DEPRESSION IN A SAMPLE OF CANADIAN DENTISTS

by

D. Andrew Jones

A thesis
presented to the University of Manitoba
in fulfillment of the
thesis requirement for the degree of
DOCTOR OF PHILOSOPHY
in
Psychology

Winnipeg, Manitoba

ISBN 0-315-92220-6

Canada

Name _____

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.

SUBJECT TERM

0622 U·M·I

SUBJECT CODE

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 0680
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
- General 0679
- Ancient 0289
- Linguistics 0290
- Modern 0291

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

PHILOSOPHY, RELIGION AND THEOLOGY

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

Theology 0469

SOCIAL SCIENCES

American Studies 0323
Anthropology
- Archaeology 0324
- Cultural 0326
- Physical 0327

Business Administration
- General 0310
- Accounting 0272
- Banking 0770
- Management 0454
- Marketing 0338

Canadian Studies 0385
Economics
- General 0501
- Agricultural 0503
- Commerce-Business 0505
- Finance 0508
- History 0509
- Labor 0510
- Theory 0511

Folklore 0358
Geography 0366
Gerontology 0351
History
- General 0578
- 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
- General 0615
- International Law and Relations 0616
- Public Administration 0617

Recreation 0814
Social Work 0452
Sociology
- General 0626
- Criminology and Penology 0627
- Demography 0938
- Ethnic and Racial Studies 0631
- Individual and Family Studies 0628
- Industrial and Labor Relations 0629
- Public and Social Welfare 0630
- Social Structure and Development 0700
- Theory and Methods 0344

Transportation 0709
Urban and Regional Planning 0999
Women's Studies 0453

THE SCIENCES AND ENGINEERING

BIOLOGICAL SCIENCES

Agriculture
- General 0473
- Agronomy 0285
- Animal Culture and Nutrition 0475
- Animal Pathology 0476
- Food Science and Technology 0359
- Forestry and Wildlife 0478
- Plant Culture 0479
- Plant Pathology 0480
- Plant Physiology 0817
- Range Management 0777
- Wood Technology 0746

Biology
- General 0306
- Anatomy 0287
- Biostatistics 0308
- Botany 0309
- Cell 0379
- Ecology 0329
- Entomology 0353
- Genetics 0369
- Limnology 0793
- Microbiology 0410
- Molecular 0307
- Neuroscience 0317
- Oceanography 0416
- Physiology 0433
- Radiation 0821
- Veterinary Science 0778
- Zoology 0472

Biophysics
- General 0786
- Medical 0760

EARTH SCIENCES

Biogeochemistry 0425
Geochemistry 0996
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
- General 0566
- Audiology 0300
- Chemotherapy 0992
- Dentistry 0567
- Education 0350
- Hospital Management 0769
- Human Development 0758
- Immunology 0982
- Medicine and Surgery 0564
- Mental Health 0347
- Nursing 0569
- Nutrition 0570
- Obstetrics and Gynecology 0380
- Occupational Health and Therapy 0354
- Ophthalmology 0381
- Pathology 0571
- Pharmacology 0419
- Pharmacy 0572
- Physical Therapy 0382
- Public Health 0573
- Radiology 0574
- Recreation 0575
- Speech Pathology 0460
- Toxicology 0383

Home Economics 0386

PHYSICAL SCIENCES

Pure Sciences

Chemistry
- General 0485
- Agricultural 0749
- Analytical 0486
- Biochemistry 0487
- Inorganic 0488
- Nuclear 0738
- Organic 0490
- Pharmaceutical 0491
- Physical 0494
- Polymer 0495
- Radiation 0754

Mathematics 0405
Physics
- General 0605
- Acoustics 0986
- Astronomy and Astrophysics 0606
- Atmospheric Science 0608
- Atomic 0748
- Electronics and Electricity 0607
- Elementary Particles and High Energy 0798
- Fluid and Plasma 0759
- Molecular 0609
- Nuclear 0610
- Optics 0752
- Radiation 0756
- Solid State 0611

Statistics 0463

Applied Sciences

Applied Mechanics 0346
Computer Science 0984
Engineering
- General 0537
- Aerospace 0538
- Agricultural 0539
- Automotive 0540
- Biomedical 0541
- Chemical 0542
- Civil 0543
- Electronics and Electrical 0544
- Heat and Thermodynamics 0348
- Hydraulic 0545
- Industrial 0546
- Marine 0547
- Materials Science 0794
- Mechanical 0548
- Metallurgy 0743
- Mining 0551
- Nuclear 0552
- Packaging 0549
- Petroleum 0765
- Sanitary and Municipal 0554
- System Science 0790

Geotechnology 0428
Operations Research 0796
Plastics Technology 0795
Textile Technology 0994

PSYCHOLOGY

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

DEPRESSION IN A SAMPLE OF CANADIAN DENTISTS

BY

D. ANDREW JONES

A Thesis submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

ABSTRACT

Research suggests that dentists suffer from a disproportionate amount of job stress when compared to other health care professionals (e.g., Blachly, Osterud & Josslin, 1963; Labovitz & Hagedorn, 1971; Lang- Runtz, 1984;). According to the literature, this stress is associated with a high incidence of divorce, alcoholism, drug abuse, suicide, and depression (e.g., Forrest, 1978; Owen, 1982; Sword, 1977). Little empirical evidence actually exists, however, to support these claims (Ayer & Moretti, 1985; Hark, 1983). The present study examined the prevalence of depressive symptoms in a sample of Canadian dentists and then compared it to known prevalence rates of depression in the general population. As well, the study examined several factors that may be possible correlates of depression for dentists as postulated by a theoretical model that was developed from a model of depression first suggested by Lewinsohn, Hoberman, Teri, and Hautzinger, (1985). The model consisted of several hypothesized relationships between different sets of variables (job related, non-job related, personality characteristics, demographic variables and cognitive variables), with depression serving as the dependent variable. A self-administered mail survey was sent to all practicing dentists in the Province of Manitoba, a group totaling five hundred and twelve members. The final sample consisted of three hundred and six respondents, which represents a sixty percent return rate. Hierarchical regression analyses were used to analyze the data, and it was found that overall, the results support the proposed model. As predicted, one of the cognitive variables, (low self-esteem) was the strongest predictor of depression. As well, a high frequency of unpleasant events, a low frequency of pleasant events, gender, and a lack of social support were also significant predictors of depression for the dentists. One aspect of the dentists personality, namely their emotionality, was also significantly related to depression. Contrary to expectation, however, none of the job related factors (e.g., job satisfaction) were directly associated with depression. The comparison of prevalence rates revealed that the male dentists were significantly more depressed than a "high SES" group of males from the general population. Possible explanations for this important finding are examined. Furthermore, conceptual and measurement problems associated with the study are discussed. The present

findings suggest that depression is a significant problem within the dental community and that prevention and treatment of depression, as well as further research, should be a focus of dental organizations.

ACKNOWLEDGMENTS

First, I would like to thank my advisor, Gordon Barnes whose research knowledge, interest in doing a study "a little bit different" and gentle encouragement over the last few years allowed me to complete this project and my graduate career. I am also grateful to the members of my thesis committee who provided constructive comments about my research as it progressed through the various stages of it's completion. I would like to thank my colleagues at the Grace Hospital, for their encouragement and feedback on the thesis when requested. I gratefully acknowledge the financial contribution of the Manitoba Mental Health Research Foundation toward the operational costs of the project. As well, I wish to thank Llwellyn Armstrong from the Statistical Advisory Service whose statistical expertise aided me with the data analysis and helped me better understand the complex world of statistics. I also wish to thank my friends Trevor Markestyn and David Patton and Tim Aubry who have helped me "keep on track" with my thesis and let me vent my frustrations about the "Ph.D. trap" when needed. I also wish to acknowledge the encouragement of another friend, Shannon Hamm, whose memory is a constant reminder to me that life is short and that we should try and enjoy the little things that it has to offer. Thanks also to the Manitoba Dental Association who supported me with this research and of course, to the dentists themselves who took the time to fill out a rather long questionnaire. I am extremely grateful to my parents who supported my decision to enter graduate school and encouraged me throughout my life to do the best I can. Finally, I am most thankful to my wife, Gayle, who has sacrificed much and competed with " this thing" for many years, but has always supported me and believed in my abilities when I began to doubt myself. Special thanks also to my beautiful daughters, Holly, and Leah, who have helped me understand what is really important in life.

