity of the infarct was also obtained. Follow-up contacts were made six months post-MI to determine survival status.

In the first study (Frasure-Smith et al., 1993), no significant differences were observed between depressed and non-depressed patients in hospital with respect to age, education, living arrangements, smoking status, physical activity, family history of CHD, previous personal history of MI, or severity of the infarct. Results indicated, however, that depression was significantly related to six-month mortality (Cox model hazard ratio of 5.74, 95% confidence interval of 4.61 to 6.87). This risk was not associated with disease severity and previous history of MI (adjusted hazard ratio of 4.29, 95% confidence interval of 3.14 to 5.44).

In study two (Lespérance et al., 1996), additional interviews were conducted at six and 12 months post-MI. At 18 months, patients or family members were contacted to determine survival status. The finding that sleep and appetite disturbances were common in both depressed and non-depressed patients (sleep: 66% and 50%, respectively; appetite: 80% and 71%, respectively) led researchers to eliminate this symptom from the definition of depression in order to determine if the impact that

depression had on mortality would change. Reclassification of patients using the modified definition indicated that the prediction of mortality by depression gains some power by removing prevalent in-hospital complaints from its definition. The revised odds ratio for: (i) six-month mortality was 7.40; (ii) one-year mortality was 5.28; and, (iii) 18-month mortality was 4.76. Results from this study also found that a significantly lower proportion of patients who were depressed in-hospital (26%) than of non-depressed patients (72%) were depression-free at the six-month follow-up.

Researchers attempted to use baseline characteristics (i.e. scores of mild depression from the Beck Depression Inventory (BDI), age, history of depression, and number of DSM-III-R symptom clusters) to predict who is at risk for post-discharge depression. While all four predictors were found to make independent contributions to the prediction of post-discharge depression, only 15% of patients developing depression after discharge were correctly identified. Researchers concluded that patients who become depressed after discharge cannot be easily identified using clinical variables assessed in hospital.

It is evident from the research that depression is a serious concern for MI patients, and that it can have a great impact on both quality of life and mortality. Other areas of research have attempted to identify variables that have potential buffering effects on distress/depression; the two most widely studied are denial and social support.

Buffering Effects of Denial

Denial of illness may act as a buffer against distress (Dimsdale & Hackett, 1982; Esteve, Valdés, Riesco, Jódar & de Flores, 1992; Levine, Warrenburg, Kerns, Schwartz, Delaney, Fontana, Gradman, Smith, Allen & Cascione, 1987; Warrenburg, Levine, Schwartz, Fontana, Kerns, Delaney & Mattson, 1989).

Esteve and colleagues (1992) found that among 67 male patients suffering from their first MI, those who were considered to be high deniers, as compared to low deniers, showed less anxiety and depression both in the coronary care unit (CCU) and one month later. At a one-year follow-up, however, no significant differences between these two groups were observed. Levine and colleagues (1987) and Warrenburg and colleagues (1989) also found high levels of denial to be adaptive in the short-term, as evidenced by fewer days spent in intensive care and fewer signs of cardiac dysfunction. Contrary to the study by Esteve and colleagues (1992), these two studies found that high levels of denial resulted in poorer adaptation, as evidenced by noncompliance with medical regimen and more days of hospitalization in the year following the heart attack compared to individuals engaged in lower levels of denial.

One possible explanation for the discrepancy in findings between these studies may be that different measures of outcome were being used. Whereas Esteve and colleagues studied the impact of denial of illness on cardiac status and whether or not the patient had received psychiatric or psychological treatment in the year following the MI, Levine and colleagues assessed medical charts of patients for: (i) presence or absence of hospitalization for cardiac conditions, (ii) number of days hospitalized for cardiac conditions, and (iii) number of cardiac outpatient visits. Another possible explanation for the difference in findings is the definition of, and measure used to assess denial of illness. In fact, Havik and Maeland (1988) found evidence to suggest that different forms of denial may have a different impact on outcome. Specifically, these researchers found that in a sample of 367 MI patients: (i) low levels of denial of illness, defined as verbal repudiation of illness and of the need for treatment, were associated with more problems related to work, sexual life, and physical activity, and higher mortality rates; and, (ii) higher levels of denial of impact, defined as verbal repudiation of anxiety

related to the illness episode and of apprehension due to recurrences of chest symptoms, were related to better emotional outcome and increased mortality.

From these studies, it is evident that some forms of denial, such as denial of illness and to an extent denial of impact, may be beneficial in the short-term recovery from an MI.

Buffering Effects of Social Support

Social support may also act as a buffer against distress. Studies reviewed by Hotz and colleagues (1991) indicated that cardiac patients having highly intimate relationships tended to have lower levels of depression and anxiety, while high levels of marital conflict were found to be a predictor of poor adjustment. Cohen and Wills (1985) have suggested that functional support (i.e. perceived availability) acts as a buffer against stress, leading to more positive affect.

Ell and Haywood (1984) conducted a study that focused on social support and recovery from an MI. Patients were interviewed during hospitalization ($N = 114$), six months later ($N = 75$), and one year later ($N = 60$). Measures used during the interviews included the: (i) Recent Life Change Questionnaire to assess life events prior to the MI (Time 1); (ii) Norris Coronary Prognostic Index to assess cardiac dysfunction and prognosis (Time 1); (iii) Coping with Serious Illness Battery to assess social network resources, social support, sense of control, coping responses, and outcomes (Time 2 and 3); and (iv) family APGAR Index (used to assess: adaptation, partnership, growth, affection, and resolve; Time 2 and 3).

Results from this study indicated that pre-illness stressful events, marital status, and number of people living in the household, were not correlated with psychological, functional, or physiological outcomes. Modest associations were found between social

support from the family and: (i) depression ($r = -.23$), and (ii) anxiety ($r = -.20$). These researchers concluded that confiding in those to whom one is close, and receiving both understanding from others and family support may aid in reducing depression and anxiety, and enhance well-being. It was further argued that perceived support is more strongly associated with functional and psychological outcomes than indirect support measures, such as marital status. Similarly, Schwarzer and Leppin (1991) proposed that while marital status can serve as a social indicator of disease, the perception of spouse's availability, behaviours, and intentions, and the nature of those social interactions can be seen as potential causal determinants of affect, coping, and symptomatology.

Waltz, Badura, Pfaff and Schott (1988) conducted a longitudinal study of 400 male MI patients and their wives to determine if patient cognitions and marital factors have an impact on long-term psychological adjustment. Data was gathered five times over the five year period (two weeks, six months, one year, three-and-a-half to four years, and five years post-MI) regarding marital problems and intimacy, health status, and anxiety and depression. Results from this study indicated that the level of intimacy between spouses was inversely related to level of depressed mood.

Findings from these studies are consistent with the viewpoint of Cohen and Wills (1985) that structural support is related more to disease onset, whereas functional support is related to outcome.

Summary of the Literature

Smoking has been identified as perhaps the single-most modifiable behaviour associated with increased risk of and mortality from coronary heart disease (Ben-Shlomo et al., 1994; Epstein & Perkins, 1988; Lakier, 1992; Sherk et al.,

1985; Wigle et al., 1990). Despite public awareness campaigns designed to inform people of the health risks associated with smoking, a 1994 survey of Canadians (Health Canada, 1994) found that 31% of Canadians aged 15 and over smoked, while another 27% reported being ex-smokers. It is evident that these public awareness campaigns are not reaching the entire population.

What makes some people continue to smoke and others quit? A number of researchers have attempted to answer this question (Cohen, 1988; Gilbert & Wesler, 1989; Health Canada, 1994; Manning et al., 1989; Marshall, 1990; Richmond in "Comments on West's", 1994; West, 1993). Among Canadians surveyed (Health Canada, 1994), the most frequently reported reasons for smoking were: (i) to relax, (ii) family and/or friends smoke, (iii) to combat boredom, and (iv) to control weight. Rather than simply identifying reasons why individuals continue to smoke, Prochaska and DiClemente (1992) took this area of smoking research one step further and developed the Transtheoretical Model of change which is intended to identify both stages and processes of change. These researchers argue that individuals do not change from being a smoker to an ex-smoker instantly. In order for an individual to move from being a smoker to a non-smoker, the negative aspects of smoking must outweigh the positive. For a smoker to exit the change process, he/she must maintain a non-smoking lifestyle for at least five years.

In addition to the negative impact smoking has on health, research has also indicated that smoking is related to depression (Haire-Joshu et al, 1994; Hall et al., 1993; Manning et al., 1989; Parchman, 1991). This is of great concern since depression, or emotional distress, is one of the most common emotional reactions to having had an MI (Christman et al., 1988; Cronin, 1990; Doehrman, 1977; Hotz et al., 1991; Kaufman et al., 1985-86; Singer, 1987; Trelawney-Ross & Russell, 1987) and

because of the increased risk of morbidity/mortality following an MI as a result of depression (Frasure-Smith et al., 1992; Kaufman et al., 1985-86; Ladwig et al., 1991; Lespérance et al., 1996; Wiklund et al., 1988). Specifically, smokers are not only at an increased risk of developing CHD, but also at an elevated risk of becoming depressed and, subsequently, dying. Other factors that have been identified as being related to depression include somatic symptoms and functional status (Griego, 1993).

Adding to the complexity of the research surrounding CHD is the fact that researchers have identified potential buffering effects of denial (Dimsdale & Hackett, 1982; Esteve et al., 1992; Levine et al., 1987; Warrenburg et al., 1989) and social intimacy (Cohen & Wills, 1985; Ell & Haywood, 1984; Hotz et al., 1991; Schwarzer & Leppin, 1991; Waltz et al., 1988).

While the smoking literature is abundant with research attempting to identify characteristics that differentiate smokers from non-smokers in the general population, very little has been done with respect to looking at differences between these groups in a specific medical population. It may be that an illness such as coronary heart disease alters one's perception of their behaviour and has an impact on characteristics that have been found to distinguish smokers from non-smokers in non-medical samples.

Blumenthal and colleagues (1989) argued that the change in health status as a result of having a heart attack will affect psychological, social and behavioural functioning. These researchers stressed the importance of assessing at least five broad domains of psychological functioning: (i) personality and psychopathology (including anxiety and depression); (ii) neuropsychological functioning (including memory, concentration, and attention); (iii) health behaviour (including perceived health, self-efficacy, motivation to change lifestyle habits, pain behaviour, and health care utilization); (iv) stress,

coping, and TABP; and, (v) social and work adjustment (including social support, sexual functioning, marital satisfaction, and work stress).

Also, while depression has been identified as a common response to myocardial infarction, very little research has focused on identifying in-hospital factors that may be able to identify individuals who are at an elevated risk for depression after discharge. Although Lespérance and colleagues (1996) reported that clinical variables assessed in-hospital were not powerful enough to identify patients at risk for becoming depressed post-discharge, it should be noted that only clinical variables that assessed depressive symptomatology were used by these researchers. It may be that other factors that are related to depression (e.g. smoking status, functional status, social intimacy and denial) can be used to identify at-risk individuals.

Purpose of the Present Study and Statement of Hypotheses

Part A

Part A of this study was designed to identify characteristics that distinguish among smokers, ex-smokers, and non-smokers in a sample of patients who have been hospitalized with a diagnosis of initial MI. Recognizing the importance of assessing a variety of factors (Blumenthal et al., 1989), three domains of psychosocial functioning were considered: (i) perceived and objective indices of health behaviour (body mass index, perceived health status, vulnerability to reinfarction, functional status, number of previously identified CHD risk factors); (ii) personality and psychopathology (depressive symptomatology, defensiveness); and, (iii) social adjustment (social intimacy). In addition to these three domains, differences among the three groups with respect to sociodemographic variables (gender, age, education, marital status) were also studied. Based on findings from past research of smokers, ex-smokers, and

non-smokers, the following hypotheses were made with respect to health behaviour, personality and psychopathology, and social adjustment.

Sociodemographics

While analyses were performed on gender, age, education, and marital status, it was expected that no significant differences would be observed among the groups with respect to these variables (DiClemente et al., 1991; Griego, 1993; Manning et al., 1989).

Health Behaviour

With respect to perceived and objective indices of health behaviour, it was hypothesize that:

- (i) body mass index would be lower among smokers compared to ex-smokers and non-smokers, since one of the most frequently reported reasons for continuing to smoke is to control weight (Health Canada, 1994);
- (ii) perceived health status would be lower among smokers than ex-smokers and non-smokers (Halpern & Warner, 1994; Manning et al., 1989); and,
- (iii) vulnerability to reinfarction (used as a measure of denial of impact of the coronary event) would be higher among smokers compared to ex-smokers and non-smokers -- the rationale underlying this hypothesis is that research has found depression to be higher among smokers than ex-smokers and non-smokers (Haire-Joshu et al., 1994; Hall et al., 1993; Manning et al.,

1989; Trelawney-Ross & Russell, 1987; Wiklund et al., 1984), and higher denial of impact leads to better emotional outcome over the initial phase of recovery (Havik & Maeland, 1988); therefore, if smokers are more depressed, they should not be experiencing high denial, thereby feeling more vulnerable to reinfarction.

While analyses were also performed on (i) the number of previously identified CHD risk factors (i.e. family history, personal history of cardiac symptoms, and personal history of cardiac surgery) and (ii) functional status, no significant differences were expected to be found among the groups. Specifically, all patients who participated in the study were initial MI patients, and should have had similar cardiac histories. Also, all MI patients were discharged from the hospital at a level 5 of activity (i.e. the patient could climb a flight of stairs, take care of personal hygiene, and dress themselves) and should have been functioning at a similar level of activity.

Personality and Psychopathology

With respect to personality and psychopathology, it was hypothesized that:

- (iv) smokers would be more defensive than ex-smokers and non-smokers (DiClemente et al., 1991);
- (v) depressive symptomatology would be higher among smokers than ex-smokers and non-smokers (Haire-Joshu et al., 1994; Hall et al., 1993; Manning et al., 1989); no significant differences were expected across time (Trelawney-Ross & Russell, 1987; Wiklund et al., 1984).

Social Intimacy

To be consistent with previous research that has found an inverse relationship between social intimacy and depression (Cohen & Wills, 1985; Ell & Haywood, 1984; Hotz et al., 1991; Waltz et al., 1988) and higher levels of depression among smokers (Haire-Joshu et al., 1994; Hall et al., 1993; Manning et al., 1989), it was hypothesized that:

- (vi) social intimacy would be lower among smokers compared to ex-smokers and non-smokers.

Part B

Part B of this study was exploratory in nature. It was intended to identify in-hospital predictors of depressive symptomatology following an AMI two months post-discharge. Although Lespérance and colleagues (1996) found clinical variables as assessed in-hospital not to be good predictors of post-discharge depression, these researchers focused only on depression-related variables (i.e. history of depression, number of DSM-III-R symptom clusters, and BDI scores) as predictors. Based on previous research, it is hypothesized that other factors may contribute to the experience of depressive symptoms post-MI. Specifically, researchers have found relationships between depression and: (i) smoking status (Haire-Joshu et al., 1994; Hall et al., 1993; Manning et al., 1989), (ii) functional status (Griego, 1993), (iii) social intimacy (Cohen & Wills, 1985; Ell & Haywood, 1984; Hotz et al., 1991; Schwarzer & Leppin, 1991), and (iv) denial/vulnerability to reinfarction (Esteve et al., 1992; Havik & Maeland, 1988; Levine et al., 1987; Warrenburg et al., 1989). Based on findings from this research, the following variables as assessed in-hospital (Time 1)

were considered: (i) smoking status, (ii) functional status, (iii) social intimacy, and (iv) vulnerability to reinfarction.