TABLE OF CONTENTS

Page

LIST OF APPENDICES

Appendix

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

The study of depression in various occupational groups has, for the most part, been encompassed by the psychological construct of burnout in the past few decades. While some researchers have listed depression as a symptom of burnout (Freudenberger, 1974), as the final state of burnout (Weiskopf, 1980), or as a synonym for burnout (Ficklin, 1983), others are now beginning to question the validity of this construct (Meier, 1984). Concern has arisen from the fact that the majority of evidence supporting the burnout construct has been largely anecdotal in nature (Meier, 1984). Similarly, while there is a common belief that members of certain professions (i.e., doctors, dentists, lawyers) are more likely to demonstrate symptoms of burnout and/or depression when compared to other professions (Lang-Runtz, 1984), there is little empirical evidence to support this claim (Bedeian, 1982).

The purpose of this study was to empirically determine the prevalence of symptoms of depression in a sample of Canadian dentists. As well, in order to determine if the symptoms of depression in this group exceeds the prevalence of these symptoms in the general population, comparisons were made with a general population sample from the City of Winnipeg (Barnes, Currie, & Segall, 1988).

In addition to empirically determining the prevalence of depressive symptoms in the sample, the study also examined factors that may be correlates or possible causes of depression in dentists. This was accomplished using a model of depression that was developed from a model first proposed by Lewinsohn, Hoberman, Teri and Hautzinger (1985).

Burnout and Stress

Ever since Hans Selye (1950) borrowed the term "stress" from physics to describe the body's psychological or physiological response to environmental events, a great deal of research has been conducted on this topic. One aspect which has received particular attention over the past decades is the area of occupational stress and its consequential impact on society. It has been estimated that health care costs associated with stress alone exceed $75 billion annually in the United States (Ivancevich &

Matteson, 1980). In addition, as many as 100,000 deaths occur annually in the United States as either a direct or indirect result of occupational stress (Ashford, 1977). Furthermore, a study by the United States Public Health Service Centers for Disease Control (1980) concluded that the primary reason for the 10 leading causes of death was not factors related to health care facilities or biological predisposition, but life-style. This finding implies that life-style can be modified in order to decrease the probability of death. As Hendrix, Ovalle, and Troxler (1985) note, however, knowing how to modify life-style effectively has been hampered by a lack of research designed to test the hypothesized relationships between factors proposed to cause stress and the resulting physiological and psychological consequences.

Interest in occupational stress rose dramatically with the introduction of the term "burnout" in 1974 (Freudenberger). Burnout has been the subject of numerous books (e.g., Edelwich & Brodsky, 1980), professional articles (e.g., Maslach, 1978), and various magazine and newspaper reports (e.g., Langcope, 1982). The treatment of burnout has been documented in no less than 25 different professions (Silverstein, 1982) including; police officers, teachers, child-care workers, nurses, psychologists, etc. However, the methods of examining burnout have often been descriptive reports that lack substantial empirical support and precise theoretical foundations (Meier, 1983). The result of this lack of empirical research, as mentioned earlier, was some serious concerns about the validity of the burnout construct.

Criticisms of the burnout literature have focused on the range of definitions, proposed causes, and assumed effects associated with the burnout phenomenon. For example, causes of burnout that have been advanced range from tedium and stress (Pines, Aronson, & Kafry, 1981) poor economic conditions (Crase, 1980), and career development crises (Cardinell, 1981) to work overload and lack of perceived success (Weiskopf, 1980). Definitions proposed by various researchers include; emotional exhaustion resulting from chronic tension and stress in people-helping work (Maslach & Jackson, 1981) and a state of tension or energy depletion produced by continuing frustration of personal needs on the job (Sassali, 1979).

This multitude of definitions, causes, and consequences of burnout has resulted in confusion about the separateness of burnout from other, related constructs. For example, Ficklin (1983) suggests that burnout has been confounded with "dissatisfaction, tedium, stress, morale, anxiety, tension, conflict, pressure,

boredom, fatigue, strain, and depression" (p. 578). Pines et al. (1981) indicate that burnout is a "social" phenomenon as opposed to a "clinical" one like depression. Others (e.g., Freudenberger, 1974; Wieskopf, 1980), describe depression as a symptom, or final state of burnout and ascribe symptoms such as insomnia, fatigue, and lack of interest in activities to burnout rather than depression (Meier, 1984). Thus, if the correlation between burnout and other constructs such as depression or job satisfaction is too high, then the belief that burnout is a unique, viable, construct may be false.

Meier (1984), tested the validity of the burnout construct using a mail-out questionnaire and a sample of 528 university faculty members from an American Midwestern university. He used two burnout measures (i.e., Maslach Burnout Inventory, Meier Burnout Assessment) and two depression inventories (i.e., Costello-Comrey Depression Scale, Minnesota Multiphasic Personality Inventory Depression Scale) in order to assess both the convergent validity and discriminant validity of the construct. Results suggest that there was strong support for the convergent validity of burnout, as burnout measures correlated highly and significantly with each other. Measures of burnout also correlated highly with depression, however, thereby weakening support for burnout's discriminant validity.

Meier (1984) suggests that one reason why burnout is so highly correlated with depression is that many psychological states are primarily experienced by individuals as feelings. As Zajonc (1980) has suggested, feelings are global, holistic, and difficult to express in words. Thus, when people experience depression or burnout they feel "bad" but are unable to discriminate their feelings further. Meier (1984) concludes that at its best "burnout" is a very "fuzzy" word. Furthermore, constructs like burnout and depression may be fuzzy precisely because they deal with feeling states and thus are relatively immune to precise definition.

It would appear, therefore, that what many researchers have termed burnout may, in fact, be depression. Despite what it is called, however, it clearly is a phenomenon which plagues modern society.

Over the past few decades attention has focused on the effect of stress amongst the so-called "helping professions". Research suggests that among all the helping professions doctors, lawyers, and dentists are the top three groups most affected by stress and suicide (Blachly, Osterud & Josslin, 1963). Furthermore, these authors suggest that dentists are more likely than any other professionals to choose suicide as a

means of dealing with their perceived stress, a finding supported by Labovitz and Hagedorn (1971). Similarly, Rose and Rosow (1973), in a study of suicide among physicians and health care workers, indicate that dentists commit suicide at twice the rate of the general population. Maris (1981), also examined suicide in the helping professions and found that dentists have a higher than average rate of suicide. Not all researchers, however, agree with these claims. In a review of the literature on suicide and occupation, Bedeian (1982), suggests that many of the studies mentioned above suffer from methodological shortcomings. For example, Blachly et al.'s (1963) study does not include statistical significance levels, is based on only a few cases from one state (Oregon), and makes no attempt to standardize their results for age or sex. Specifically in terms of dentists, Blachly et al. (1963), report an average suicide rate of 62.03 per 100,000 deaths. This rate was calculated on only 9 cases over 12 years, however, so its true significance and generalizability is questionable.

A similar study was conducted in California by Rose and Rosow (1973). Over the 3 year period covered by this study, 20 suicides were recorded for an annual rate of 83 per 100,000 deaths. As Bedeian (1982) points out, however, California is far from typical in terms of suicide and consistently ranks among the three states (after Nevada and Alaska) with the highest suicide rates (Frederick, 1978) in the United States. Thus, the generalizability of these values to the nation as a whole must be viewed with suspicion.

The most recent and comprehensive study of the cases of death among dentists was conducted by Orner and Mumma in 1976. The objective of the study was to investigate longitudinally mortality among U.S. dentists and compare it with that of the general, white male population. The study is considered quite methodologically sound (Bedeian, 1982) due to its attempt to ascertain all deaths of dentists in the United States between 1960 and 1965. This was accomplished by checking with all state dental associations and licensing agencies and searching post office correction lists. All data obtained were standardized for age, sex, and race. It was found that dentists commit suicide at a rate comparable to that of the general, white, male population.

In summary, it does not appear that suicide among dentists is any more common than it is for any other professional group. As Hark (1983) indicates," there is not a single carefully controlled study, using

a large sample as well as valid measures, that would demonstrate that dentists kill themselves with any more frequency than any other professional population."

Besides the controversial suicide rates among dentists, it has also been suggested that dentistry is far more stressful than other professions and that dentists suffer from a high incidence of divorce, alcoholism, and drug abuse (Owen, 1982). These findings have been acknowledged in other papers as well (e.g., Forrest, 1978; Sword, 1977; Lang-Runtz, 1984). Some authors dispute these findings, however, (e.g., Hark, 1983; Ayer & Moretti, 1985) and have even gone so far as to suggest that dental stress is a myth which has been perpetuated by specialists offering courses on stress management. The fact remains, however, that stress in dentistry is a frequently discussed topic in the dental literature as evidenced by the numerous articles published on the subject (e.g., Cooper, 1980; Cooper, Watts, Baglioni Jr, & Kelly, 1988; Katz, 1982; Litchfield, 1989; O'shea, Coroh & Ayer, 1984).

The difficulty with these articles is that, for the most part, they are not based on empirical research. As Gift (1977) notes, such articles "indulge in vague references and facts that are not cited and employ hearsay, secondary and tertiary sources for citation rather than primary sources" (p. 37). Furthermore, studies of dental stress which are of a more empirical nature present their findings in basically a descriptive fashion with no comparisons to the general population.

For example, Dunlap and Stewart (1982) conducted a "Work-Stress Survey" of 3,700 dentists and 1,800 dental auxiliaries. The author's assessed three areas of work stress including; stress symptoms, stress sources and stress management skills. The results of the study indicate that 38% of dentists always or frequently feel worried or anxious. Dentists identified perfectionism (64%) as their most frequent source of stress and endorsed their lack of exercise (56%) as their least effective stress management skill. Despite these important findings, no comparisons were made to other professional groups or to the general population in order to see if these results are excessively high or not.

Wilson (1984) conducted a similar national survey of 1,017 dentists in the United States. The focus of this survey was to address some of the concerns mentioned earlier about dentists: namely, do they have a high divorce rate, and abuse alcohol and drugs? Results indicate that less than 5% of the dentists sampled were currently divorced and fewer than 2% were currently separated from their spouse. Only 1.1% used

marijuana frequently and only 0.1% reported frequent use of cocaine. In terms of alcohol consumption, most dentists (39%) indicated they drink less than one drink per day or only on rare occasions, while 4.4% of the respondents reported drinking habits approaching a problem level (3 or more drinks per day). As with the Dunlap and Stewart (1982) survey, however, this was the extent of the analysis of the survey results. While indeed interesting, the results do nothing to further the knowledge as to whether dentists are more stressed than other professionals or the general population. Nor do they provide conclusive evidence that the other anecdotal reports are incorrect in their assumptions.

Probably the area where the dental literature has been most effective and consistent in terms of understanding dental stress is in identifying various stress factors. Basically, three major stressor groups have been identified, which include; 1) job related factors, 2) external or non-job related factors, and 3) individual or personal characteristics (Hendrix, 1986).

Job-Related Factors

Overall, job-related stress factors in dentistry appear to have more of a psychological basis than a physiological one. However, some researchers have identified stressors of a physiological nature. Joos (1975) and Harris, Nicols, Stark and Hill (1978) for example, suggest that mercury poisoning may be responsible for some of the problems dentists exhibit. These author's argue that dentists are frequent users of mercury and that prolonged exposure to mercury vapors can cause symptoms of depression, irritability and insomnia. These results, however, remain inconclusive and have in fact been challenged in the literature (Wilson & Wilson, 1982). Similarly, it has been found that long term exposure to anesthetic gases such as nitrous oxide can cause problems such as miscarriages, birth defects, liver disease, and neurological problems in both dentists and their assistants (Owen, 1982).

Another frequently discussed physiological stressor relates to the physical constraints of working within a confined area and in a relatively fixed posture (Schmidt & Neidhardt, 1985). Such a posture creates a high incidence of back and musculoskeletal problems including slipped disks, impaired circulation, foot problems, varicose veins, and curvature of the spine (Owen, 1982).

Possible irradiation from x-rays and hearing impairment caused by high speed dental drills are also possible physiological stressors (Litchfield, 1989). Increasing concern about the possible transmission of infectious diseases (e.g., hepatitis, AIDS) is another source of stress encountered by dentists (Litchfield, 1989).

In terms of more psychologically oriented job-related stressors, several have been identified in the literature. Perhaps the most prominent relates to doctor-patient relations. In Wilson's (1984) survey, dentists ranked unappreciative patients as the leading source of stress. Rankin and Harris (1989) also found that uncooperative patients cause dentists a great deal of stress. Patients often demonstrate anxiety about going to the dentist (Cousins, 1975) and the general perception in society is that people "hate" dentists. A study in Great Britain (Green & Green, 1968) indicated that 50% of adults visited dentists only when they had a problem. This constant feeling of rejection is frequently reinforced by patients who tell dentists "Doc, don't take this personally, but I hate dentists". Furthermore, in one of the rare studies where statistical analysis was actually used in examining stress in dentists (Cooper et al., 1988) it was found that "negative patient perceptions" was a consistent predictor of stress in both male and female dentists. Another doctor-patient issue is highlighted by Dunlap and Stewart (1982), who found that dentists ranked "sensing fear in patients" as a major source of stress. Anxieties also may pass back and forth between patient and dentist without the dentist being aware of it. DeFazio (1980), for example, found that the dentists' blood pressure increases prior to giving a patient an injection, particularly if the patient demonstrates a great deal of anxiety about receiving the injection. Wilson's (1982) respondents also reported that patient fears and inflicting pain were among the top 10 stressors experienced by dentists. A related stressor of doctor-patient relations involves the patient's expectations of the dentist. Many patients expect dentists to "undo" any problem with no pain or disruption to their daily routine (Wilson, 1984).

Other job-related stressors include time pressures, management difficulties, economic problems, isolation and what has been called a "status dilemma" problem (Hilliard-Lysen, & Reimer, 1988). Both Wilson's (1984) and Stewart and Dunlap's (1982) surveys as well as a study by Brand and Chalmers (1980) identified time pressures as a major stressor in dentistry. Dentists reported that staying on

schedule during the day was a continuing source of aggravation and, as Forrest (1978) indicates, some dentists see as many as 30 or more patients per day. In a Canadian study of stress in dentistry Howard, Cunningham, Rechnitzer and Goode (1976) found that 60% of the dentists in their sample indicated they were continually behind schedule.

In terms of management difficulties, dentists not only are clinicians, but also must coordinate the financial paperwork necessary to deal with patients and staff. This involves insurance forms, bills, wages, etc. Many dentists reported that they were poorly prepared for practice management when they graduated (Wilson, 1984).

Economic problems encompass not only the patient's perceptions of dental fees (i.e., "dentists are ripping people off") but also the increasing costs of entering dentistry and maintaining a practice (Litchfield, 1989). It has been estimated that when dentist's graduate they can easily expect a financial burden of over $100,000. This is based on the average dental school costs of $13,000 annually, excluding living expenses (Hilliard-Lysen, & Reimer, 1988). Establishing and equipping an office can cost an additional $100,000 (Owen, 1982). The dentists must then get patients, which they can do by obtaining a patient list from a retiring dentist for approximately $100,000 (Greene, 1984). All these costs must be absorbed within a declining income situation where it has been estimated that there will be increased competitive market pressures generated by increases in the number of dentists relative to the demand for increased dental services (Hixson, 1979).

An alternative to the high start up costs is to join an established office as an associate. However, dentists with growing practices are not usually willing to take on new associates (Greene, 1984). In fact, approximately 88% of dentists have a private practice versus 12% who choose to work in a group or institutional setting (Hilliard-Lysen, & Reimer, 1988). In a solo practice situation dentists find that "time is money". Faced with the need to earn every cent with their own hands, a reduced income as they get older, and a relatively short period of maximum income producing capacity, dentists have many economic worries (Litchfield, 1989). In conjunction with these self-employment concerns is the lack of sick pay and holiday pay. Many dentists literally feel they cannot afford to be sick (Forrest, 1978), nor do they make effective use of leisure time (Schmidt & Neidhardt, 1985).

Two other contributing factors to the economic stresses of dental practice are the increasing involvement of insurance companies, which effectively erodes the dentist's autonomy by requiring him or her to conform to insurers' standards of treatments and fees, and the increasing incidence of malpractice suits, which results in higher malpractice insurance premiums (Forrest, 1978).