Other variables considered for inclusion in the analysis were: (i) defensiveness, (ii) perceived health status, (iii) confidence in making lifestyle more heart healthy, and (iv) feeling at risk of slipping into lifestyle habits that increase risk of heart disease. Defensiveness was included as a safeguard against defensive responding on the psychometric instruments. It was anticipated that perceived health status may be related to depressive symptomatology since the experience of physical symptoms has been found to be related to depression (Griego, 1993; Trelawney-Ross & Russell, 1987) and that the presence of physical symptoms may be an indicator of perceived health (Cronin, 1990). Confidence in making one's lifestyle more heart healthy and feeling at risk of slipping into lifestyle habits that increase the risk of developing heart disease tap into self-efficacy issues described in the Transtheoretical Model of Change (Prochaska, 1989; Prochaska & DiClemente, 1984; Velicer, DiClemente, Rossi & Prochaska, 1990).

While the nature of this research is exploratory, it was expected that social intimacy (Cohen & Wills, 1985; Ell & Haywood, 1984; Hotz et al., 1991; Schwarzer & Leppin, 1991; Waltz et al., 1988) and smoking status (Haire-Joshu et al., 1994; Hall et al., 1993; Manning et al., 1989; Parchman, 1991) would be significant predictors of the presence of post-discharge depressive symptoms. The remaining variables (functional status, vulnerability to reinfarction, defensiveness, perceived health status, confidence in making lifestyle more heart healthy, and feeling at risk of slipping into lifestyle habits that increase risk of heart disease) were included in the analysis as a result of previous research that has identified associations between these variables and depression, social intimacy, and/or smoking status.

Method

The methodology for participant selection and administration of the questionnaire package was the same for Parts A and B of the study. Therefore, the following description of the methods applies to the entire study.

Participants

Patients between the ages of 35 and 75, both male and female, were selected on the basis of admission to the Ottawa General Hospital (OGH) with a diagnosis of initial MI (established from medical charts and confirmed by the attending physician). Therefore, patients with a previous history of psychiatric disorder or depression were not approached. Patients were also required to have adequate knowledge of the English language in order to be able to complete the questionnaire package.

Patients were informed of the purpose of the study and what would be involved. The patient was asked if he/she would be willing to read the package and, if so, a package was left with him/her which included the patient information sheet and informed consent form. Verbal instructions to the patient for the in-hospital visit, the patient information sheet, and the informed consent form are reproduced in Appendices A, B, and C, respectively.

Through consultation with the medical team at cardiology rounds and a brief review of medical charts, an attempt was made to screen patients for psychiatric disorders in order to reduce potential confounds to the findings of the study. Three patients, two men and one woman, were excluded from the study due to psychiatric disorders.

Seventy-one patients met the inclusion criteria for the study. Of these, 30 (21 men -- 3 smokers, 4 non-smokers, and 14 of unknown smoking status; 9 women -- 3

smokers, 1 non-smoker, and 5 of unknown smoking status) refused to participate. Of the remaining 41 patients who agreed to participate in the study, one, an ex-smoker, was found to be both a univariate and a multivariate outlier (greater than 4 *SD*'s from the mean) and was eliminated from the study, leaving a total sample size of 40. Based on self-reported smoking status at the time of admission to the OGH, patients were identified as: (i) smokers (i.e. precontemplation, contemplation, preparation, and extended preparation -- individual reported not smoking upon admission to the hospital as a result of the no smoking policy -- phases of smoking cessation), (ii) ex-smokers (i.e. maintenance phase of smoking cessation and long term quitters), and (iii) non-smokers (i.e. never-smokers or those who reported experimenting once or twice in high school). Table 1 shows the demographic characteristics for each of the three groups.

Table 1

Demographic and Health Characteristics of Smoking Groups

	Smokers <i>n</i> (%)	Ex-smokers <i>n</i> (%)	Non-smokers <i>n</i> (%)
Gender:			
Male	10 (76.9)	15 (100.0)	12 (100.0)
Female	3 (23.1)	0 (0.0)	0 (0.0)
Educational Level:			
Less than high school	4 (30.8)	2 (13.3)	0 (0.0)
Completed high school	5 (38.5)	7 (46.7)	5 (41.7)
Some post-high school	1 (7.7)	1 (6.7)	1 (8.3)
Community College diploma	0 (0.0)	2 (13.3)	4 (33.3)
University degree	3 (23.1)	3 (20.0)	2 (16.7)
Marital Status:			
Single/never married	1 (7.7)	0 (0.0)	1 (8.3)
Married/common-law	12 (92.3)	15 (100.0)	11 (91.7)
Previous History of CHD:			
Family History of CHD	8 (61.5)	10 (66.7)	8 (66.7)
Previous Diagnosis of cardiac symptoms	4 (30.8)	2 (13.3)	4 (33.3)
Previous Surgery for cardiac symptoms	0 (0.0)	0 (0.0)	0 (0.0)
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Age	56.23 (8.69)	53.73 (9.53)	54.42(10.07)
Body Mass Index	26.82 (2.54)	29.20 (4.38)	28.62 (3.84)
Number of Previous CHD Risk Factors	1.00 (0.71)	0.80 (0.56)	1.17 (0.58)

Note that in the case of previous history of CHD, the categories are not mutually exclusive. Within the smoking group, three participants reported having no previous history of CHD risk factors, while two reported having both a family history and a previous diagnosis of cardiac symptoms. Among ex-smokers, four participants reported having no previous history of CHD risk factors, and one reported having both a family history and a previous diagnosis of cardiac symptoms. Among non-smokers, two participants reported having no previous history of CHD risk factors, while two others reported having both a family history and a previous diagnosis of cardiac symptoms.

The majority of participants completed questionnaire packages at both Time 1 and Time 2. Three smokers, four ex-smokers, and two non-smokers did not complete the Time 2 package.

Apparatus

In conjunction with the Health Psychology Division of the Department of Psychology at the OGH, a questionnaire package for cardiac patients was developed to assess health status, smoking behaviour, coping strategies, psychological distress, social intimacy, and defensiveness. Only those questionnaires relevant to the present study will be outlined below.

Sociodemographic Questionnaire. Attached as Appendix D is the questionnaire that was developed to obtain information regarding age, gender, height and weight (BMI), education level attained, marital status, living arrangements, and both family and previous personal history of CHD. Responses were used to describe characteristics of the smoking groups as shown in Table 1 of the subjects section. Age, gender, BMI, education level attained, marital status, and number of previously identified CHD risk

factors were used as dependent measures in Part A to determine if there were differences among the smoking groups with respect to these variables. Patients were only asked to complete this questionnaire at Time 1.

Health Activity Inventory. This instrument (Appendix E; J. Prochaska, personal communication, September 27, 1993) consists of a series of questions concerning intentions to alter health-related behaviours such as smoking, exercise, diet, and stress. The questions are worded such that a stage of change corresponding to the Transtheoretical Model of Change can be ascribed to each respondent (i.e. precontemplator, contemplator, prepared for action, action, and maintenance). Time 1 responses to the question regarding readiness to change smoking behaviour (i.e. question 7) were used to group participants in Part A and to identify smoking status in Part B.

Smokers (Group 1) consisted of individuals that gave one of the following responses: (i) "No, and I do not intend to in the next six months" (precontemplation), (ii) "No, but I intend to in the next six months" (contemplation), (iii) "No, but I intend to in the next 30 days" (preparation), or (iv) "Yes, I have been but for less than six months" (extended preparation). While this study was not designed to examine changes in smoking status over time, a breakdown of the number of respondents in each of the stages and their movement from Time 1 to Time 2 is shown in Appendix F.

Ex-smokers (Group 2) consisted of those individuals that responded: (i) "Yes, I have been for more than six months" (maintenance), or (ii) "Yes, I have been for more than five years" (long-term maintenance and those that have exited the process of smoking cessation). Whereas the Transtheoretical Model of Change would classify individuals who had quit smoking more than five years ago as non-smokers, this study identified them as ex-smokers, allowing for differences among never-smokers and

long-term ex-smokers to be observed. Note that all participants identified as ex-smokers in this study reported having quit smoking for at least five years prior to the heart attack.

Non-smokers (Group 3) were those individuals that reported not having smoked cigarettes on a regular basis at any time in their life. This group included individuals that reported experimenting once or twice in high school.

Question 1 of the Health Activity Inventory was used to assess perceived health status at both Time 1 and Time 2. This measure was used in Part A as a repeated measures dependent variable. In Part B, perceived health status at Time 1 was identified as a potential predictor of depressive symptomatology at Time 2.

Vulnerability to Reinfarction. A single item likert-type rating scale was used to measure vulnerability to reinfarction/denial of impact. Patients were asked, "How vulnerable do you feel about having another heart attack?". Responses were scored from 0 (not at all vulnerable) to 10 (very vulnerable). Therefore, the higher the rating, or the more vulnerable a patient feels to reinfarction, the lower the denial of impact.

Duke Activity Status Index (DASI). The Duke Activity Status Index (Appendix G; Hlatky, Boineau, Higginbotham, Lee, Mark, Califf, Cobb & Pryor, 1989) is a 12-item scale designed to measure functional capacity and quality of life. Each of the 12 items assesses one of the following aspects of physical functioning: personal care, ambulation, household tasks, sexual function, and recreational activities. Subjects obtain one score that is used as an estimate of physical functioning.

Although further studies are needed to assess the reliability of the DASI over time, validity for this instrument is demonstrated by a Spearman correlation coefficient of

.58 ($p < .0001$) between scores on the DASI and peak oxygen uptake (Hlatky, Boineau, Higginbotham, Lee, Mark, Califf, Cobb & Pryor, 1989).

While no change in functional status was expected from Time 1 to Time 2 since patients are discharged at a Level 5 of physical functioning, this variable was used as a repeated measures dependent variable in Part A to obtain an assessment of functional ability that was concurrent with psychological adjustment. In Part B, functional status at Time 1 was identified as a potential predictor of depressive symptomatology at Time 2.

Balanced Inventory of Desirable Responding (BIDR). The Balanced Inventory of Desirable Responding (Appendix H; Paulhus, 1991) is a 40-item instrument designed to measure the tendency to give socially desirable responses on a self-report questionnaire. The BIDR is composed of two separate subscales: (1) Self-Deceptive Enhancement (SDE) which is the tendency to give honest but inflated self-descriptions, and (2) Impression Management (IM), which is the tendency to give socially desirable self-descriptions in public settings. Each statement is rated from 1 (not at all) to 7 (very much) with respect to level of agreement.

Internal consistency of the BIDR is evidenced by coefficient alphas ranging from .83 to .85 for the total scale score, .70 to .82 for SDE, and .80 to .86 for IM (Paulhus, 1991). Test-retest reliability is shown by correlations of .69 for SDE and .65 for IM over a five-week period ($n=83$; Paulhus, 1991).

The SDE and IM have been found to measure distinct aspects of social desirability, as evidenced by intercorrelations ranging from .19 to .32 (Paulhus, 1991). Construct validity is indicated by a correlation of .71 between the Marlowe-Crowne and total score on the BIDR (Paulhus, 1991). Convergent validity is evidenced by correlations between the IM and various lie scales (e.g., MMPI Lie scale, Eysenck's Lie scale), and between the

SDE and measures of defensiveness (e.g., Defense Mechanisms Inventory, $r=.34$; Paulhus, 1991) and perceived control (Paulhus & Reid, 1991). The SDE has also been found to be negatively correlated with anxiety and/or distress (Paulhus & Reid, 1991).

Two measures of defensiveness (SDE and IM) were used to assess group differences in Part A. To the extent that these measures were correlated with other dependent variables, defensiveness was used as a covariate in Parts A and B.

Brief Symptom Inventory (BSI). The Brief Symptom Inventory (Appendix I; Derogatis, 1992) is a 53-item self-report symptom inventory designed to reflect psychological symptom patterns of psychiatric and medical patients, and non-patient populations. For each item, respondents are asked to rate their level of distress on a scale of 0 (not at all) to 4 (extremely). The BSI takes approximately 10 minutes to complete.

Scores for nine primary symptom dimensions can be computed: (i) somatization, (ii) obsessive-compulsive, (iii) interpersonal sensitivity, (iv) depression, (v) anxiety, (vi) hostility, (vii) phobic anxiety, (viii) paranoid ideation, and (ix) psychoticism. Three global indices of distress can also be calculated: (i) global severity index, (ii) positive symptom total, and (iii) positive symptom distress index.

Although originally intended for use with psychiatric outpatients, the BSI has been used in a variety of research settings, including cancer, chronic pain, aids, hypertension (Derogatis, 1992), and coronary heart disease (Rose, 1989).

Internal consistency estimates for each of the nine subscales, using Cronbach's coefficient alpha, range from 0.71 for Psychoticism to 0.85 for Depression in a sample of 719 psychiatric outpatients (Derogatis, 1992). Croog and colleagues (1986)

reported similar statistics in a sample of 626 men with mild to moderate hypertension (i.e. 0.78 to 0.83).

Test-retest reliability estimates ranged from 0.68 for Somatization to 0.91 for Phobic Anxiety in a sample of 60 non-patients tested over a two-week interval. The Depression subscale had a test-retest reliability of 0.84. The Global Severity Index (GSI) also had high test-retest reliability (0.90) over the same period (Derogatis, 1992).

High correlations between the nine dimensions of the BSI and the corresponding subscales of the MMPI provided evidence for convergent validity, while a replication of the factor structure of the BSI using principle components analysis on a separate sample from which the instrument was originally designed provided evidence for construct validity. The Depression subscale correlates significantly with special scales of mood disturbance developed by Wiggins (1966) and Tryon (1966).

Scores on the depression scale of the BSI at Time 1 and Time 2 were used to assess group differences in Part A. In Part B, depression scores at Time 2 were used as the dependent measure in the multiple regression analysis.

Miller Social Intimacy Scale (MSIS). The Miller Social Intimacy Scale (Appendix J; Miller & Lefcourt, 1982) is a 17-item measure of the level of intimacy currently experienced by an individual. Six of the 17 items ask respondents to rate the frequency of interaction from 0 (very rarely) to 10 (almost always); the remaining 11 items are intensity ratings, ranging from 0 (not much) to 10 (a great deal). Responses for all 17 items are tallied to yield a single score of the maximum level of intimacy experienced at present.

Internal consistency of this instrument is evidenced by Cronbach alpha coefficients ranging from .86 to .91 in a sample of unmarried university students. Test-retest reliability estimates of $r=.96$ over a two-month period and $r=.84$ over a one-month period indicates that there is some stability in the maximum level of intimacy experienced over time (Miller & Lefcourt, 1982).