A further consequence of solo practice is an increased sense of work isolation. Unlike other professional groups who can share experiences and relieve stress through peer reinforcement, dentists tend to be much more isolated (Forrest, 1978). This is further enhanced by the competition between dentists for patients which often precludes the development of close friendships with other dentists (Forrest, 1978). As well, it has been estimated that there are about 188 auxiliary workers (e.g., dental assistants, dental hygienists) for every 100 dentists and 750 medical auxiliary workers for every 100 doctors (Littleton, 1979). Thus, dentists even have fewer staff they can confide in as compared to other professionals. Similarly, conversation with patients tends to be limited due to the nature of the work, therefore increasing the sense of isolation even more (Forrest, 1978). Lack of social support from peers or others is a well documented precursor of stress and depression (e.g., House, 1981; Brown & Harris, 1978).

Finally, a dentist's "status dilemma" also appears to be a job-related stress factor (Hilliard-Lysen, & Reimer, 1988). Dentistry is a specialty in the field of medicine and, therefore, requires its participants to complete the same amount of education as a medical doctor. According to Owen (1982), however, there is a perception by many people that dentists were either unable to get into medical school or dropped out, choosing dentistry as a second profession. Thus, even though dentists are doctors, they are often considered "second class" doctors and are commonly referred to as "dentists" not "doctors" by the general public (Owen, 1982). This status differentiation is said to result in a "status dilemma" for dentists that adds to the job-related stressors that a dentist must face on a day to day basis (Hughes, 1981).

External Factors

The second group of stressors which have been noted to increase occupational stress in dentists are external or non-job related factors. This group of stressors includes factors such as excessive commuting

time and distance, economic factors such as high interest rates, and demands placed on an individual by community and social activities (Hendrix, 1986).

One of the most important external factors relates to family relationships. Poor family interaction has been linked as a strong predictor of life stress with a resulting significant effect on job stress (Hendrix, 1986). Dunlap and Stewart's (1982) survey compared stress levels reported by never married, married, and divorced respondents. Results indicate that the never married group was less stressed than the married group while the divorced group was the most stressed.

Nevin and Sampson (1986) conducted a study specifically examining the relationships between the stresses of family life and dental practice. Twenty-eight couples in the state of Indiana participated in the study. Results indicated that dental families did encounter a significant number of stressors arising from both the dental practice and the family. These stressors included finance and business strains, work-family strains, illness strains, losses/transitions in and out of the home and pregnancy/childbearing strains. Effects of the office related stressors were directly experienced in the family, particularly by the spouse. Strong coping patterns resulted when dentists and spouses maintained a balance of time and responsibility, regular communication, shared decision-making, good physical health, satisfaction in work and family activity, and the inclusion of an active exercise program.

Lack of physical exercise or other activities (e.g., community involvement) has also been identified as a non-job related stress factor for dentists (Hendrix, 1986). Sixty-one percent of dentists in the Nevin and Sampson (1986) study indicated that they get an inadequate level of exercise, while 56% of dentists reported a similar situation in the Dunlap and Stewart (1982) study.

Howard et al. (1976), examined the relationship of physical condition and stress by studying 33 dentists in Ontario. The author's determined the physical working capacity (PWC) of the subjects by having them ride a bicycle ergometer. The dentists also completed a questionnaire which included a checklist of 40 stress symptom items. The results showed that those individuals who did get a minimum amount of exercise had a higher PWC score and displayed a lower average number of stress symptoms. The authors suggest that exercise may be a method of helping dentists cope better with stress (Howard et al., 1976).

In an 11 year study of the health of dentists, Cureton (1961) reported that dentists are below average on most physical tests and the type of exercise they did was "trivial". In 1971, Campbell, Coilett, and Fary, studied 229 male Australian dentists. Of this group, 27% took part in no physical activity during the week while the remaining 73% had only one or less hours of activity per week. The types of activities dentists participate in have been studied by Borkman, Hickey, and Ayer (1981). These researchers found, from a survey of recreational and community activities of dentists, that respondents were strikingly more recreationally oriented than community oriented. Dentists preferred sports and physical activities over intellectual, cultural or artistic hobbies. In particular, the respondents preferred individual or partner sports over team sports. This preference for individual activities (e.g., golf, tennis, etc.) was also reported by Reeves and Reeves (1976), who found that dentists engage in recreational activities that extend or are similar in some way to what they do in their work. For example, they found that dentists do not participate in hiking or informal activities because they differ too much in role structure from the activities performed at work. Instead, dentists appear to favor more solitary, leisure activities which are highly structured and more complicated such as golf, etc., (Cooper & Christen, 1978). These results not only illustrate a dentist's frequency and type of preferred activities but are also indicative of certain personality characteristics.

Personality Characteristics

Personality or individual characteristics are the third group of major stressors which are often identified as antecedents of dentists' stress (e.g., Hendrix, 1986). Several authors (e.g., Forrest, 1978; Katz, 1986; Howard et al., 1976; Sword, 1977) have described the "typical" dentist as hardworking, ambitious, perfectionistic, dogmatic, authoritarian, Type A, having low self-esteem, and as being left hemisphere dominated. Several studies have provided support for these claims. Cooper (1980), surveyed a group of practicing dentists in California. He was interested in the relationship between certain job characteristics, personality variables and physiological indicators of "dentists at risk" from coronary heart disease. Cooper found that dentists who were relatively free from anxiety and emotionally stable showed

fewer signs and symptoms of cardiovascular disease. In a follow-up study with the same sample of dentists, Mallinger, Brousseau and Cooper (1982) examined the relationship between the same personality factors and several indices of career success and satisfaction. Results of this study suggested that satisfied and successful dentists were significantly higher in ego strength (vs. emotionally unstable), were well adjusted (vs. highly anxious), and venturesome (vs. timid). Results of the Dunlap and Stewart (1982) survey also support the "typical" dentist profile by finding that 64% of dentists were always or frequently concerned with perfection, which was the most common source of stress identified. Also, approximately one third of dentists responded that it was very important for them "to win at golf, tennis, or other sports". Furthermore, these dentists admitted that they were always or frequently "distressed when their decisions were questioned". These results are strongly indicative of a type A person who is typically competitive and authoritarian.

Several researchers have discussed the fact that the dental school selection process has unknowingly contributed to this problem (e.g., Forrest, 1978; Sword, 1977). Schools frequently select candidates with an obsessive-compulsive life style, which is perpetuated by the dental curriculum (Tisdelle, Hansen, Lawrence & Brown, 1984). This curriculum, which is considered one of the most harrowing and stressful in professional education (Malcolm, Ponce & Bardzinski, 1981), demands perfection from students while at the same time providing inconsistent and subjective feedback for clinical work (Tisdelle et al., 1984). This drive for perfection and unobtainable performance levels can easily lead to unmanageable stress (Owen, 1982). As Sebor (1984) points out, stress is not only inherent in dentistry it is also believed to be taught to dental students. This suggestion has been corroborated by a study by George, Whitworth, Sturdevant and Lundeen (1987), who found that a higher level of type A behavior was consistently associated with a higher stress level for dental students. Such characteristics probably interact with the demands of dental education to produce a more stressful interpersonal environment. These findings have been supported by other research with dental students as well (e.g., Grandy, Westerman, Combs and Turner, 1989; Sturdevant et al., 1987). To complicate the situation, dentists who are experiencing a great deal of stress but who possess these type A characteristics often have difficulty asking for help, according

to Dunlap and Stewart (1982). Professionals as a group often deny that problems exist within themselves and, by extension, in their colleagues (Forrest, 1978).

Perhaps the best study examining the contribution of situational and personality factors to the stress of dentists was conducted by Katz (1982). The author surveyed 300 randomly selected dentists across the state of Texas. Respondents completed several personality questionnaires designed to measure attitudes and beliefs about life in general and dentistry in particular. Respondents were also asked to rate the stressfulness of several situational factors (i.e., time pressure, inflicting pain, etc.) and to indicate their level of career satisfaction. Results of the study suggest that there was little relationship between the situational factors, and the amount of stress or level of career satisfaction. However, consistent and very significant relationships were found to exist between the personality characteristics of the dentists, the degree of stress experienced, and the level of career satisfaction. In particular, Katz found a strong relationship between what researchers (Kobasa, 1979) have labeled the "Hardy-type personality" and the measures of stress and career satisfaction. Hardy-type persons are those who have a high degree of control in their lives, have a strong commitment to the institutions and activities in their lives and enjoy challenge, which is defined as the anticipation of change as an exciting challenge to further their development. Dentists who scored low on these characteristics rated dentistry as quite stressful and tended to be less satisfied with dentistry as a career (Katz, 1982).