A high positive correlation between scores on the Interpersonal Relationship Scale ($r=.71$) and a high negative correlation with scores on the UCLA Loneliness Scale ($r=-.65$) provide evidence for convergent validity (Miller & Lefcourt, 1982).

Construct validity was shown by higher mean MSIS scores for describing relationships between close friends than those of casual friends ($t = 9.18$), and higher mean MSIS scores for married students compared to unmarried ones ($t = 8.17$) (Miller & Lefcourt, 1982).

In Part A, the maximum level of intimacy scores at Time 1 and Time 2 were used as dependent measures in a repeated measures ANOVA to assess group differences. In Part B, Time 1 MSIS scores were used as a potential predictor of depressive symptomatology at Time 2.

Confidence and Self-Efficacy. As part of the exploratory research in Part B, two additional questions that correspond with the constructs of confidence and self-efficacy as defined in the Transtheoretical Model of Change were asked of participants. The question "How confident are you about making your lifestyle more heart healthy?" was rated from 0 (not at all) to 4 (extremely confident), while the question "How much do you feel at risk of slipping into lifestyle habits that increase your risk for heart disease?" was rated from 0 (extremely tempted) to 4 (not at all tempted). In Part B,

these two variables, as assessed at Time 1, were used as potential predictors of depressive symptomatology at Time 2.

Procedure

Test Administration. Patients between the ages of 35 and 75, both male and female, were selected on the basis of admission to the Ottawa General Hospital for an initial AMI. This criterion was established from medical charts in which the diagnosis of initial AMI was confirmed by the attending physician. Once approved by the physician, patients were approached while in hospital, informed of the purpose of the research project and asked if they would be willing to complete the assessment package. If agreeable, patients were left a questionnaire package and the name and number of the research assistant if any questions should arise. Home telephone numbers of the patients were recorded, and patients were told that they would be contacted in about a week's time to answer any questions they might have regarding items in the questionnaire package. If any questions should arise in the meantime, patients were encouraged to contact the research assistant for assistance. Patients were provided with a self-addressed, stamped envelope should they decide to participate in the study and asked to read and sign the consent form that was included with the package (Appendices A, B, and C contain verbal instructions to the patient during hospitalization, the patient information sheet, and the informed consent form, respectively).

During the initial telephone contact, the patient was briefly reminded of the visit in hospital and asked if he/she had a chance to review the questionnaire package. The patient was asked if he/she was still willing to participate in the research project. If still agreeable, any questions regarding questionnaire items were answered and the patient was asked to return the questionnaire package as soon as possible. At this time,

the patient was reminded that they would be contacted in approximately six weeks to remind them of the final assessment package, and to obtain the patient's mailing address. If the initial assessment package had not been received within a week, the patient was contacted again to remind him/her to complete and return the package.

At the six-week telephone follow-up, patients were again reminded of the study and asked for their mailing address so the final questionnaire package could be mailed to them. A letter reminding the patient about the study was enclosed with the questionnaire package; it also contained information regarding the approximate date on which the package should be completed and a date when the research assistant would contact them if they had any questions (see Appendix K). Again, patients were encouraged to call the research assistant should any questions arise in the meantime.

After the questionnaire package was mailed, patients were contacted on the date specified in their "instruction" letter. Patients were reminded to complete and return the package as soon as possible, and asked if there were any questions or concerns they had regarding the research project. In cases where the questionnaire package had already been returned, patients were thanked once again for their participation in the study. Patients were debriefed (see Appendix L) and told that once results were available, a brief summary of the highlights would be made available to them if they were interested; names and addresses of those interested were recorded.

Data Analysis. Prior to analyzing the data for this study, missing data for all variables, with the exception of social intimacy, was assigned the mean value for the smoking group to which the participant belonged. Social intimacy was treated differently because the participant who did not complete this questionnaire at Time 1 reported having no intimate or close relationships. A second participant reported that he

had separated from his wife since the Time 1 assessment. It was decided, therefore, to analyze data only for those individuals who provided data at both Time 1 and Time 2 for this particular variable.

Once group means had been assigned to missing values, both univariate and multivariate outliers were sought among the continuous variables (age, BMI, number of previously identified CHD risk factors, defensiveness, perceived health status, vulnerability to reinfarction, functional status, social intimacy, and depressive symptomatology) for each group and for the entire sample. For the two continuous variables being used only in Part B (confidence in making lifestyle more heart healthy, and perceived risk of slipping into unhealthy behaviours that increase the risk of heart disease), univariate and multivariate outliers were sought among the entire sample at once. One univariate and multivariate outlier was found (>4 SD's from the mean), and was subsequently deleted from the analyses.

For the three categorical variables (gender, education, and marital status), outliers were sought according to the split between categories. Gender and marital status both showed greater than 90-10 splits, therefore only general statements regarding these two variables were made in the results section.

Assumptions for all statistical analyses were tested (e.g. normality, linearity, homogeneity of variance-covariance). No violations of these assumptions were observed.

Responses for various questions on the sociodemographic questionnaire were used to describe individuals in each of the research groups. Descriptive statistics (frequency, percent, mean, and standard deviation) were used for this purpose and results are presented in Table 1 of the Participants section.

Results

Part A

ANOVA's, ANCOVA's, MANOVA's, and chi-square analyses were performed on targeted sociodemographic and psychosocial variables in order to identify characteristics that distinguished among smokers, ex-smokers, and non-smokers. An alpha level of .05 was used for all statistical tests.

Sociodemographic Variables

Gender. Due to the disproportionate number of males (n=37) to females (n=3), a chi-square analysis could not be performed to determine if there were significant differences in gender among the groups. Nevertheless, it is interesting to note that all three female participants were identified as smokers.

Marital Status. The majority of respondents in all groups reported being married or living common-law. No respondents reported being separated, divorced, or widowed. Only two individuals, one smoker and one non-smoker, reported being single or never married. Due to the disproportionate number of respondents who had a spouse (n=38) compared to those who did not (n=2), a chi-square analysis could not be performed to determine if there were differences among the groups.

Age. Results of a one-way ANOVA performed on AGE are shown in Table 2. No significant differences among smokers ($M = 56.23$, $SD = 8.69$; range of 43 to 75 years), ex-smokers ($M = 53.73$, $SD = 9.53$; range of 39 to 67 years), and non-smokers ($M = 54.42$, $SD = 10.07$; range of 40 to 70 years) were observed.

Table 2
One-Way ANOVA for Age

Source	df	<i>F</i>
		Age
Smoking Status	2	0.25
error	37	(88.98)

Note. Values enclosed in parentheses represent mean square errors.

Education. Responses regarding education level attained were recoded to identify two levels of education: (i) less than, or completed, high school; and, (ii) at least some post-secondary education. No significant differences were observed between smoking status and education level attained, $\chi^2 (2) = 2.00$, n.s.

Health Behaviour

Body Mass Index (BMI) and History of CHD. To determine if there were differences among the groups with respect to health risk, a MANOVA was performed on body mass index and number of previously identified CHD risk factors (family history, previous diagnosis of cardiac symptoms, and/or previous surgery for cardiac symptoms). Results of the analysis indicated no significant differences among the groups -- multivariate $F(4, 72) = 1.31$, n.s. Means and standard deviations for each variable are displayed by group in Table 3. It is interesting to note that the mean BMI for subjects in all groups was within the range of elevated risk for CHD (i.e. >25), according to guidelines of the Heart and Stroke Foundation of Canada (1993).

Table 3

Means and Standard Deviations for Body Mass Index and History of CHD

	Body Mass Index <i>M (SD)</i>	History of CHD <i>M (SD)</i>
Smokers	26.82 (2.54)	1.00 (0.71)
Ex-Smokers	29.20 (4.38)	0.80 (0.56)
Non-Smokers	28.62 (3.84)	1.17 (0.58)

Perceived Health Status, Vulnerability to Reinfarction and Self-Reported

Functional Status. Prior to assessing group differences with respect to perceived adjustment, a correlation matrix among two measures of defensive responding (SDE and IM) and these three variables was produced to explore potential response bias. Table 4 shows the obtained pearson-product moment correlations. Given that neither SDE nor IM were significantly correlated with perceived health status, vulnerability to reinfarction, and self-reported functional status there was no need to control for response bias in this analysis.

Table 4

Correlations Among Measures of Defensiveness and Perceived Health Status,
Vulnerability to Reinfarction, and Self-Reported Functional Status

	<i>r</i>	
	SDE	IM
IM	.46* (n=40)	- -
PHS (Time 1)	.14 (n=40)	.14 (n=40)
PHS (Time 2)	.22 (n=40)	.18 (n=40)
VULN (Time 1)	.08 (n=40)	-.05 (n=40)
VULN (Time 2)	-.05 (n=40)	-.22 (n=40)
DASI (Time 1)	.11 (n=40)	.26 (n=40)
DASI (Time 2)	.14 (n=40)	-.06 (n=40)

Note: * indicates $p < .05$.

To determine if the smoking groups differed with respect to these three measures of perceived health, a one-way repeated measures MANOVA was performed. No smoking x time interaction was found -- $F(6,70) = 0.85$, n.s. Results indicated no main effects for: (i) smoking status -- $F(6,70) = 1.11$, n.s.; or (ii) time -- $F(3,35) = 1.30$, n.s. (Univariate results were consistent with the multivariate findings). Means and standard deviations for each variable are displayed by group in Table 5.

Table 5

Means and Standard Deviations for Perceived Health Status, Vulnerability to Reinfarction and Self-Reported Functional Status

	Time 1	Time 2	Total
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Perceived Health Status			
Smokers	3.08 (0.86)	2.77 (0.44)	2.92 (0.69)
Ex-Smokers	3.60 (0.91)	3.13 (0.74)	3.37 (0.85)
Non-Smokers	3.08 (1.24)	3.08 (1.00)	3.08 (1.10)
Full Sample (i.e. collapsed across smoking group)	3.28 (1.01)	3.00 (0.75)	

Table 5 (continued)

Means and Standard Deviations for Perceived Health Status, Vulnerability to Reinfarction and Functional Status

	Time 1	Time 2	Total
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Vulnerability to Reinfarction			
Smokers	4.85 (2.94)	6.00 (1.83)	5.42 (2.47)
Ex-Smokers	4.80 (3.21)	5.00 (2.73)	4.90 (2.93)
Non-Smokers	5.75 (2.38)	5.83 (2.41)	5.79 (2.34)
Full Sample (i.e. collapsed across smoking group)	5.10 (2.85)	5.58 (2.35)	
Functional Status			
Smokers	27.77 (20.48)	22.46 (13.76)	25.11 (17.30)
Ex-Smokers	27.23 (19.25)	35.27 (16.94)	31.25 (18.28)
Non-Smokers	35.56 (20.57)	38.40 (17.13)	36.98 (18.56)
Full Sample (i.e. collapsed across smoking group)	29.91 (19.89)	32.05 (17.06)	

Personality and Psychopathology

Defensiveness. A pearson-product moment correlation of .46, $p < .05$, between the SDE and IM scales of the BIDR (see Table 4) indicated that these two measures of social desirability produced somewhat redundant information. It was decided that only one of these measures should be used in the analysis of defensive responding. Further exploration into the patterns of correlations between these two measures of social desirability and two additional outcome variables (depressive symptomatology and social intimacy; see Tables 7 and 9, respectively) led to the decision to use the SDE scale as a sole measure of social desirability in this study.

Results of the univariate ANOVA performed on SDE are displayed in Table 6. Differences among smokers ($M = 87.15$, $SD = 11.34$; range of 75 to 118), ex-smokers ($M = 88.00$, $SD = 11.64$; range of 68 to 108), and non-smokers ($M = 97.83$, $SD = 13.81$; range of 70 to 113) approached significance at $p = .06$. Post-hoc comparisons using the Behrens-Fisher approach indicated that there is a trend in the opposite direction to what was predicted. Specifically, in this sample of cardiac patients non-smokers tended to score higher on defensiveness than did smokers and ex-smokers (see Appendix M). The fact that this is not consistent with findings from non-medical populations, leads one to speculate that the impact of an illness, in this case a heart attack, may trigger defensiveness in individuals who otherwise would not be defensive. On the other hand, because the BIDR assesses a stable trait, it is possible that non-smokers are more defensive than individuals who have ever smoked.

Table 6

One-Way ANOVA for Self-Deceptive Enhancement

Source	df	<i>F</i>
		SDE
Smoking Status	2	2.95
error	37	(149.66)

Note. Values enclosed in parentheses represent mean square errors.

Depressive Symptomatology. Table 7 shows the correlations among the two measures of social desirability (SDE and IM) and depressive symptomatology at Time 1 and Time 2. Whereas impression management (IM) was not found to be significantly correlated with depressive symptomatology, self-deceptive enhancement (SDE) was found to be negatively correlated with in-hospital depressive symptomatology. This pattern of zero-order correlations indicated a potential need to statistically control for social desirability in this analysis. A test for the significance of the covariate supported this decision -- $F(1,36) = 15.41, p < .001$.

Table 7

Correlations Among Measures of Defensiveness and Depressive Symptomatology

	<i>r</i>	
	SDE	IM
IM	.46* (n=40)	- -
Depressive Symptomatology (Time 1)	-.44* (n=40)	-.14 (n=40)
Depressive Symptomatology (Time 2)	-.28 (n=40)	-.15 (n=40)

Note. * indicates $p < .05$.

A repeated measures ANCOVA was performed on depressive symptomatology using SDE as a covariate to determine if groups differed. Results are displayed in Table 8. While no interaction was found, a main effect for smoking status was observed. Adjusted means for depressive symptomatology were calculated to be 0.32, 0.48, and 0.85 for smokers, ex-smokers, and non-smokers, respectively. Post hoc comparisons using the Behrens-Fisher procedure revealed that, after adjustment for defensive responding, non-smokers had significantly higher scores on depressive symptomatology than smokers, $p < .05$. Differences in scores of depressive symptomatology between non-smokers and ex-smokers approached significance, while smokers and ex-smokers did not differ significantly (see Appendix M).

Table 8

One-Way Repeated Measures ANCOVA for Depressive Symptomatology,
Controlling for Social Desirability

Source	df	F
		Depressive Symptomatology
Between Groups:	39	
Smoking Status	2	3.84*
error	36	(0.21)
covariate	1	
Within Groups:	40	
Time	1	2.90
Smoking Status x Time	2	0.30
error	37	(0.11)

Note. Values enclosed in parentheses represent mean square errors.

* indicates $p < .05$

Social Intimacy. Table 9 shows the correlations among the two measures of social desirability (SDE and IM) and social intimacy at Time 1 and Time 2. Whereas impression management (IM) was not found to be significantly correlated with social intimacy, self-deceptive enhancement (SDE) was found to be positively correlated with social intimacy in-hospital. This pattern of zero-order correlations indicated a potential need to statistically control for social desirability in this analysis. A test for the significance of the covariate, however, led to the decision to perform a repeated measures ANOVA -- $F(1,25) = 2.80, p = 0.11$.