Besides these three identified categories of dental stress factors, dentistry, in an overall sense, has been viewed as very stressful. For example, Wilson (1984), found that the majority of her respondents viewed dental practice as quite stressful, a finding that is supported by Dunlap and Stewart (1982), and Cooper, Watts, and Kelly (1987). Furthermore, more than 30% of the total sample in Wilson's (1984) study indicated that they have seriously thought about leaving dentistry, while 48% of the dentists age 40 and over expressed a willingness to change careers if the opportunity arose.

In conclusion, it would appear, based on the available literature, that dentistry is indeed a stressful profession. Job-related factors, external factors, and individual characteristics are among the many factors which can and do play a role in the development of this stress. Once developed, the stress is experienced at both a physiological and psychological level.

Physiologically, stress causes a variety of responses. These include changes in total cholesterol, adrenaline, triglycerides, as well as other blood chemistry changes (Hendrix, 1986). In addition, pulse rate, blood pressure, and respiratory rate can be adversely affected by stress. Such changes may then lead to physical disease (Russek, 1962). For example, research indicates that elevated levels of total serum cholesterol are related to increased coronary heart disease (Uhl, Troxler, and Hickman, 1981). Also, an increase in adrenal hormone levels has been linked to suppression of the immune system which fights off cold and flu episodes (Ivancevich & Matteson, 1980). Immediate psychological reactions to stress include anxiety, depression, irritability, and a decrease in job satisfaction (Hendrix, Ovalle & Troxler, 1986). These immediate responses produce other behavioral consequences such as reduced performance, absenteeism, tardiness, and increased rates of job turnover (Hendrix, 1986). As well, other behavioral consequences emerge, such as alcohol and drug abuse in order to try and cope with the stress.

Given what is known about the various factors leading to stress in dentistry, its physiological and psychological responses, and its apparent consequences, one might assume that various models would exist examining these interactions. In fact, only two models (Hendrix, 1986; Howard et al., 1976) could be found in the dental literature. Moreover it was found that neither of the models has undergone any empirical testing. For the most part, authors of dental stress articles have been content to mention the alarming, yet empirically unsupported, reports of excessive alcoholism, divorce, and suicide and to discuss the factors which cause stress (e.g., Cooper et al., 1988). Some authors also discuss how to deal with stress by increasing exercise, engaging in hobbies, eating properly, and developing social networks, etc., (e.g., Christen, 1984).

Prevalence of Depression

As mentioned earlier, occupational stress is often discussed in conjunction with burnout in the stress literature (e.g., Meier, 1984, Freudenberger, 1974). This is also the case in the dental literature where burnout is viewed as a result of job related stress (e.g., Wycoff, 1984, Willey, 1987). Depression is a frequently cited result of dental stress (e.g., Hendrix, 1986; Dunlap & Stewart, 1982; Tisdelle et al., 1984;

Sword, 1977; Forrest, 1978) but, as mentioned earlier, studies indicate that depression should be considered a separate construct from burnout (Meier, 1984).

A review of the dental literature revealed only two articles which extensively discuss depression in dentists. An article by Sword (1977), describes the "depression-prone personality" in dentistry but refers to the suicide literature (also mentioned earlier) to support his claims. The second article by Shurtz, Mayhew and Cayton, (1986), discusses the definition, symptoms, and treatment approaches of depression. The authors also outline the three categories of stress factors (i.e., job related, external, and personality characteristics) related to dentistry and how these factors can lead to depression. Neither article, however, provides any information as to the prevalence of depression in dentists. In fact, with the exception of Dunlap and Stewart's (1982) article indicating that 20% of the responding dentists always or frequently feel depressed, there is virtually no literature on the prevalence of depressive symptoms in dentists.

Studies on the prevalence of depressive symptoms in the general population have produced varying results depending on the measurement technique employed. Barnes, Currie, and Segall (1988) indicate that when DSM-III criteria or Research Diagnostic Criteria (RDC) were employed in various studies (e.g., Murphy, 1980; Boyd & Weissman, 1981), the point prevalence of depression is estimated at around 4%. This concurs with earlier findings by Lehmann (1971), and Weissman and Myers (1978).

Estimates using the Present State Exam (PSE), appear to be higher, ranging from 8.5% in Calgary, Alberta (Costello, 1982), to 10.8% in Camberwell, England (Boyd & Weissman, 1981). Studies using self-report measures, such as the Center for Epidemiological Studies Depression (CES-D) scale, have produced higher, but still consistent prevalence rates ranging from 15% to 21% (e.g., Radloff, 1979; Amenson & Lewinsohn, 1981). Most of the studies using the CES-D have been carried out in the United States. Barnes et al. (1988), sought to overcome this situation by using the CES-D to determine the point prevalence of depression in a Canadian general population sample (in Winnipeg). Results of the study indicate that the prevalence of depression in this Canadian sample was very similar to that found in the American studies (17%).

Prevalence of Depression in the Medical Profession

Like in the dental profession, there has been growing concern about the high levels of stress associated with the practice of medicine. Several researchers (Butterfield, 1988; Scheiber, 1987) have pointed out the possible adverse effects of this work stress which, as for dentists, includes marital difficulties, substance abuse, depression, and suicide. One study by Hsu and Marshall (1987), examined the prevalence of depression in a sample of Canadian residents, interns, and fellows. A questionnaire was sent to 2,620 of these individuals in the province of Ontario. Responses were obtained from 1,805 subjects yielding a response rate of 69%. The CES-D (Radloff, 1977) was used to measure depressive symptoms and emotional distress in the sample. Results of the study showed that 23% of the subjects had some degree of depression. Similar findings were reported by Gallery et al., (1991) who surveyed 1,350 Emergency Physicians in the United States and received a 56.5% response rate. Results of this study found that 19.3% of the respondents had significant depressive symptomatology on the CES-D.

Theories of Depression

Several theories of depression have been developed which examine various psychosocial, behavioral, and cognitive factors believed to contribute to the etiology of adult depression. The most influential theoretical formulations and clinical approaches can be roughly divided into those that emphasize "reinforcement" and those that emphasize "cognitions" on the etiology of depression. Although these two conceptualizations differ fundamentally in where they place the locus of causation they do have important similarities. For example, both assume that the depressed individual has acquired maladaptive reaction patterns that can be unlearned. Similarly, the treatments in both are aimed at the modification of relatively specific behaviors and cognitions rather than a general reorganization of the individual's personality (Lewinsohn, & Hoberman, 1982).

Cognitive Theories

One theory which has greatly influenced contemporary thinking about depression is Beck's (1967, 1976) cognitive theory of depression. Beck's theory proposes that depression is caused by distorted thinking or unrealistic cognitive appraisals of life events. These negative cognitions form a "depressive triad," which consists of negative self-concept, negative interpretation of self experience and negative expectation of future life events. This triad is part of the cognitive schemata, which are fundamental cognitive structures that organize and process incoming information. Schemata develop early in life from personal experiences and identification with significant others. Schemata are usually latent but become activated and hypervalent when triggered by losses or stressful life events. Once activated these schemata lead to systematic distortion of the person's thoughts and perceptions. For example, Beck (1976) argues that depressed people are especially prone to engage in arbitrary inference (drawing conclusions without sufficient supporting evidence), selective abstraction (drawing conclusions based on one of many bits of information), overgeneralization (drawing sweeping, global, conclusions on the basis of single events), and magnification and minimization (exaggerating the significance of negative events and minimizing the significance of positive events). Thus, individuals who become depressed possess a stable, depressogenic cognitive style that predisposes them to depressive episodes (Beck & Weishaar, 1989).

In recent years, a considerable amount of experimental literature has accumulated relating to the variety of predictions implied by Beck's theory. While many studies (e.g., Beck, 1983; Kuiper, Derry, and MacDonald, 1982; Beck, Rush, Shaw & Emery, 1980) have supported Beck's theory, other studies (e.g., Lewinsohn, Mischel, Chaplin, & Barton, 1980a; Barnett & Gotlib, 1988) have questioned the basic tenets of the theory.