Table 9

Correlations Among Measures of Defensiveness and Social Intimacy

	<i>r</i>	
	SDE	IM
IM	.46* (n=40)	- -
MSIS (Time 1)	.36* (n=39)	.11 (n=39)
MSIS (Time 2)	.25 (n=30)	-.15 (n=30)

Note. * indicates $p < .05$.

A repeated measures ANOVA was performed on social intimacy to determine if groups differed. Results are displayed in Table 10. No interaction or main effects were found. Means and standard deviations for each group are shown in Table 11.

Table 10

Repeated Measures ANOVA for Social Intimacy

Source	df	<i>F</i>
		MSIS
Between Groups:	28	
Smoking Status	2	0.13
error	26	(2,179.83)
Within Groups:	29	
Time	1	2.95
Smoking Status x Time	2	0.47
error	26	(127.35)

Note. Values enclosed in parentheses represent mean square errors.

Table 11

Means and Standard Deviations for Social Intimacy

	Time 1	Time 2	Total
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Smokers	134.25 (30.48)	131.50 (33.59)	132.88 (32.80)
Ex-Smokers	132.08 (24.61)	128.67 (29.99)	130.38 (26.89)
Non-Smokers	129.56 (35.35)	120.22 (46.54)	124.89 (40.38)
Full Sample (i.e. collapsed across smoking group)	131.90 (29.85)	126.83 (35.72)	

Part B

A standard multiple regression analysis was performed to identify in-hospital predictors of post-MI depressive symptomatology two months following discharge. Table 12 shows the results of a correlational analysis performed on the targeted psychosocial predictors and depressive symptomatology as assessed at Time 2.

Table 12

Correlations Among Targeted Predictor Variables and Time 2 Depressive Symptomatology

	<i>r</i>							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Smoking Status (1)	1.00							
SDE (2)	-.33*	1.00						
DASI (3)	-.15	.11	1.00					
VULN (4)	-.12	.08	-.21	1.00				
MSIS (5)	-.05	-.36*	.00	-.24	1.00			
PHS (6)	-.01	.13	.11	-.37*	.44*	1.00		
CONF (7)	-.28	.29	.21	-.13	.38*	.23	1.00	
PRISK (8)	.15	.30	-.10	.00	.60*	.28	.23	1.00
Depressive Symptomatology (9)	-.14	-.28	-.20	.12	-.41*	-.38*	-.35*	-.43*

Note. All correlations are based on the full sample (N=40) with the exception of MSIS (n=39).

* indicates $p < .05$.

Based on this pattern of zero-order correlations, three variables (perceived health status -- PHS, confidence in making lifestyle more heart healthy -- CONF, and feeling at risk of slipping into lifestyle behaviours that increase risk of heart disease -- PRISK) were included as predictors of depressive symptomatology in a standard multiple regression analysis. Standardized (β) and unstandardized (B) regression coefficients, and the y-intercept are displayed in Table 13.

Table 13

Regression Weights of In-Hospital Predictors of Post-MI Depressive Symptomatology

Variable	B	SE B	β
Perceived Health Status	-.08	.05	-.24
Confidence in Making Lifestyle More Heart Healthy	-.08	.06	-.22
Perceived Risk of Slipping Into Lifestyle Behaviours that Increase the Risk of CHD	-.12	.05	-.31*
Constant	1.15		

Note. * indicates $p < .05$.

Together these three variables (PHS, CONF, and PRISK) account for 31% (25% after adjustment) of the variance in depressive symptomatology two months post-discharge -- $F(3, 36) = 5.30, p < .005$. Perceived health status, confidence in making lifestyle more heart healthy, and perceived risk of slipping into lifestyle behaviours that increase the risk of CHD uniquely account for 6%, 5%, and 9% of the

variance in depressive symptomatology, respectively. Calculations showed that 11% percent of the variance in depressive symptomatology two months post-discharge is attributable to shared variance between these three factors. As shown in Table 13, only PRISK was found to contribute significantly to the prediction of post-discharge depressive symptomatology. Nevertheless, the remaining variables (PHS and CONF) do play an important part in the prediction equation since 11% of the variance in depressive symptomatology is shared among the three variables examined.

Discussion

Part A

In Part A, an effort was made to identify characteristics that distinguish among smokers, ex-smokers, and non-smokers in a sample of patients who had just experienced an initial MI. A number of sociodemographic variables (gender, age, education, marital status), perceived and objective indices of health behaviour (body mass index, previous history of CHD, perceived health status, vulnerability to reinfarction, and functional status,) and psychosocial variables (defensiveness, social intimacy, and depressive symptomatology) were studied. While the sample obtained for this study was small, some interesting findings emerged from the data. Further investigation of these issues with a larger sample is warranted.

Sociodemographic Variables

Based on previous findings from the smoking literature, no differences among the smoking groups with respect to gender (DiClemente et al., 1991; Griego, 1993), age, education, and marital status (DiClemente et al., 1991; Griego, 1993; Manning et al., 1989) were expected. While the results from this study upheld these expectations some interesting observations were made that warrant a brief discussion.

Gender. The three women who participated in this study were all identified as smokers. A larger sample is required to determine if there are gender differences similar to those reported in Health Canada survey (1995) and in the research of Manning and colleagues (1989), or if in fact there are no gender differences with

respect to smoking status as reported by Prochaska and DiClemente (1992) and Griego (1993).

Marital Status. The social support literature clearly indicates that functional support (i.e. intimacy) is more closely linked to psychosocial adjustment following acute myocardial infarction (Cohen & Wills, 1985; Ell & Haywood, 1984; Hotz et al., 191; Schwarzer & Leppin, 1991; Waltz et al., 1988) than is structural support (i.e. marital status; Ell & Haywood, 1984; Schwarzer & Leppin, 1991). To the extent that psychosocial adjustment is the focus of the research, measures of social intimacy should be considered before marital status.

Age. Further study of the age issue with initial MI patients is warranted to determine if MI patients at various stages of the smoking process differ with respect to age. No significant differences have been observed by DiClemente and colleagues (1991) and Manning and colleagues (1989); whereas the Health Canada survey (1995) reported a higher proportion of individuals in the 65-years-of-age-and-older group to be in the precontemplation stage. It may be that the threat of death imposed by a heart attack has a greater impact on the younger MI patient than on one that is older (for example, the younger MI patient may have young children at home and a family to support, whereas the older patient may have fewer obligations). Among initial MI patients, therefore, precontemplators may tend to be older and those prepared for action may be younger. This finding would be more consistent with the results from the Health Canada survey (1995).

Education. A larger sample is required to determine if there are education differences similar to those reported in the Health Canada survey (1995), or if in fact there are no gender differences with respect to smoking status as reported by DiClemente and colleagues (1992) and Manning and colleagues (1993).

Perceived and Objective Indices of Health Behaviour

Body Mass Index. Given that BMI was uniformly high (>25) and that mean age was elevated (55 years), the composition of the sample did not provide adequate opportunity to test this hypothesis. In addition to these problems, small sample size and the fact that the majority of participants were male may have also played a role in this non-significant finding. Specifically, research has suggested that the relationship between smoking and weight control is primarily found among adolescent females (French, Perry, Leon & Fulkerson, 1994) and women (Perkins, 1993). If more women had participated in the study, differences may have been observed. Additional research with more subjects and more women is needed to explore this hypothesis further.

Number of Previously Identified CHD Risk Factors. The expectation that no difference among the groups would be observed with respect to number of previously identified CHD risk factors (i.e. family history, personal history of cardiac symptoms, and personal history of cardiac surgery) was upheld in this study. While the purpose in this study was to show that the groups did not differ with respect to unmodifiable CHD risk factors, further research may consider expanding the number of previously identified CHD risk factors to include modifiable behaviours such as alcohol use,

exercise, diet, and the TABP (or its components) to allow for a more complete assessment of this variable and to increase variability of the scale.

Perceived Health Status. The hypothesis that perceived health status among cardiac patients would be lower among smokers compared to ex-smokers and non-smokers was not supported in this study. One potential reason for this non-significant finding may be that in this study patients have had a heart attack, whereas in the other studies reviewed subjects were sampled from the general population. It seems realistic to assume that a threat, such as a heart attack, to one's life would have an impact on one's health perception. Further research is needed to address this issue.

Vulnerability to Reinfarction. The hypothesis that perceived vulnerability to reinfarction would be higher among smokers compared to ex-smokers and non-smokers was not supported in this study. One argument that may be made is that the item used to measure the construct of denial of impact may have been too simplistic in this study. Whereas, Havik and Maeland (1988) used a 72-item instrument that assessed three denial domains: (i) denial of illness -- repudiation of the illness and/or need for treatment; (ii) denial of impact -- repudiation of anxiety related to the illness and/or of apprehension due to recurrence of the symptoms; and (iii) suppression -- a conscious effort to avoid thinking about the illness. All items were measured on a five-point scale. Other studies reviewed for the effects of denial on emotional outcome used a similar instrument to that described by Havik and Maeland (Dimsdale & Hackett, 1982; Esteve et al., 1992; Levine et al., 1987; Warrenburg et al., 1989). Nevertheless, it is important to note that other research with coronary patients have successfully used a single item measure of denial/vulnerability to reinfarction to

identify adaptive and maladaptive coping responses to acute myocardial infarction (Nolan & Wielgosz, 1991) and to identify factors that will predict a patient's delay in seeking medical assistance when confronted with symptoms of AMI (Wielgosz, Nolan, Earp, Biro, and Wielgosz, 1988).

Perhaps future research should continue to use these likert-type rating scales, but include more than one aspect of denial when the goal is to predict emotional outcome. In addition to vulnerability to reinfarction, other areas of denial that might be explored include: (i) information avoidance (denial of impact), (ii) delay in seeking treatment (denial of illness), and (iii) coping strategies employed when confronted with cardiac symptoms (suppression).

Self-Reported Functional Status. The expectation that there would be no difference among the smoking groups with respect to functional status was upheld in the current study. It is of interest to note, however, that for both the ex-smokers and non-smokers, self-reported functional status increased slightly from Time 1 to Time 2, whereas the smokers self-reported functional status decreased over the same time period. While these differences may be due to random fluctuation, it is recommended that further research continue to explore this issue, especially since test-retest reliability data for the DASI are lacking.

Personality and Psychopathology

A limited assessment of personality and psychopathology was undertaken, using a single measure of each -- defensiveness and depressive symptomatology, respectively.

Defensiveness. The hypothesis that smokers would be more defensive than ex-smokers and non-smokers was not supported in this study, although differences among the groups with respect to defensive responding did approach statistical significance. Specifically, non-smokers had the highest SDE scores, indicating that in this particular sample of cardiac patients, non-smokers had a greater propensity towards defensiveness than did the ex-smokers and smokers. This finding is fascinating, given that previous research reported the reverse trend. The likelihood of results approaching statistical significance with such a small sample are quite low. Given a larger sample, therefore, it is expected that this trend would continue. If further research supports this finding, one must attempt to determine why this should be true in this particular population.

Two factors that may have had an impact on the current results and that should be considered in future studies of defensive responding are worthy of discussion. Both issues directly affect the comparability of the current results to those of Prochaska and DiClemente (1992). The first issue that must be considered is the way in which groups in both studies were divided. While both studies employed the Transtheoretical Model to classify individuals, the current study defined smokers as individuals in precontemplation, contemplation, and prepared for action stages, whereas Prochaska and DiClemente (1992) kept these groups of individuals separate for comparison. Given the classification of smokers in the current study, it may have been difficult to tease out differences among the groups with respect to defensive responding. Recall that Prochaska and DiClemente (1992) found defensive responding to be higher among individuals in precontemplation than those in contemplation or preparation. Also, the fact that none of the smokers in the current study reported being in preparation at the time of the initial assessment may also have had an influence on the results. On the other

hand, because the BIDR assesses a stable trait, it is possible that non-smokers are more defensive than individuals who have ever smoked. Further research is required to test this hypothesis, since the literature to date does not adequately address the issue of defensiveness among never-smokers.

The second issue that must be considered is the measure used to assess defensive responding in the two studies. Whereas Prochaska and DiClemente (1992) used the Marlowe-Crowne Social Desirability Scale, the current study used the self-deceptive enhancement scale of the BIDR. While both instruments are assumed to measure the same construct, as evidenced by a correlation of .71 between the total BIDR score and the Marlowe-Crowne, the fact is that the instruments are not identical and there is room for variation.

Holden and Fekken (1989) describe evidence that there are differences among measures of social desirability. These researchers examined characteristics of three widely used social desirability scales (Jackson's, Edward's, and Marlowe-Crowne social desirability scales) to determine if there was strong convergence among them. Results indicated that Jackson's and Edward's scales essentially measured the same construct (i.e. self-deception), whereas the Marlowe-Crowne scale was found to measure impression management. Paulhus (1991) found the SDE scale of the BIDR to measure the same construct as Jackson's and Edward's scales, whereas the IM scale is more closely associated with Eysenck's Lie Scale. Paulhus (1991) noted that the Marlowe-Crowne scale loads on both the SDE and IM scales of the BIDR, but that it is more closely related to IM than SDE.

By using the Marlowe-Crowne to assess social desirability, therefore, Prochaska and DiClemente (1992) were defining defensiveness/social desirability in terms of both impression management and self-deceptive enhancement -- perhaps more in terms of

impression management. The current study, however, defined it in terms of self-deception. Had the impression management scale or the total BDR score been used to assess social desirability in this study, the results may have been more similar to those of Prochaska and DiClemente (1992). To test this post-hoc hypothesis, additional analyses were performed using both the impression management scale and the total BDR scores as measures of social desirability/defensiveness (results are shown in Appendix N). Groups were found to differ with respect to both impression management ($F = 8.20, p < .005$) and total BDR scores ($F = 8.17, p < .005$). Post hoc comparisons using the Scheffé method, revealed that non-smokers had higher social desirable response sets compared to ex-smokers and smokers. Ex-smokers and smokers did not differ significantly from each other. These findings paralleled those reported above, using the SDE index.

Further research should continue to assess the construct of social desirability as it relates to smoking behaviour. Results from the current study underscore the importance of assessing more than one dimension of social desirability (i.e. self-deception and impression management). Studies conducted by Paulhus and Reid (1991) identify the potential need to further divide self-deception into enhancement and denial.

Depressive Symptomatology. The hypothesis that depressive symptomatology would be higher among smokers than either ex-smokers or non-smokers was not supported by this research. Nevertheless, after controlling for socially desirable responding, groups were found to differ with respect to this measure. Non-smokers, however, were found to have higher scores on depressive symptomatology than either ex-smokers or smokers. Further study into this issue is required to determine if this

finding would be supported in a larger sample of cardiac patients, and if so, the question of why this is true in a medical population and not in the general population needs to be addressed.