Another cognitive model of depression which has received considerable attention in the psychological literature is the learned helplessness model of depression. In the original model described by Seligman (1975), it was proposed that events which an organism attempts to control, but cannot, may have a number of disruptive effects. The resulting deficits fall into three categories motivational, cognitive and emotional. The motivational deficit is reflected in retarded initiation of voluntary responses; the cognitive

deficit involves erroneously pessimistic expectations of the non-contingency of future outcomes; and the emotional deficit presents as a depressed mood (Bebbington, 1985).

A number of inadequacies of this animal model arose, however, when applied to account for depression in humans (Blaney, 1977; Depue & Monroe, 1976). This led to a reformulation of the model by Abramson, Seligman, and Teasdale (1978). In this revised model the major innovation was the introduction of an attributional framework. The revised theory proposes that situations which cause an individual to feel uncontrollability lead to an expectation of helplessness that in turn leads to deficits (i.e., depression). Causal attributes about the uncontrollable events are important determinants of the generality of the induced deficits and of the involvement of the individual's self-esteem (Seligman & Peterson, 1986). Numerous studies with adult samples have provided support for the learned helplessness view (e.g., Golin, Sweeney, & Schafer, 1981; Seligman, Abramson, Semmel & von Baeyer, 1979) although the theory has its share of critics also (e.g., Bebbington, 1985; Lewinsohn & Hoberman, 1982).

An important feature of both Beck's (1967) theory and Abramson et al.'s (1978) theory is that they both describe a relatively stable, trait-like cognitive vulnerability or diathesis for depression. As well, they both specify a set of specific event-related cognitions that derive from that diathesis. The diathesis-stress nature of these models is the idea that dysfunctional attitudes and attributional styles increase the probability of depression only to the extent that they are activated by stressful life events (Robins and Block, 1989). Several studies have examined the relations of depression or depressive symptoms to the interaction between cognition and the frequency or intensity of stressful events. Results have consistently found a correlation between stressful life events, dysfunctional attitudes (e.g., Persons & Rao, 1985), a depressogenic attributional style (e.g., Robins & Block, 1988; Rothwell & Williams, 1983), and depression.

The relationship between cognitions, depression and stressful life events has also been examined in a third cognitive model of depression described by Brown and Harris in their book, Social Origins of Depression, published in 1978. On the basis of a survey of women in Camberwell, South London, Brown and Harris developed a complex account of the interaction of social factors in the precipitation of depression. The unifying idea underlying Brown and Harris's theory is the central experience of

hopelessness arrived at by the women's cognitive appraisal of adverse circumstances which usually take the form of "loss".

Three types of factors are believed to interact and cause depression. The first factors are called "provoking" factors, which are usually events that involve an important loss or disappointment. Such loss can encompass not only loss of a person (i.e., death or divorce) but also loss of a role or deprivation of value or reward (i.e., reinforcers). Such loss reflects an inability to hold good thoughts about oneself, one's life, or of those around oneself. Many of these loss ideas were developed from those of Bowlby (1971, 1973).

The chance that such provoking factors will result in depression is increased by the presence of a second group of factors called vulnerability factors. Brown and Harris (1978) identified four vulnerability factors in their study. These included early loss of mother, involvement in the care of young children, lack of an adequate confidant and the absence of employment.

The third factor in the model, symptom-formation, influences the depression once it occurs, in terms, for instance, of the degree to which the depression is "psychotic" or "neurotic". It is postulated that a person's early experiences, such as previous depressive episodes, influence this factor (Brown & Harris, 1978). Although there is some support for the theory (e.g., Martin, 1982; Brown, Harris & Bifulco, 1986), some authors have questioned the validity of the proposed interactional nature of the factors (e.g., Costello, 1982; Bebbington, 1985).

Reinforcement Theories

Reinforcement theories of depression contrast sharply with the cognitive approaches. They emphasize the reduced frequency of overall activity as the primary defining characteristic of depression (Pyszczynski & Greenberg, 1987).

Probably the most widely known reinforcement theory of depression was developed by Lewinsohn (1975). This theory has been responsible for generating a substantial amount of empirical research on the phenomenon of depression (e.g., Lewinsohn & Amenson, 1978; Lewinsohn & Talkington, 1979;

Lewinsohn, Youngren & Grosscup, 1980; Brown & Lewinsohn, 1982; Youngren & Lewinsohn, 1980). Lewinsohn (1975) has suggested that the feeling of dysphoria is the central phenomenon of depression. Cognitive symptoms (e.g., low self-esteem, feelings of guilt) are viewed as the depressives' efforts to explain to themselves and others why they feel bad (Lewinsohn & Hoberman, 1982). Lewinsohn's (1975) theory proposes that dysphoria is a direct result of a reduction in the rate of response contingent reinforcement and/or an increased rate of aversive experience. Thus, the relative presence or absence of reinforcing events is postulated as playing the major role in the development and maintenance of depression.

According to this theory, low rates of positive reinforcement and/or high rates of aversive experience in the person-environment interaction occur for three reasons. First, the positive reinforcement potency of events may be reduced (e.g., due to age) and/or the negative impact of punishing events may be heightened. Second, events that are reinforcing may become unavailable (e.g., due to injury) or the environment may have many punishing aspects. Third the person may lack the skills (i.e., social skills) to obtain available positive reinforcers and/or cope effectively with aversive events (Hoberman & Lewinsohn, 1985). Once an individual experiences a low rate of positive reinforcement and/or an increase in aversive events, he/she is likely to emit behaviors at a lower rate. This low rate of behavior makes positive reinforcement less likely and consequently instigates a cycle of reduced activity and increasingly infrequent reinforcement. This lower rate of activity may itself be reinforced, for example, when friends or family dispense sympathy, reduce responsibility or increase attention to the withdrawn individual. Reinforcement for inactivity increases the frequency of these behaviors (Pyszczynski & Greenberg, 1987). Support for this theory, as mentioned earlier, has been extensive (e.g., Grosscup & Lewinsohn, 1980; Lewinsohn & Amenson, 1978).

Despite the research supporting the various cognitive and reinforcement theories discussed so far, Lewinsohn, Hoberman, and Rosenbaum (1988) have indicated that most theories of depression have focused on "a single, global, central mechanism assumed to be the sole or primary cause of depression" (p. 252). They further suggest that two facts argue against such simple conceptualizations. First, the behavioral characteristics of depression are quite diverse and are manifested at an equally diverse number

of levels (e.g., cognitive, socioenvironmental, behavioral, psychobiological) and therefore, it is unlikely any single factor (such as cognitions) could account for all these different effects. Second, each of the causal agents hypothesized thus far can account for only a select proportion of the variance in depression. For these two reasons several researchers have advocated more integrative models of depression (e.g., Billings & Moos, 1982; Whybrow, Akiskal & Mckinney, 1984; Lewinsohn, Hoberman, Teri & Hautzinger, 1985) in contrast to the more simplistic "single sentence" theories of depression (Lewinsohn et al., 1988). Central to these theories is the belief that depression is a multidetermined phenomenon in which a number of antecedent conditions may be neither necessary nor sufficient but, rather, contributory in nature (Susser, 1973).

Of particular interest for this study was Lewinsohn et al.'s (1985) revised model of Lewinsohn's earlier (1975) theory of depression. As Lewinsohn et al. (1985) point out, this early reinforcement model of depression fell into the same unidimensional conceptualization of depression as the other cognitive models, which as discussed already, have proven to be of only limited usefulness in explaining all aspects of depression.

Lewinsohn et al.'s (1985) revised model strives to present a new theory of the etiology of depression that allows for a synthesis of a variety of factors found to be associated with depression. As Lewinsohn et al. (1985) note, the model is an integration of epidemiological findings and treatment outcome studies with an increasing body of knowledge about self-awareness (e.g., Carver & Scheier, 1981; Scheier, Carver & Gibbons, 1981). Depression is viewed as the end result of environmentally initiated changes in behavior, affect and cognitions. Following from previous behavioral theories of depression, environmental or situational factors are the primary triggers of the depressogenic process. Cognitions are viewed as moderators of the effects of the environment and determine if the situational conditions will result in depression.

Thus, like the theories of Beck (1967) and Abramson et al.(1978), Lewinsohn et al.'s (1985) model is a diathesis-stress model to the extent that cognitions are the critical factor in determining if stressful life events lead to the development of depressive symptoms. In particular, Lewinsohn et al. suggest that when attention is focused increasingly on the self versus the environment due to an individual's unsuccessful

efforts to cope with stressful life conditions, the preconditions for the development of depressive symptoms are set in motion.

Lewinsohn et al.'s (1985) model is particularly important for this study because many of its integrative components include variables which, as previously discussed, have been linked to the development of dental stress and depression. The development of depression, according to this model, is postulated to begin with the occurrence of an evoking event or antecedent. These antecedents are defined as all events which increase the probability of the future occurrence of depression. These events fall under the guise of various stressors including macrostressors (e.g., major life events), microstressors (e.g., work problems), and chronic difficulties (e.g., marital discord). As was evident in the dental stress literature many of the factors identified as being antecedents of stress and depression would fit into this model. For example, microstressors would include many of the various job related stressors such as difficulties in doctor-patient relations, management problems, economic problems etc. Chronic difficulties could include isolation, physiological stressors (i.e., cramped posture), time pressures, lack of social support, etc.

An extensive literature has been developed which has examined the relationship between such stressors and depression. For example, extensive research has demonstrated a relationship between life events and depression (e.g., Brown & Harris, 1978; Holohan & Moos, 1986; Paykel, 1973; Warheit, 1979). Research has indicated that the types of events most relevant to depression are loss or exit events (e.g., divorce or death) which have a negative effect on self-esteem. These events have been shown to occur more frequently in depressed individuals (Paykel, 1979) and have also been associated with suicide attempts (Slater & Depue, 1981) and relapse of depressive patients (Paykel & Tanner, 1976).

This is not to say, however, that every person who experiences negative life events will become depressed. The effects of life stress can be buffered if an individual has adequate social support. Research examining the relationship between social support and depression suggests that there is a strong inverse correlation between the two. For example, a central part of Brown and Harris's (1978) depression model involves the relationship between social support and depression. In their research (1978), Brown and Harris found that lack of an intimate, confiding relationship greatly increased the risk of depression in women following stressful events. Costello (1982) replicated this finding in a Canadian sample.

Availability of friends (Warheit, 1979) has also been associated with lower depression scores in people who have suffered a loss. Similarly, Lin, Dean, and Ensel (1986) found that social support both directly affects depressive symptoms and significantly mediates the effect of undesirable life events. Such effects remain strong and significant when other factors such as psychological resources (e.g., self-esteem) are taken into account. The adverse effects of such events are greatly reduced when an intimate and strong tie provides support during or after the event. As was suggested earlier, dentists often lack such social supports, at least among peers, due to the isolation and competitive nature of dentistry. According to the social support literature, this would make dentists likely candidates for experiencing depressive symptoms.

According to Lewinsohn et al. (1985), the occurrence of these antecedents is said to begin the depressogenic process by disrupting substantial, important, and automatic behavior patterns. It has been suggested by Langer (1978), that much of a person's everyday behavior is "scripted" and requires little mental effort. These "scripted" patterns are very important to the individual, however, as they are crucial to a person's everyday interactions with the environment. When an antecedent interrupts these typical behavior patterns an immediate, negative emotional response occurs. The degree of intensity of this response will be a function of the salience of the antecedent and/or the degree of disruption for the individual (Langer, 1978).

These disruptions, and the subsequent emotional reactions they foster, are assumed to be related to depression based on the extent to which they lead to a decrease in positive reinforcement and/or an elevated rate of aversive experience. In other words, if they shift the balance of a person's interactions with the environment in a negative direction they will likely lead to depression (e.g., Lewinsohn et al., 1979). Individuals will try and reduce the impact of such events on their level of reinforcement (Coyne, 1976a). These efforts will be successful to varying degrees, depending on both the individual's vulnerabilities and the individual's immunities which comprise the person's predisposing characteristics. These characteristics, according to Lewinsohn et al. (1985) are assumed to be relatively stable features of either the individual or the individual's environment. The immunities that Lewinsohn et al. (1985) have hypothesized to protect against depression are: high self-perceived social competence (Lewinsohn et al.,

1980), high frequency of pleasant events, and the availability of good social supports from family or friends (e.g., Brown & Harris, 1978).

Vulnerabilities, according to Lewinsohn et al. (1985), include several variables. One variable which has consistently been reported in the depression literature is the substantial sex difference, where adult females regularly demonstrate a preponderance of depressive symptoms. A sex ratio of 2:1 typically is found in both community survey populations and in diagnosed and treated cases (Hirschfield & Cross, 1982). Similar results have been obtained with an adolescent population (Allgood-Merten, Lewinsohn, & Hops, 1990).

A second vulnerability is age, where those individuals between 20 and 40 are most likely to suffer from depressive symptoms (Lewinsohn, Hautzinger, & Duncan, 1984). Recent community surveys have also found a higher prevalence of depressive symptoms in young adults relative to older adults (e.g., Comstock & Helsing, 1976; Craig, & Van Natta, 1979). In the Comstock and Helsing study rates of moderate to severe depression were substantially lower in all groups older than 18 to 24. Specifically, 19% of the subjects age 25 to 44, 15% of those age 45 to 64, and 15% of those age 65 or older scored in the depressed range. Other vulnerabilities according to Lewinsohn et al. (1985) include having low coping skills, being high on self-consciousness as a trait (Fenigstein, Scheier, & Buss, 1975), and having low self-esteem.

Another vulnerability which is not identified by Lewinsohn et al. (1985) per se but has been discussed in the dental stress literature is the dentist's personality characteristics (e.g., Forrest, 1978; Katz, 1986). Research indicates that personality factors play a role in how satisfied a dentist is with his or her career (Katz, 1982).

The importance of personality characteristics in the etiology of depression has been emphasized in various theories of depression, although disagreement exists with regard to terminology and the etiology of the characteristics themselves (e.g., Seligman, 1975; Chodoff, 1972). Furthermore, Lewinsohn in his earlier studies of depression, (e.g., Lewinsohn, 1974; Lewinsohn et al., 1979) as well as these other theories, postulated the existence of two depressive personality types. One is characterized by low self-esteem and high levels of obsessionality, the second by low frustration tolerance, increased dependence on others for support and approval and emotional lability. These characteristics act to sensitize the person to

situations involving loss of self-esteem (e.g., rejection or loss of loved one) and thus put the individual at risk for depression (Hirschfield & Cross, 1982). Dentists, as previously described, would likely fit the first depressive personality type of low self-esteem and high obsessionality.

Despite various theories of personality and clinical interest in the role of personality characteristics in depression, relatively few investigations into this area have been conducted. Two personality theorists who have discussed personality traits or temperaments in relation to depression are Buss and Plomin (1984). Temperaments are defined as clusters of inherited personality traits which are present in early childhood. According to Buss and Plomin, there are three main temperaments which make up an individual's personality. These are emotionality, which is the tendency to become upset easily and intensely and is comprised of fear, anger, and distress; sociability, which is the tendency to prefer the presence of others to being alone, and activity, which alludes to an individual's tempo or vigor. Buss and Plomin have developed a scale (the EAS Temperament Survey) based on their personality theory. According to this theory, depressed individuals would tend to score low on the sociability and activity subscales but high on the emotionality subscale. Unlike some personality scales such as the Eysenck Personality Inventory (Eysenck, 1969) where the dimensions measured (e.g., Eysenck's neuroticism factor) are often highly correlated with depression, the EAS Personality Scale measures the underlying temperament of the individual apart from their current mood state.

According to Lewinsohn et al (1985), when an individual is unable to reverse the depressogenic process (either through increasing positive reinforcement or decreasing negative reinforcement and subsequently producing a return to the normal "scripted" behavior) an increase in self-consciousness occurs. The literature on self-consciousness indicates that such a heightened state has several ramifications for the depressogenic process. For example, Ickes, Wicklund and Ferris (1973) found that an increase in self-consciousness is accompanied by an increase in self criticism. Other research has also found that high self-consciousness and depression are significantly correlated both in college samples (Smith & Greenberg, 1981; Ingram & Smith, 1984), and in clinically depressed adults (Ingram, Lumry, Cruet & Sieber, 1989). Smith, Ingram and Roth (1985) also demonstrated that increased self-consciousness is uniquely associated with depression and not with other signs of psychological disturbance

(i.e., trait anxiety) and that among depressed individuals, current level of depressed mood is positively correlated with self-consciousness. An increase in self-consciousness has also been shown to result in greater acceptance of responsibility for outcome (i.e., internal attributions, Buss & Scheier, 1976; Duval & Wicklund, 1973), in behavioral withdrawal (Carver & Scheier, 1981), and in social problems (Fenigstein, 1979).