A possible explanation for this seemingly paradoxical finding may be that non-smokers who have had a heart attack are looking for a reason or cause. Specifically, depressive symptomatology may be higher in the non-smoking MI patient compared to the smoker since he/she is searching for a reason for his/her heart attack. After having a heart attack, the smoker may become more aware of the risks associated with his/her behaviour and be less likely to engage in this causal search. Knowing that smoking increases one's risk of developing heart disease, the non-smoker may be emotionally burdened with the question of "Why me?". This interpretation is consistent with previous research that reports that causal thinking has an impact on mood (Jacobsen, Lowery & McCauley, 1992; Lowery, Jacobsen & McCauley, 1987). In a sample of 83 heart attack patients, those who reported not having thought about "Why me?" had better mood scores than did patients who searched for a reason (Lowery et al., 1987). Further research is required to test this hypothesis, however, since it is unknown if causal search differs among smokers, ex-smokers, and non-smokers.

Social Intimacy

The hypothesis that smokers would have lower social intimacy scores compared to ex-smokers and non-smokers was not supported in this study. A number of factors may have had an impact on the results of this analysis. Further research in this area is warranted.

Firstly, the hypothesis that smokers would have lower social intimacy scores than ex-smokers and non-smokers was formulated from two different lines of research. One

line of research strictly looked at the relationship between social intimacy and depression (Cohen & Wills, 1985; Ell & Haywood, 1984; Hotz et al., 1991; Waltz et al., 1988), whereas the second line of research looked at the relationship between smoking and depression (Haire-Joshu et al., 1994; Hall et al., 1993; Manning et al., 1989). Perhaps the rationale used to formulate this hypothesis was too simplistic (i.e. if social intimacy and smoking are both related to depression, then social intimacy may be related to smoking behaviour). Perhaps other factors, such as the social networks to which one belongs (Cohen, 1988) were at play. Specifically, it may be that patients who participated in this study were involved in relationships with people who directly or covertly supported their smoking behaviour. This may reduce conflict in the relationship, in that the partner may be less likely than a non-smoking partner to encourage the patient to quit smoking. It may be, therefore, that smokers, ex-smokers and non-smokers do not differ in the relative levels of intimacy in their relationships, rather they may differ in the kind of relationships in which they are engaged. Further research is needed to explore this issue, since spouses of MI patients were not included in this study.

Another potential reason for the non-significant finding is the fact that the majority of participants in this study reported being married or living common-law. While being married does not necessitate having an intimate relationship, it is possible that the combination of being married and having had a heart attack may mobilize the social support network (Schwarzer & Leppin, 1991). This mobilization may result in the relationship being perceived by the patient as highly intimate.

Another problem that is related to the fact that the majority of patients reported being married or living common-law is that individuals who reported not being involved in a relationship at the time of the study were unable to complete the MSIS. This

resulted in missing data for this particular variable. Alternatively, a score of zero could have been substituted for these individuals. Given the high scores for those participants who reported being involved in a relationship, however, the individuals with substituted scores would have been identified as outliers in the preliminary data screening and would have been deleted from the analyses. There was no way, therefore, to adequately assess this relationship given the present sample.

Another potential problem is the measure used to assess social intimacy. Specifically, social support, like denial, is a complex phenomenon. The instrument used in this research provided a single index of maximum level of social intimacy experienced by the patient. Some researchers (Ben-Sira & Eliezer, 1990; King, Reis, Porter & Norsen, 1993) might argue that this instrument does not adequately assess social support. King and colleagues (1993) have distinguished among five kinds of social support (appraisal, esteem, belonging, closeness, and tangible). Among patients recovering from coronary artery bypass grafting (CABG), the perception of esteem support (i.e. feedback that one is valued and respected by others) was the most strongly associated with emotional outcome. Similar findings were reported by Ben-Sira and Eliezer (1990). Despite this potential criticism of the measure of social intimacy, however, the Miller Social Intimacy Scale does appear to assess esteem/affective support.

Further research should be conducted with respect to smoking status and social intimacy in the cardiac population. When choosing an instrument to measure social intimacy, the potential problem of individuals not involved in relationships should be addressed. Perhaps a more complete instrument of social support/intimacy (i.e. one that assesses various aspects of social support) should also be considered to determine if smokers, ex-smokers, and non-smokers differ with respect to the various sources of

social support. Where a single measure of social intimacy is required, the Miller Social Intimacy Scale should continue to be used.

Part B

In Part B, an attempt was made to identify in-hospital factors that would predict depressive symptomatology two-months post-MI. This would ultimately enable health care professionals to identify patients who are at risk for depression and thereby at an increased risk of mortality (Lespérance et al., 1996).

Eight potential predictors were identified for use in this analysis -- smoking status, defensiveness, functional status, vulnerability to reinfarction, social intimacy, perceived health status, confidence in making one's lifestyle more heart healthy, and feeling at risk of slipping into lifestyle habits that increase the risk of heart disease. Based on the correlations among these predictors and depressive symptomatology at Time 2, three of the eight variables (perceived health status, confidence in making one's lifestyle more heart healthy, and feeling at risk of slipping into lifestyle habits that increase the risk of heart disease) were used in the standard multiple regression analysis.

Smoking status was not found to be significantly correlated with depressive symptomatology at Time 2. This was not expected given that previous research has identified a relationship between smoking status and depression (Haire-Joshu et al., 1994; Hall et al., 1993; Manning et al., 1989) and that depressive symptomatology in this sample of cardiac patients, albeit collapsed across time, was found to differ among the smoking groups in Part A. One possible explanation for this non-significant relationship may be that characteristics that have been found to differ among smokers,

ex-smokers, and non-smokers (e.g., confidence and self-efficacy) may be related more to emotional outcome than smoking status itself. This would at least partially explain the significant correlations, in this sample of MI patients, between depressive symptomatology and: (i) confidence in making lifestyle more heart healthy, and (ii) perceived risk of slipping into lifestyle behaviours that increase the risk of CHD.

Despite non-inclusion of smoking status in the regression analysis, the three predictor variables (perceived health status, confidence in making lifestyle more heart healthy, and perceived risk of slipping into lifestyle behaviours that increase the risk for CHD) were found to account for 31% of the variance in depressive symptomatology two months post-discharge.

It is encouraging that despite the small sample, a significant proportion of the variance, albeit relatively small (31%), in depressive symptomatology can be attributed to factors that can be assessed while the patient is still in the hospital. It is of interest to note that two of the variables identified as key predictors of depressive symptomatology (confidence in making lifestyle more heart healthy and perceived risk of slipping into lifestyle behaviours that increase the risk of CHD -- both measures of self-efficacy) have also been reported to contribute to successful smoking cessation (Prochaska & DiClemente, 1984). Based on these findings, self-efficacy may be seen as contributing substantially to well-being and quality of life.

The fact that perceived risk of slipping into lifestyle behaviours that increase the risk of CHD was identified as the most important independent predictor of depressive symptomatology underscores the importance of assessing a person's beliefs regarding certain situations and experiences. If the behaviours that the person feels he/she are at risk of slipping into can be identified, then programs can be developed to help combat this fear. By targeting these fears, perhaps these patients will build up more confidence

in maintaining a healthy lifestyle, which may have an impact on the person's emotional health. While this study did not look at perceived pros and cons for behaviour change, these variables may also have an impact on emotional health. Specifically, Prochaska and DiClemente (1984) argue that effective behaviour change requires the cons of the behaviour to outweigh the pros. When this occurs, confidence and self-efficacy are likely to increase and perhaps resulting in more positive emotional health.

Finally, these results highlight the importance of examining not only objective clinical variables, such as those studied by Lespérance and colleagues (1996), but also subjective characteristics when attempting to identify patients at risk for post-discharge depressive symptomatology. It may be that personal fears or subjective feelings of one's state of health play a more important role than clinical status in how a person will adjust following a heart attack.

Further study is needed to identify additional variables that could potentially predict post-discharge depression/depressive symptomatology. Perceived health status, confidence in making lifestyle more heart healthy, and perceived risk of slipping into lifestyle behaviours that increase the risk of CHD should be re-examined using a larger sample of MI patients. Vulnerability to reinfarction, and self-reported functional status should also be reconsidered.

Limitations of this Study and Directions for Future Research

The sample size (N=40) obtained for the current study is indeed the major limitation, decreasing statistical power of the tests. The number of statistical tests performed on the data also posed a problem by increasing the chance of obtaining a

statistically significant result. No correction was made for this (for example, using an alpha level of .01).

The fact that only three patients (4% of the 74 initial MI patients) were excluded from the study due to a psychiatric history is also a potential limitation. This proportion seems low compared to that observed by Lespérance and colleagues (1996). Specifically, these researchers found almost one-third of the cardiac patients in their study to have had a major depressive episode prior to the MI. Interestingly enough, only one-third of these individuals reported talking to a physician and/or taking medication at least once for the depression. It may be possible, therefore, that in the present study, some of the patients that were included in the analyses had a previous history of depression, or other psychiatric disorder, that was not recorded in the medical chart. This may have had an impact on the results.

Some individuals may question the use of certain statistical procedures (i.e. multivariate techniques and ANCOVA). Specifically, with such a small n in each group, the use of multivariate statistics is questionable, although the absolute minimum requirement for there to be more cases than dependent variables in the analysis (Tabachnik & Fidell, 1989) was satisfied in the current study.

ANCOVA was used to assess group differences in depressive symptomatology, after socially desirable responding was statistically controlled. McCrae and Costa (1983) have questioned the practice of statistically controlling for this variable, while Holden and Fekken (1989) argue that the goal of assessment is to separate stable sources of variance regardless of whether or not they are associated with a particular response style or personality characteristic. It seems that the only way to identify factors that have an association with variables of interest is to remove the influence of other known extraneous variables.

Despite these limitations, the results of this study point to two areas that warrant further exploration with a larger sample: (i) defensiveness/socially desirable responding, and (ii) depressive symptomatology.

Defensiveness. Additional research needs to determine if the trend reported with this data (i.e. that non-smokers are more defensive than smokers and ex-smokers) remains stable when a larger sample size is used and statistical power is increased. If this is in fact the case, then potential reasons for this phenomenon need to be explored.

Depressive Symptomatology. Two issues with the subject of depression and emotional outcome following AMI require further exploration. Firstly, the findings from the current study (i.e. that depressive symptomatology is higher among non-smokers than smokers) need to be replicated with a larger sample in order to increase statistical power. If this trend is found, then potential reasons for this phenomenon need to be explored. One venue might be to address the "Why me?" phenomenon to determine if the hypothesis that non-smokers may be more likely to search for a cause for their heart attack since they don't engage in unhealthy lifestyle behaviours, such as smoking.

The second issue deals with the prediction of post-discharge depressive symptomatology. Specifically, in-hospital variables that can help identify patients at risk for post-discharge depressive symptomatology may ultimately prevent unnecessary emotional suffering and premature mortality. Variables identified in this study account for almost one-third of the variance in depressive symptomatology two-months post-discharge. Nevertheless, two-thirds of the variance remains unaccounted.

Results from this study strongly suggest that characteristics of the general smoking population may not be the same characteristics displayed in a medical population. An event that puts one's health, and life, at risk may change what is strongly supported by the research literature. Specifically, the hypotheses that were put forth in this study, to a large extent, were not supported. In a few instances, the findings were contrary to what was predicted. Nevertheless, this research has indicated that smoking status is related to emotional outcome and that it may be possible to identify patients at risk for post-discharge depression/depressive symptomatology while they are still in the hospital.

References

- Aberg, A. Bergstrand, R., Johansson, S., Ulvenstam, G., Vedin, A., Wedel, H., Wilhelmsson, C. & Wilhelmsen, L. (1983). Cessation of smoking after myocardial infarction: Effects on mortality after 10 years. *British Heart Journal*, 49, 416-422.
- Ben-Shlomo, Y., Smith, G.D., Shipley, M.J. & Marmot, M.G. (1994). What determines mortality risk in male former cigarette smokers? *American Journal of Public Health*, 84 (8), 1235-1242.
- Ben-Sira, Z. & Eliezer, R. (1990). The structure of readjustment after heart attack. *Social Science & Medicine*, 30 (5), 523-536.
- Bennett, S.J. (1992). Perceived threats of individuals recovering from myocardial infarction. *Heart & Lung*, 21 (4), 322-326.
- Blumenthal, J.A., Bradley, W., Dimsdale, J.E., Kasl, S.V., Powell, L.H. & Taylor, C.B. (1989). Task Force III: Assessment of psychological status in patients with ischemic heart disease. *Journal of the American College of Cardiology*, 14 (4), 1034-1042.
- Booth-Kewley, S. & Friedman, H.S. (1987). Psychological predictors of heart disease: A quantitative review. *Psychological Bulletin*, 101 (3), 343-362.
- Christman, N.J., McConnell, E.A., Pfeiffer, C., Webster, K.K., Schmitt, M. & Ries, J. (1988). Uncertainty, coping, and distress following myocardial infarction. Transition for hospital to home. *Research in Nursing & Health*, 11, 71-82.
- Cohen, S. (1988). Psychosocial models of the role of social support in the etiology of physical disease. *Health Psychology*, 7 (3), 269-297.
- Cohen, S. & Wills, T.A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98 (2), 310-357.

Comments on Shaper's "Alcohol and mortality: A review of prospective studies".
(1990). *British Journal of Addiction*, 85, 849-857.

Comments on West's Editorial "Beneficial effects of nicotine: Fact or fiction?".
(1994). *Addiction*, 89, 135-146.

Corse, C.D., Manuck, S.B., Cantwell, J.D., Giordani, B. & Matthews, K.A. (1982).
Coronary-prone behavior pattern and cardiovascular response in persons with and
without coronary heart disease. *Psychosomatic Medicine*, 44 (5), 449-459.

Cronin, S.N. (1990). Psychological adjustment to coronary artery disease:
Current knowledge and future directions. *Journal of Cardiovascular Nursing*, 5 (1),
13-24.

Croog, S.H., Levine, S., Testa, M.A., Brown, B., Bulpitt, C.J., Jenkins, D.,
Klerman, G.L. & Williams, G.H. (1986). The effects of antihypertensive therapy on the
quality of life. *The New England Journal of Medicine*, 314 (26), 1657-1664.

Daly, L.E., Mulcahy, R., Graham, I.M. & Hickey, N. (1983). Long term effect on
mortality of stopping smoking after unstable angina and myocardial infarction. *British
Medical Journal*, 287, 324-326.

de Leo, D., Caracciolo, S., Berto, F., Mauro, P., Magni, G. & Miraglia, G. (1986).
Type A behavior patterns and mortality after recurrent myocardial infarction:
Preliminary results from a follow-up study of 5 years. *Psychotherapy &
Psychosomatics*, 46, 132-137.

Dembroski, T.M., MacDougall, J.M., Costa, P.T., Jr., & Grandits, G.A. (1989).
Components of hostility as predictors of sudden death and myocardial infarction in the
Multiple Risk Factor Intervention Trial. *Psychosomatic Medicine*, 51, 514-522.

Derogatis, L.R. (1992). *The Brief Symptom Inventory (BSI): Administration,
Scoring & Procedures Manual - II*. Clinical Psychometric Research Inc.

DiClemente, C.C., Prochaska, J.O., Fairhurst, S.K., Velicer, W.F., Velasquez, M.M. & Rossi, J.S. (1991). The process of smoking cessation: An analysis of precontemplation, contemplation, and preparation stages of change. *Journal of Consulting and Clinical Psychology*, 59 (2), 295-304.

Dimsdale, J.E. & Hackett, T.P. (1982). Effect of denial on cardiac health and psychological assessment. *American Journal of Psychiatry*, 139 (11), 1477-1480.

Dimsdale, J.E., Hackett, T.P., Block, P.C. & Hutter, A.M. Jr. (1978). Emotional correlates of Type A behavior pattern. *Psychosomatic Medicine*, 40 (7), 580-583.

Doehrman, S.R. (1977). Psycho-social aspects of recovery from coronary heart disease: A review. *Social Science and Medicine*, 11, 199-218.

Ell, K. & Haywood, L.J. (1984). Social support and recovery from myocardial infarction: A panel study. *Journal of Social Service Research*, 7 (4), 1-19.

Epstein, L.H. & Perkins, K.A. (1988). Smoking, stress, and coronary heart disease. *Journal of Consulting and Clinical Psychology*, 56 (3), 342-349.

Esteve, L.G., Valdés, M., Riesco, N., Jódar, I. & De Flores, T. (1992). Denial mechanisms in myocardial infarction: Their relations with psychological variables and short-term outcome. *Journal of Psychosomatic Research*, 36 (5), 491-496.

Fielding, R. (1991). Depression and acute myocardial infarction: A review and reinterpretation. *Social Science & Medicine*, 32 (9), 1017-1027.

Fishbein, M. (1979). A Theory of Reasoned Action: Some applications and implications. *Nebraska Symposium on Motivation*, 65-116.

Fitzgerald, D., Litt, J., Ciliska, D., Delmore, B. & Butson, T. (1984). Health consequences of selected lifestyle factors: A review of the evidence. *Canadian Family Physician*, 30, 2548-2554.

- Frasure-Smith, N., Lespérance, F. & Talajic, M. (1993). Depression following myocardial infarction: Impact on 6-month survival. *Journal of the American Medical Association*, 270 (15), 1819-1825.
- French, S.A., Perry, C.L., Leon, G.R. & Fulkerson, J.A. (1994). Weight concerns, dieting behavior, and smoking initiation among adolescents: A prospective study. *American Journal of Public Health*, 84 (11), 1818-1820.
- Gilbert, D.G. & Welser, R. (1989). Emotion, anxiety and smoking. In T. Ney & A. Gale (Eds.) *Smoking and Human Behaviour* (pp. 171-196).
- Goldman, L. & Cook, E.F. (1984). The decline in ischemic heart disease mortality rates. *Annals of Internal Medicine*, 101, 825-836.
- Goldstein, M.G. & Niaura, R. (1992). Psychological factors affecting physical condition: Cardiovascular disease literature review. *Psychosomatics*, 33 (2), 134-145.
- Griego, L.C. (1993). Physiologic and psychologic factors related to depression in patients after myocardial infarction: A pilot study. *Heart & Lung*, 22 (5), 392-400.
- Haire-Joshu, D., Heady, S., Thomas, L., Schechtman, K. & Fisher, E.B., Jr. (1994). Depressive symptomatology and smoking among persons with diabetes. *Research in Nursing and Health*, 17, 273-282.
- Hall, S.M., Munoz, R.F., Reus, V.I. & Sees, K.L. (1993). Nicotine, negative affect, and depression. *Journal of Consulting and Clinical Psychology*, 61 (5), 761-767.
- Halpern, M.T. & Warner, K.E. (1994). Differences in former smokers' beliefs and health status following smoking cessation. *American Journal of Preventive Medicine*, 10 (1), 31-37.

Hamburg, D.A., Elliott, G.R. & Parron, D.L. (1982). *Health and Behaviour Frontiers of Research in the Biobehavioural Sciences*. Washington, DC: National Academy Press.

Havik, O.E. & Maeland, J.G. (1988). Verbal denial and outcome in myocardial infarction patients. *Journal of Psychosomatic Research*, 32 (2), 145-157.

Health Canada. (August 1994). *Survey on Smoking in Canada: Cycles 1 and 2*. Ottawa, ON: Government of Canada, Health Canada.

Health Canada. (February 1995). *Survey on Smoking in Canada: Cycle 3*. Ottawa, ON: Government of Canada, Health Canada.

Heart and Stroke Foundation of Canada. (February 1993). *Cardiovascular Disease in Canada 1993*. Toronto, ON: Heart and Stroke Foundation of Canada

Hirdes, J.P. & Maxwell, C.J. (1994). Smoking cessation and quality of life outcomes among older adults in the Campbell's Survey on Well-Being. *Canadian Journal of Public Health*, 85 (2), 99-102.

Hlatky, S.G., Boineau, R.E., Higginbotham, M.B., Lee, K.L., Mark, D.B., Califf, R.M., Cobb, R.F. & Pryor, D.B. (1989). A brief self-administered questionnaire to determine functional capacity (The Duke Activity Status Index). *The American Journal of Cardiology*, 64, 651-654.

Holden, R.R. & Fekken, G.C. (1989). Three common social desirability scales: Friends, acquaintances, or strangers? *Journal of Research in Personality*, 23, 180-191.

Hotz, S.B., Cazabon, A.M., O'Farrell, P. & Robbins, B. (1991). Adjustment to heart disease: Helping families cope. *Canadian Family Physician*, 37, 641-647

Houston, B.K. & Vavak, C.R. (1991). Cynical hostility: Developmental factors, psychosocial correlates, and health behaviors. *Health Psychology*, 10 (1), 9-17.

2 OF 2

PM-1 3 1/2" x 4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT

PRECISIONSM RESOLUTION TARGETS

- Jacobsen, B.S., Lowery, B.J. & McCauley, K. (1992). Why me? Causal thinking, affect, and expectations in myocardial infarction patients. *Journal of Cardiovascular Nursing*, 6 (2), 57-65.
- Jeffery, R.W. (1989). Risk behaviors and health: Contrasting individual and population perspectives. *American Psychologist*, 44 (9), 1194-1202.
- Johansen, H., Nargundkar, M., Nair, C., Neutel, I. & Wielgosz, A. (1990). Women and cardiovascular disease. *Chronic Diseases in Canada*, 11 (3), 41-47.
- Kaufmann, M.W., Pasacreta, J., Cheney, R. & Arcuni, O. (1985-86). Psychosomatic aspects of myocardial infarction and implications for treatment. *International Journal of Psychiatry in Medicine*, 15 (4), 371-380.
- Kawachi, I., Colditz, G.A., Stampfer, M.J., Willett, W.C., Manson, J.E., Rosner, B., Hunter, D.J., Hennekens, C.H. & Speizer, F.E. (1993). Smoking cessation in relation to total mortality rates in women: A prospective cohort study. *Annals of Internal Medicine*, 119 (10), 992-1000.
- King, K.B., Reis, H.T., Porter, L.A. & Norsen, L.H. (1993). Social support and long-term recovery from coronary artery surgery: Effects of patients and spouses. *Health Psychology*, 12 (1), 56-63.
- Kviz, F.J., Clark, M.A., Crittenden, K.S., Warnecke, R.B. & Freels, S. (1995). Age and smoking cessation behaviors. *Preventive Medicine*, 24, 297-307.
- Ladwig, K.H., Kieser, M., König, J., Breithardt, G. & Borggrefe, M. (1991). Affective disorders and survival after acute myocardial infarction: Results from the post-infarction late potential study. *European Heart Journal*, 12, 959-964.
- Lakier, J.B. (1992). Smoking and cardiovascular disease. *The American Journal of Medicine*, 93 (suppl. 1A), 8S-12S.

Lalonde, M. (1974). *A New Perspective on the Health of Canadians: A Working Document*. Ottawa, ON: Government of Canada.

Lespérance, F., Frasure-Smith, N. & Talajic, M. (1996). Major depression before and after myocardial infarction: Its nature and consequences. *Psychosomatic Medicine*, 58, 99-110.

Levine, J., Warrenburg, S., Kerns, R., Schwartz, G., Delaney, R., Fontana, A., Gradman, A., Smith, S., Allen, S. & Cascione, R. (1987). The role of denial in recovery from coronary heart disease. *Psychosomatic Medicine*, 49 (2), 109-117.

Lowery, B.J., Jacobsen, B.S. & McCauley, K. (1987). On the prevalence of causal search in illness situations. *Nursing Research*, 36 (2), 88-93.

Manning, M.R., Osland, J.S. & Osland, A. (1989). Work-related consequences of smoking cessation. *Academy of Management Journal*, 32 (3), 606-621.

Marshall, P. (1990). "Just one more...!" A study into the smoking attitudes and behaviour of patients following first myocardial infarction. *International Journal of Nursing Studies*, 27 (4), 375-387.

Matthews, K.A. (1989). Are sociodemographic variables markers for psychological determinants of health? *Health Psychology*, 8 (6), 641-648.

Matthews, K.A. (1988). Coronary heart disease and Type A behaviors: Update on and alternative to the Booth-Kewley and Friedman (1987) quantitative review. *Psychological Bulletin*, 104 (3), 373-380.

McCrae, R.R. & Costa, P.T., Jr. (1983). Social desirability scales: More substance than style. *Journal of Consulting and Clinical Psychology*, 51 (6), 882-888.

Miller, R.S. & Lefcourt, H.M. (1982). The assessment of social intimacy. *Journal of Personality Assessment*, 46 (5), 514-518.

Mulcahy, R. (1983). Influence of cigarette smoking on morbidity and mortality after myocardial infarction. *British Heart Journal*, 49, 410-415.

Niaura, R. & Goldstein, M.G. (1992). Psychological factors affecting physical condition: Cardiovascular disease literature review -- Part II: Coronary artery disease and sudden death and hypertension. *Psychosomatics*, 33 (2), 146-155.

Nicholls, E., Nair, C., MacWilliam, L., Moen, J. & Mao, Y. (December 1986). *Cardiovascular Disease in Canada*. Ottawa, ON: Statistics Canada/Health and Welfare Canada.

Nolan, R.P. & Wielgosz, A.T. (1991). Assessing adaptive and maladaptive coping in the early phase of acute myocardial infarction. *Journal of Behavioural Medicine*, 14, 111-124.

Ontario Ministry of Health. (1991). *Tobacco and your health: Report of the Chief Medical Officer of Health*. Ottawa, ON: Government of Ontario, Ministry of Health.

Parchman, M.L. (1991). Recognition of depression in patients who smoke. *The Journal of Family Practice*, 33 (3), 255-258.

Paulhus, D.L. (1991). *BIDR Reference Manual for Version 6*. British Columbia: University of British Columbia.

Paulhus, D.L. & Reid, D.B. (1991). Enhancement and Denial in Socially Desirable Responding. *Journal of Personality and Social Psychology*, 60, 334-356.

Perkins, K.A. (1993). Weight gain following smoking cessation. *Journal of Consulting and Clinical Psychology*, 61 (5), 768-777.

Prochaska, J.O. (1989). What causes people to change from unhealthy to health enhancing behaviour? In C.C. Cummings & J.D. Floyd (Eds.), *Human Behavior and Cancer Risk Reduction: Overview and Report of a Conference on Unmet Research Needs* (pp. 30-34). Atlanta, GA: American Cancer Society.

- Prochaska, J.O. & DiClemente, C.C. (1984). Self change processes, self-efficacy and decisional balance across five stages of smoking cessation. In *Advances in Cancer Control* (pp.131-140). New York: Alan R. Liss, Inc.
- Prochaska, J.O. & DiClemente, C.C. (1992). Stages of change in the modification of problem behaviours. In M. Hersen, R.M. Eisler & P.M. Miller (Eds.), *Progress in Behavior Modification* (pp.184-218). Newbury Park, CA: Sage Publications.
- Prochaska, J.O., Velicer, W.F., DiClemente, C.C. & Fava, J. (1988). Measuring processes of change: Applications to the cessation of smoking. *Journal of Consulting and Clinical Psychology*, 56 (4), 520-528.
- Rose, M. (1989). *Cardiac norms and predictive validity: An update*. Paper presented at CPA, Halifax, Nova Scotia.
- Schwarzer, R. & Leppin, A. (1991). Social support and health: A theoretical and empirical overview. *Journal of Social and Personal Relationships*, 8, 99-127.
- Shaper, A.G. (1990). Alcohol and mortality: A review of prospective studies. *British Journal of Addiction*, 85, 837-847.
- Sherk, C., Thomas, H., Wilson, D.M.C. & Evans, C.E. (1985). Health consequences of selected lifestyle factors: A review of the evidence, part 2. *Canadian Family Physician*, 31, 129-139.
- Singer, B.A. (1987). The psychological impact of a myocardial infarction on the patient and family. *Psychotherapy in Private Practice*, 5 (3), 53-63.
- Sutton, S. (1989). Smoking attitudes and behavior: Applications of Fishbein and Ajzen's Theory of Reasoned Action to predicting and understanding smoking decisions. In T. Ney & A. Gale (Eds.) *Smoking and Human Behaviour* (pp. 289-312). New York: John Wiley & Sons.

Tabachnick, B.G. & Fidell, L.S. (1989). *Using Multivariate Statistics (Second Edition)*. New York: Harper Collins Publishers.

Thompson, D.R., Webster, R.A., Cordle, C.J. & Sutton, T.W. (1987) Specific sources and patterns of anxiety in male patients with first myocardial infarction. *British Journal of Medical Psychology*, 60, 343-348.

Trelawny-Ross, C. & Russell, O. (1987). Social and psychological responses to myocardial infarction: Multiple determinants of outcome at six months. *Journal of Psychosomatic Research*, 31 (1), 125-130.

Tryon, R.C. (1966). Unrestricted cluster and factor analysis with application to the MMPI and Holzinger-Harman problem. *Multivariate Behavioral Research*, 1, 299-344.

Velicer, W.F., DiClemente, C.C., Rossi, J.S. & Prochaska, J.O. (1990). Relapse situations and self-efficacy: An integrative model. *Addictive Behaviors*, 15, 271-283.

Waltz, M., Badura, B., Pfaff, H. & Schott, T. (1988). Marriage and the psychosocial consequences of a heart attack: A longitudinal study of adaptation to chronic illness after 3 years. *Social Science & Medicine*, 27 (2), 149-158.

Warrenburg, S., Levine, J., Schwartz, G.E., Fontana, A.F., Kerns, R.D., Delaney, R. & Mattson, R. (1989). Defensive coping and blood pressure reactivity in medical patients. *Journal of Behavioural Medicine*, 12 (5), 407-424.

West, R. (1993). Beneficial effects of nicotine: Fact or fiction? *Addiction*, 88, 589-590.

Wielgosz, A.T.J., Nolan, R.P., Earp, J.A., Biro, E. & Wielgosz, M.B. (1988). Reasons for patients' delay in response to symptoms of acute myocardial infarction. *Canadian Medical Association Journal*, 139, 853-857.

- Wigle, D.T., Mao, Y., Semenciw, R., McCann, C. & Davies, J.W. (1990). Premature deaths in Canada: Impact, trends and opportunities for prevention. *Canadian Journal of Public Health*, 81 (September/October), 376-381.
- Wiggins, J.S. (1966). Dimensions of self-report in the MMPI item pool. *Psychological Monographs*, 80 (22, whole No. 630).
- Wiklund, I., Oden, A., Sanne, H., Ulvenstam, G., Wilhelmsson, C. & Wilhelmsen, L. (1988). Prognostic importance of somatic and psychosocial variables after a first myocardial infarction. *American Journal of Epidemiology*, 128 (4), 786-795.
- Wiklund, I., Sanne, H., Vedin, A. & Wilhelmsson, C. (1984). Psychosocial outcome one year after a first myocardial infarction. *Journal of Psychosomatic Research*, 28 (4), 309-321.
- Woodward, M., Bolton-Smith, C. & Tunstall-Pedoe, H. (1994). Deficient health knowledge, diet, and other lifestyles in smokers: Is a multifactorial approach required? *Preventive Medicine*, 23, 354-361.

**Appendix A: Verbal Instructions to Patient
(In-hospital Visit)**

Hello [patient's name], my name is [researcher's name] and I am a research assistant for Dr. Nolan who is a Health Psychologist and part of the cardiology team here at the Ottawa General Hospital. The purpose of my visit today, is to tell you about the research project that Dr. Nolan and I are conducting that looks at how patients cope with their symptoms following a heart attack and overall adjustment. The study involves patients completing a questionnaire package twice -- once while in hospital, or soon after discharge, and again in about two months time. The questionnaire package takes approximately one hour to complete. I would like to stress that you are not obligated to take part in this study and if you decide that you would not like to participate, the medical treatment you receive will not be affected in any way. I would also like to point out that this is a project aimed at gathering information, and that you will not be receiving any treatment or services from the psychology department as a result of this study. Do you think you might be interested in taking a look at the questionnaire package?

If patient responded "Yes":

[A questionnaire package was given to them, along with a stamped envelope] Here is a copy of the questionnaire package. On the inside page is an information sheet [open to the information page] that describes the study and also gives you a list of contacts should you have any questions or concerns regarding the project. If you decide that you are willing to participate, please sign the consent form [turn to consent form and indicate where patient should sign; the paragraph regarding treatment and examinations was pointed out and it was stressed again that the patient would not be receiving any treatment or exams as a result of participating in this research project], complete the questionnaire package, and return it to me using the envelope I gave you. Do not hesitate to call me if you have any questions. If I have not heard from you, I will call you in about a week's time to remind you to return the package as soon as possible. Do you have any questions? [questions were answered and patient was thanked for his/her time and wished the best for recovery].

If patient responded "No":

Thank you for your time, and I wish you the best in your recovery.

Appendix B: Patient Information Sheet

The Health Psychology Section, of the Department of Psychology at the Ottawa General Hospital is conducting a research project on how patients adjust their lifestyle following a heart attack. To participate in this study, you will need to complete a set of questionnaires which will ask you about your lifestyle, as well as how you are adjusting your behaviour through your recovery from your heart attack. The questionnaire package will likely take you about 60-90 minutes to complete. It will be completed twice--once during your hospital stay, and again two months following this initial assessment. Since this is an information gathering project only, you will NOT be asked to change any aspect of the treatment plan that your health care team has prescribed for you.

It is also important for you to know that the quality of the treatment for your heart condition will in no way be affected if you decide that you are not interested in participating in this project.

If you choose to participate in this study, however, you will be helping our research team to gain important information on how patients naturally cope with their heart condition, and how heart attacks affect the patient's lifestyle. In addition, you will be able to withdraw your participation from this study at any time, without compromising the high quality of treatment services that will be provided to you.

If you are interested in participating in this study, please read and sign the attached Patient Consent Form. If you would like further information about this project, please speak with the research assistant who provided you with this form. You may also call Dr. Nolan, in the Department of Psychology at the Ottawa General Hospital, who can be contacted at 737-8039.

Thank you for considering this matter.

This protocol has been approved by the Human Experimental Procedures Committee of the Ottawa General Hospital. This committee considers the ethical aspects of all hospital research projects using human subjects. If you wish, you may talk to the Chairperson of the Human Experimental Procedures Committee - Dr. G.D. Goss, at 737-6792.

If you have any concerns about the way you were treated during the study, please contact Dr. Lise Paquet (Chair of the Carleton University Ethics Committee) at 788-2600 extension 2692, or Dr. Bill Jones (Chair of the Graduate Studies Committee, Department of Psychology, Carleton University) at 788-2600 extension 2648.

If you have any concerns regarding any of the questions in the questionnaire package or would like more information on the services that are offered by the the Psychology Department at the Hospital, please call Dr. Robert P. Nolan (Co-Ordinator, Health Psychology, Ottawa General Hospital) at 737-8628.

Appendix C: Informed Consent

HÔPITAL GÉNÉRAL
D'OTTAWA
301 Smyth, Ottawa, Ontario K1H 8L4

CONSENTEMENT À DES RECHERCHES MÉDICALES

CONSENT FOR MEDICAL RESEARCH

Nom de l'étude	Name of research project	
ADAPTIVE AND MALADAPTIVE COPING WITH CARDIAC SYMPTOMS		
Chercheur	Researcher	
	Dr. Robert P. Nolan	
Je consens à la participation de.	I consent to the participation of	
(patient)	(patient)	
à l'étude précitée et j'autorise par la présente le(s) et chercheurs(s) à procéder aux examens et/ou à dispenser les traitements suivants:	in the above study and hereby authorize the physician(s) and investigator(s) to proceed with the following examinations and/or to administer these treatments	
	Questionnaire Assessment	
J'ai reçu une explication détaillée de tous les effets secondaires et des risques connus ayant trait aux examens et aux traitements.	I have had a detailed description of all the known side effects and risks related to the examinations and treatments	
J'ai également reçu une description de tous les avantages à attendre de ces examens et de ces traitements. On m'a fait connaître d'autres formes d'examens et de traitements.	I have also received a description of any benefits that may be expected from these examinations and treatments have been disclosed to me	
J'ai eu l'occasion de poser des questions au sujet de ces examens et de ces traitements et on y a bien répondu.	I have been given an opportunity to ask questions concerning the examinations and treatments involved and the questions which I have asked have been adequately answered	
On m'a dit que je pouvais retirer mon consentement et suspendre ma participation à l'étude à n'importe quel moment et pour quelque motif que ce soit	I have been told that I can withdraw my consent and stop my participation in the study at any time and for any reason.	
En toute connaissance de cause, je consens volontairement à participer à cette étude.	With full knowledge of this, I voluntarily consent to participate in the study	
Nom-Name	Signature	Lien de parenté-Relationship
(PATIENT OU PERSONNE LEGALEMENT RESPONSABLE-PATIENT OR PERSON LEGALLY RESPONSIBLE)		
1		
Nom du témoin-Name of witness	Signature	Date (y/d-m/m-ann)
Un deuxième témoin est requis si le consentement est obtenu par téléphone A second witness is required if consent is obtained by telephone		
2		
Nom du témoin-Name of witness	Signature	Date (y/d-m/m-ann)

Appendix D: Sociodemographics Questionnaire

INSTRUCTIONS: For each question below, please indicate your response by placing a check mark in the box provided or writing your answer in the space provided.

1. Are you: ☐ Male ☐ Female
2. What is your age? _____
3. What is your height (without shoes)? _____ ft/in _____ cm
4. What is your weight? _____ lbs _____ kg
5. What is the highest level of education you have obtained:
- ☐ less than high school
 - ☐ completed high school
 - ☐ some post high-school but not certified, etc.
 - ☐ community college or CEGEP diploma or equivalent
 - ☐ university degree
6. What is your marital status?
- ☐ single or never married?
 - ☐ married, including common-law?
 - ☐ separated or divorced?
 - ☐ widowed?
7. Does anyone else live in your apartment/home?
- ☐ yes
 - ☐ no
8. a) Is there a history of heart disease in your family
(e.g. father, mother, brother, sister)? ☐ Yes ☐ No
- b) Have you ever been diagnosed with cardiac symptoms
(e.g. angina, hypertension, arrhythmia)? ☐ Yes ☐ No
- c) Have you ever had surgery for cardiac symptoms
(e.g. angioplasty, coronary artery bypass grafting)? ☐ Yes ☐ No

Appendix E: General Health Survey

INSTRUCTIONS: Please answer the following questions based on your present situation. Each question allows you to choose from several alternatives. Please select the best response by placing an "x" in the appropriate box, or by writing your answer in the space provided.

1. Would you say your health in general is:

☐	Excellent
☐	Very Good
☐	Good
☐	Fair
☐	Poor

2. Do you feel that you are under a great deal of unhealthy stress?

☐	Yes	☐	No
--------------------------	-----	--------------------------	----

3. Do you consider yourself overweight?

☐	Yes	☐	No
--------------------------	-----	--------------------------	----

4. Do you smoke cigarettes?

☐	Yes	☐	No
--------------------------	-----	--------------------------	----

5. Have you had your blood cholesterol checked in the past 12 months?

☐	Yes	☐	No
--------------------------	-----	--------------------------	----

6. Do you intend to have your blood cholesterol checked in the next 12 months?

☐	Yes	☐	No
--------------------------	-----	--------------------------	----

7. Have you had your blood pressure checked in the past 12 months?

☐	Yes	☐	No
--------------------------	-----	--------------------------	----

8. Do you intend to have your blood pressure checked in the next 12 months?

☐	Yes	☐	No
--------------------------	-----	--------------------------	----

9. How many drinks of alcohol do you have per week? _____
 (1 drink = one 5 oz. glass of wine, one 12 oz. beer, or one 1.5 oz. shot of liquor)

10. Has a blood relative (parent, grandparent, brother, sister) had any of the following diseases?

BREAST CANCER?	☐ Yes	☐ No	☐ Don't Know
OVARIAN CANCER?	☐ Yes	☐ No	☐ Don't Know
SKIN CANCER?	☐ Yes	☐ No	☐ Don't Know
Any other forms of CANCER?	☐ Yes	☐ No	☐ Don't Know
DIABETES?	☐ Yes	☐ No	☐ Don't Know
HIGH BLOOD CHOLESTEROL?	☐ Yes	☐ No	☐ Don't Know
HIGH BLOOD PRESSURE (HYPERTENSION)?	☐ Yes	☐ No	☐ Don't Know
HEART ATTACK or STROKE before the age of 60?	☐ Yes	☐ No	☐ Don't Know

Right now, how important is it for you to change the behaviours listed below? Circle the appropriate number for each question.

	low importance for change	moderate importance for change	high importance for change
1. Eating high fat and high salt foods	1	2	3
2. Eating a diet high in fibre	1	2	3
3. Losing weight	1	2	3
4. Exercising 3 times a week for at least 20 minutes each time	1	2	3
5. Reducing the amount of alcohol consumed in your daily life	1	2	3
6. Reducing the amount of stress in your daily life	1	2	3
7. To stop smoking cigarettes	1	2	3

INSTRUCTIONS: Please read the following questions and all the possible answers carefully. Choose the best response for each question by placing a check mark in the appropriate box.

1. a) Do you consistently avoid eating high fat and high salt foods?

- ☐ I have always avoided eating high fat and high salt foods
- ☐ YES, I have been for MORE than 5 years.
- ☐ YES, I have been for MORE than 6 months.
- ☐ YES, I have been but for LESS than 6 months.
- ☐ NO, but I intend to in the next 30 days.
- ☐ NO, but I intend to in the next 6 months.
- ☐ NO, and I do NOT intend to in the next 6 months.

2. a) Have you been eating a diet high in fiber?

- ☐ I have always maintained a diet high in fiber.
- ☐ YES, I have been for MORE than 5 years.
- ☐ YES, I have been for MORE than 6 months.
- ☐ YES, I have been but for LESS than 6 months.
- ☐ NO, but I intend to in the next 30 days.
- ☐ NO, but I intend to in the next 6 months.
- ☐ NO, and I do NOT intend to in the next 6 months.

3.a) Have you been trying to lose weight?

- ☐ I have never needed to lose weight.
- ☐ YES, I have been for MORE than 5 years.
- ☐ YES, I have been for MORE than 6 months.
- ☐ YES, I have been but for LESS than 6 months.
- ☐ NO, but I intend to in the next 30 days.
- ☐ NO, but I intend to in the next 6 months.
- ☐ NO, and I do NOT intend to in the next 6 months.

4.a) Do you exercise three times a week for at least 20 minutes each time?

- ☐ I have always engaged in regular physical exercise.
- ☐ YES, I have been for MORE than 5 years.
- ☐ YES, I have been for MORE than 6 months.
- ☐ YES, I have been but for LESS than 6 months.
- ☐ NO, but I intend to in the next 30 days.
- ☐ NO, but I intend to in the next 6 months.
- ☐ NO, and I do NOT intend to in the next 6 months.

5.a) Have you attempted to reduce the amount of alcohol consumed in your daily life?

- ☐ I have never used alcohol on a regular basis.
- ☐ YES, I have been for MORE than 5 years.
- ☐ YES, I have been for MORE than 6 months.
- ☐ YES, I have been but for LESS than 6 months.
- ☐ NO, but I intend to in the next 30 days.
- ☐ NO, but I intend to in the next 6 months.
- ☐ NO, and I do NOT intend to in the next 6 months.

6.a) Have you attempted to reduce the amount of stress in your daily life?

- ☐ I have never been under a lot of stress
- ☐ YES, I have been for MORE than 5 years.
- ☐ YES, I have been for MORE than 6 months.
- ☐ YES, I have been but for LESS than 6 months.
- ☐ NO, but I intend to in the next 30 days.
- ☐ NO, but I intend to in the next 6 months.
- ☐ NO, and I do NOT intend to in the next 6 months.

7.a) Have you quit smoking cigarettes?

- ☐ I have never smoked cigarettes on a regular basis
- ☐ YES, I have been for MORE than 5 years.
- ☐ YES, I have been for MORE than 6 months.
- ☐ YES, I have been but for LESS than 6 months.
- ☐ NO, but I intend to in the next 30 days.
- ☐ NO, but I intend to in the next 6 months.
- ☐ NO, and I do NOT intend to in the next 6 months.

Appendix F: Observed Change In Smoking Status

Figure 3. Change in Stage of Change from Time 1 to Time 2 for the Smoking Group

- * Note that two of these individuals did not complete the assessment package at Time 2, therefore it is unknown as to whether or not their smoking status changed over the two month testing interval.

Appendix G: Duke Activity Status Index

Please indicate how easy it is for you to perform the following activities by circling the appropriate number for each statement.

NOTE: 1 = Yes, it is easy
 2 = Yes, but it is hard
 3 = No, I can't

CAN YOU...

	Yes, it is easy	Yes, but it is hard	No, I can't
1. take care of yourself, that is, eating, dressing, bathing, or using the toilet?	1	2	3
2. walk indoors, such as around your house?	1	2	3
3. walk a block or 2 on ground level?	1	2	3
4. climb a flight of stairs or walk up a hill?	1	2	3
5. run a short distance?	1	2	3
6. do light work around the house like dusting or washing?	1	2	3
7. do moderate work around the house like vacuuming?	1	2	3
8. do heavy work around the house like scrubbing floors, or lifting or moving heavy furniture?	1	2	3
9. do yardwork like raking leaves, weeding or pushing a power mower?	1	2	3
10. have sexual relations?	1	2	3
11. participate in moderate recreational activities like golf, bowling, dancing, doubles tennis, or throwing a baseball or football?	1	2	3
12. participate in strenuous sports like swimming, singles tennis, football, basketball or skiing?	1	2	3

Appendix H: Balanced Inventory of Desirable Responding

Please read each of the following statements and rate your level of agreement using the scale below. Be sure to answer each question.

	Not at all					Very Much	
1. My first impressions of people usually turn out to be right.	1	2	3	4	5	6	7
2. I don't care to know what other people really think of me.	1	2	3	4	5	6	7
3. I always know why I like things.	1	2	3	4	5	6	7
4. Once I've made up my mind, other people can seldom change my opinion.	1	2	3	4	5	6	7
5. I am fully in control of my own fate.	1	2	3	4	5	6	7
6. I never regret my decisions.	1	2	3	4	5	6	7
7. The reason I vote is because my vote can make a difference.	1	2	3	4	5	6	7
8. I am a completely rational person.	1	2	3	4	5	6	7
9. My solutions to problems are original and effective.	1	2	3	4	5	6	7
10. It's alright with me if some people happen to dislike me.	1	2	3	4	5	6	7
11. It would be hard for me to break any of my bad habits.	1	2	3	4	5	6	7
12. I have not always been honest with myself.	1	2	3	4	5	6	7
13. I don't know what my major strengths and weaknesses are.	1	2	3	4	5	6	7
14. I am not a safe driver when I exceed the speed limit.	1	2	3	4	5	6	7
15. It's hard for me to shut off a disturbing thought.	1	2	3	4	5	6	7

	Not at all				Very Much		
16. I sometimes lose out on things because I can't make up my mind soon enough.	1	2	3	4	5	6	7
17. My parents were not always fair when they punished me.	1	2	3	4	5	6	7
18. I rarely appreciate criticism.	1	2	3	4	5	6	7
19. I have sometimes doubted my ability as a sex partner.	1	2	3	4	5	6	7
20. I don't always know the reasons why I do the things I do.	1	2	3	4	5	6	7
21. I never cover up my mistakes.	1	2	3	4	5	6	7
22. I never swear.	1	2	3	4	5	6	7
23. I always obey laws, even if I'm unlikely to get caught.	1	2	3	4	5	6	7
24. When I hear people talking privately, I avoid listening.	1	2	3	4	5	6	7
25. I always declare everything at customs.	1	2	3	4	5	6	7
26. I have never dropped litter on the street.	1	2	3	4	5	6	7
27. I never read sexy books or magazines.	1	2	3	4	5	6	7
28. I never take things that don't belong to me.	1	2	3	4	5	6	7
29. I have never damaged a library book or store merchandise without reporting it.	1	2	3	4	5	6	7
30. I don't gossip about other people's business.	1	2	3	4	5	6	7
31. I sometimes tell lies if I have to.	1	2	3	4	5	6	7
32. There have been occasions when I have taken advantage of someone.	1	2	3	4	5	6	7
33. I sometimes try to get even rather than forgive and forget.	1	2	3	4	5	6	7
34. I have said something bad about a friend behind his or her back.	1	2	3	4	5	6	7

Psychosocial Adjustment Following AMI

105

	Not at all					Very Much	
35. I have received too much change from a salesperson without telling him or her.	1	2	3	4	5	6	7
36. When I was young I sometimes stole things.	1	2	3	4	5	6	7
37. I sometimes drive faster than the speed limit.	1	2	3	4	5	6	7
38. I have done things that I don't tell other people about.	1	2	3	4	5	6	7
39. I have taken sick-leave from work or school even though I wasn't really sick.	1	2	3	4	5	6	7
40. I have some pretty awful habits.	1	2	3	4	5	6	7

Appendix I: Brief Symptom Inventory

Below is a list of problems and complaints that people sometimes have. Please read each one carefully. After you have done so, please circle the number to the right that best describes HOW MUCH DISCOMFORT THAT PROBLEM HAS CAUSED YOU DURING THE PAST WEEK INCLUDING TODAY. Circle only one number for each problem and do not skip any items.

HOW MUCH WERE YOU DISTRESSED BY:

	Not At All	A Little Bit	Moderately	Quite A Bit	Extremely
1. Nervousness or shakiness inside	0	1	2	3	4
2. Faintness or dizziness	0	1	2	3	4
3. The idea that someone else can control your thoughts	0	1	2	3	4
4. Feeling others are to blame for most of your troubles	0	1	2	3	4
5. Trouble remembering things	0	1	2	3	4
6. Feeling easily annoyed or irritated	0	1	2	3	4
7. Pains in heart or chest	0	1	2	3	4
8. Feeling afraid in open spaces	0	1	2	3	4
9. Thoughts of ending your life	0	1	2	3	4
10. Feeling that most people cannot be trusted	0	1	2	3	4
11. Poor appetite	0	1	2	3	4
12. Suddenly scared for no reason	0	1	2	3	4
13. Temper outbursts that you could not control	0	1	2	3	4
14. Feeling lonely even when you are with people	0	1	2	3	4
15. Feeling blocked in getting things done	0	1	2	3	4
16. Feeling lonely	0	1	2	3	4
17. Feeling blue	0	1	2	3	4
18. Feeling no interest in things	0	1	2	3	4

Psychosocial Adjustment Following AMI

107

	Not At All	A Little Bit	Moderately	Quite A Bit	Extremely
19. Feeling fearful	0	1	2	3	4
20. Your feelings being easily hurt	0	1	2	3	4
21. Feeling that people are unfriendly or dislike you	0	1	2	3	4
22. Feeling inferior to others	0	1	2	3	4
23. Nausea or upset stomach	0	1	2	3	4
24. Feeling that you are watched or talked about by others	0	1	2	3	4
25. Trouble falling asleep	0	1	2	3	4
26. Having to check and double check what you do	0	1	2	3	4
27. Difficulty making decisions	0	1	2	3	4
28. Feeling afraid to travel on buses, subways, or trains	0	1	2	3	4
29. Trouble getting your breath	0	1	2	3	4
30. Hot or cold spells	0	1	2	3	4
31. Having to avoid certain things, places, or activities because they frighten you	0	1	2	3	4
32. Your mind going blank	0	1	2	3	4
33. Numbness or tingling in parts of your body	0	1	2	3	4
34. The idea that you should be punished for your sins	0	1	2	3	4
35. Feeling hopeless about the future	0	1	2	3	4
36. Trouble concentrating	0	1	2	3	4
37. Feeling weak in parts of your body	0	1	2	3	4
38. Feeling tense or keyed up	0	1	2	3	4
39. Thoughts of death or dying	0	1	2	3	4
40. Having urges to beat, injure, or harm someone	0	1	2	3	4

Psychosocial Adjustment Following AMI

108

	Not At All	A Little Bit	Moderately	Quite A Bit	Extremely
41. Having urges to break or smash things	0	1	2	3	4
42. Feeling very self-conscious with others	0	1	2	3	4
43. Feeling uneasy in crowds	0	1	2	3	4
44. Never feeling close to another person	0	1	2	3	4
45. Spells of terror or panic	0	1	2	3	4
46. Getting into frequent arguments	0	1	2	3	4
47. Feeling nervous when you are left alone	0	1	2	3	4
48. Others not giving you proper credit for your achievements	0	1	2	3	4
49. Feeling so restless you couldn't sit still	0	1	2	3	4
50. Feelings of worthlessness	0	1	2	3	4
51. Feeling that people will take advantage of you if you let them	0	1	2	3	4
52. Feelings of guilt	0	1	2	3	4
53. The idea that something is wrong with your mind	0	1	2	3	4

Appendix J: Miller Social Intimacy Scale

For each question below, please think of someone special in your life (e.g., spouse, partner, close friend). Answer each question in relation to that special person. For each question circle the number that best describes how you feel.

- | | Very
Rarely | Some of the
Time | Almost
Always |
|--|----------------------|---------------------|------------------|
| 1. When you have leisure time how often do you choose to spend it with him/her alone? | 1 2 3 4 5 6 7 8 9 10 | | |
| 2. How often do you keep very personal information to yourself and do not share it with him/her? | 1 2 3 4 5 6 7 8 9 10 | | |
| 3. How often do you show him/her affection? | 1 2 3 4 5 6 7 8 9 10 | | |
| 4. How often do you confide very personal information to him/her? | 1 2 3 4 5 6 7 8 9 10 | | |
| 5. How often are you able to understand his/her feelings? | 1 2 3 4 5 6 7 8 9 10 | | |
| 6. How often do you feel close to him/her? | 1 2 3 4 5 6 7 8 9 10 | | |
| | Not
Much | A
Little | A Great
Deal |
| 7. How much do you like to spend time alone with him/her? | 1 2 3 4 5 6 7 8 9 10 | | |
| 8. How much do you feel like being encouraging and supportive to him/her when he/she is unhappy? | 1 2 3 4 5 6 7 8 9 10 | | |
| 9. How close do you feel to him/her most of the time? | 1 2 3 4 5 6 7 8 9 10 | | |
| 10. How important is it to you to listen to his/her very personal disclosures? | 1 2 3 4 5 6 7 8 9 10 | | |
| 11. How satisfying is your relationship with him/her? | 1 2 3 4 5 6 7 8 9 10 | | |
| 12. How affectionate do you feel towards him/her? | 1 2 3 4 5 6 7 8 9 10 | | |
| 13. How important is it to you that he/she understands your feelings? | 1 2 3 4 5 6 7 8 9 10 | | |

Psychosocial Adjustment Following AMI

110

	Not Much		A Little		A Great Deal					
14. How much damage is caused by a typical disagreement in your relationship?	1	2	3	4	5	6	7	8	9	10
15. How important is it to you that he/she be encouraging and supportive to you when you are unhappy?	1	2	3	4	5	6	7	8	9	10
16. How important is it to you that he/she show you affection?	1	2	3	4	5	6	7	8	9	10
17. How important is your relationship with him/her in your life?	1	2	3	4	5	6	7	8	9	10

Appendix K: Letter to Patients (Time 2 Questionnaire Package)

[OGH Letterhead]

Dear _____

As you may recall, the Health Psychology Division of the Department of Psychology at the Ottawa General Hospital is conducting a research project looking at coping and adjustment following a heart attack. The information obtained from this study will help us plan new and improved programs for cardiac patients, such as yourself. Your participation in this study, therefore, is very much appreciated.

You will find a copy of the assessment package for cardiac patients, as well as a self-addressed, stamped envelope, enclosed. Please try to complete this package as close to [insert date equal to two months from completion of the previous package] as possible, and be sure to answer every question. I will call you on [insert the date approximately two weeks from the day this package is sent] to see if you have completed the package. If you have any questions, I will be happy to answer them at that time. If you need assistance before this time, I can be reached at (613) 737-8927.

Thank you, once again, for your participation in this research project.

Sincerely,

Joan Kuhn, M.A. (In Progress)
Research Assistant
Department of Psychology, OGH

Dr. Robert P. Nolan, Psychologist
Coordinator, Health Psychology
Department of Psychology, OGH

Appendix L: Patient Debriefing (Time 2)

I would like to thank you on behalf of the Health Psychology Section of the Department of Psychology at the Ottawa General Hospital for taking part in this research study on how patients adjust their lifestyle following a heart attack. We have been studying whether readiness for changing smoking behaviour is related to a particular pattern of psychosocial adjustment following a heart attack. Results from this study are expected to enable health care professionals to identify potential risks (i.e. depression, problems with social supports, distress, etc.) for patients suffering from a heart attack, and identify areas that may require therapeutic intervention. If you have any questions I would be happy to answer them for you at this time. If you would be interested in the findings from the study, I would be happy to share them with you once all the data has been collected and analyzed (if the patient is interested I would make a note to send him/her a summary of the results at the end of the study).

**Appendix M: Post-Hoc Comparisons of
Defensive Responding and Depressive Symptomatology
Using the Behrens-Fisher Procedure**

General Formula:

Critical differences were calculated for each pair of means using these formulas:

$$W_r = X_i - X_j = q_{0.05}(r, df) \sqrt{\frac{\frac{s_i^2}{n_i} + \frac{s_j^2}{n_j}}{2}}$$

$$df' = \frac{\left(\frac{s_i^2}{n_i} + \frac{s_j^2}{n_j}\right)^2}{\frac{\left(\frac{s_i^2}{n_i}\right)^2}{n_i - 1} + \frac{\left(\frac{s_j^2}{n_j}\right)^2}{n_j - 1}}$$

Defensive Responding:

- 1) Smokers: $M = 87.15, SD = 11.34$
- 2) Ex-smokers: $M = 88.00, SD = 11.64$
- 3) Non-smokers: $M = 97.83, SD = 13.81$

Critical difference between group 1 and 2 = 8.99; observed difference = 0.85, n.s.

Critical difference between group 1 and 3 = 12.85, observed difference = 10.68, n.s.

Critical difference between group 2 and 3 = 10.36, observed difference = 9.83, n.s.

Depressive Symptomatology:

- 1) Smokers: $M_{adj} = 0.32, SD = 0.40$
- 2) Ex-smokers: $M_{adj} = 0.48, SD = 0.52$
- 3) Non-smokers: $M_{adj} = 0.85, SD = 0.63$

Critical difference between group 1 and 2 = 0.32; observed difference = 0.16, n.s.

Critical difference between group 1 and 3 = 0.43, observed difference = 0.53, $p < .05$.

Critical difference between group 2 and 3 = 0.38, observed difference = 0.37, n.s.

**Appendix N: Summary of Additional Hypotheses Regarding
Social Desirability**

Table 14

One-Way ANOVA for Impression Management

Source	df	<i>F</i>
		IM
Smoking Status	2	8.20
error	37	(194.50)

Note. Values enclosed in parentheses represent mean square errors.

Table 15

One-Way ANOVA for Total BIDR Score

Source	df	<i>F</i>
		Total BIDR
Smoking Status	2	8.17
error	37	(454.64)

Note. Values enclosed in parentheses represent mean square errors.

Table 16

Means and Standard Deviations for Impression Management and Total BiDR Scores

	IM <i>M (SD)</i>	Total BiDR <i>M (SD)</i>
Smokers	81.15 ^b (7.21)	168.31 ^d (15.35)
Ex-Smokers	82.00 ^a (15.10)	170.00 ^c (22.14)
Non-Smokers	101.08 ^{a, b} (17.53)	198.92 ^{c, d} (25.46)

Note. Entries having the same superscripts differ significantly at $p < .005$.

END

1 7 10 6-9 7

FIN