Lewinsohn et. al (1985) postulate that an increase in self-consciousness is believed to break down the self-enhancing cognitive schemata a person possesses (e.g., Alloy & Abramson, 1979) which increases self criticism and behavioral withdrawal. A further consequence of this heightened self-consciousness is a magnification of the initial dysphoria that the individual experienced. This increase in dysphoria, in turn, leads to many of the behavioral, cognitive, and emotional changes that have been shown to correlate with depression. For example, increased self-consciousness and being dysphoric tends to increase a person's complaining and withdrawal, which leads to a negative impact on others (Coyne, 1976a; Hammen & Peters, 1978). These changes are then presumed to intensify the self-consciousness and dysphoria which creates the cycle necessary to maintain the depressive state.

Overall, Lewinsohn et al. (1985) suggest that their model takes into account much of what is known about depression and allows for the heterogeneity and multiplicity of depressive symptoms that have been observed. As well, the model allows for many entry points into the chain of events leading to depression which, in turn, allows for a multiplicity of causes, none of which, however, are essential. Furthermore, the model predicts that the prevalence and incidence of depression should be high given the number of entry points and diversity of potential antecedents. Conversely, while the model implies that episodes of depression are common, most will be of short duration because there are a large number of person-initiated and environmental changes which can act to reverse the depressogenic cycle.

Theoretical Model for the Study

By combining Lewinsohn et al's (1985) model with other factors (i.e., personality and job stressors) believed to correlate with stress and depression in dentists, a new model, capable of explaining the development of depressive symptoms in dentists, is derived (see Figure 1).

According to this model, job related factors (measured as job satisfaction), external or non-job related factors (i.e., social support frequency and intensity of positive reinforcement and stressful life events), personality characteristics and certain demographic variables all play a role in leading to a cognitive diathesis for depression. If changes in the factors at Level I are sufficient to cause cognitive changes (i.e., decreased self-esteem and increased self-consciousness) at Level II, the result is the presence of depressive symptoms at Level III. Certain interactions between Level I factors will influence the effect of these factors on the development of depressive symptoms. For example, as Lin, Dean, and Ensel (1986) found, individuals with good social support are less effected by stressful life events. On the other hand, dentists who have a more "depressive" personality temperament according to Buss and Plomin (1984) are more likely to be affected by stressful life events.

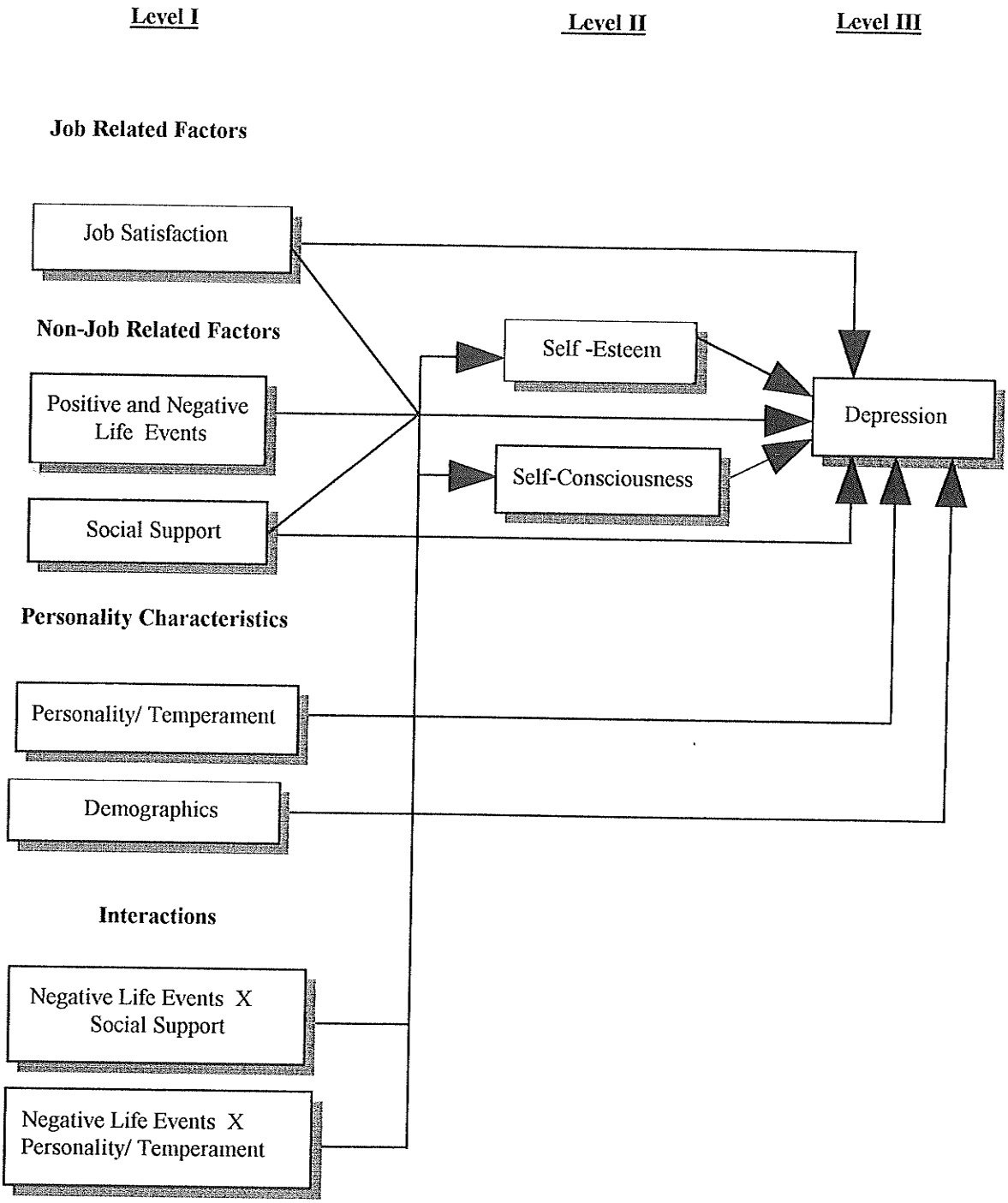


Figure 1. Theoretical model for the study

Note. Among the demographic variables, gender is hypothesized to predict depression with females scoring higher than males. Also, it is hypothesized that age is inversely related to depression.

Hypotheses

Based on the review of the literature and the model in Figure 1, the following hypotheses are proposed.

1) Female dentists should be more depressed than male dentists.
2) Younger dentists will be more depressed than older dentists.
3) Dentists will be more depressed than comparable members of the general population.
4) Depression will be directly related to the frequency and intensity of unpleasant or stressful life events the dentist has experienced in the past month.
5) Depression will be inversely related to the frequency and intensity of pleasant events that the dentist has experienced in the past month.
6) Depression will be inversely related to the level of social support that the dentist receives.
7) Depression will be inversely related to the level of self-esteem.
8) Depression will be directly related to the level of self- consciousness.
9) Depression will be inversely related to the degree of job satisfaction.
10) Job satisfaction will be directly related to self-esteem and inversely related to self-consciousness.
11) Pleasant life events will be directly related to self-esteem and inversely related to self-consciousness.
12) Unpleasant life events will be inversely related to self-esteem and directly related to self-consciousness.
13) Social support will be directly related to self-esteem and inversely related to self-consciousness.

14) An inverse relationship should exist between the dentist's level of social support and the frequency and experienced intensity of unpleasant or stressful life events over the past month.

15) Dentists who are high on emotionality but low on activity and sociability (according to Buss and Plomin, 1975) will be more depressed than those with different identifiable traits.

16) Dentists who are high on emotionality, but low on activity and sociability will experience greater intensity of stressful life events.

17) Dentists who are high on emotionality but low on activity and sociability will have lower self-esteem and higher self-consciousness than dentists with different identifiable traits.

METHOD

Subjects

The subject pool for the study involved all practicing dentists in the Province of Manitoba, a group totaling 512 members.

Procedure

Data were collected through a self-administered mailout survey during the spring of 1991. This method was chosen because, compared to other survey methods (e.g., telephone or in-person), mail surveys tend to be relatively inexpensive and generally require less time investment. As well, interviewer bias is eliminated from a mail out questionnaire and respondents tend to be more honest in their answering of sensitive questions (Backstrom & Hursh-Cesar, 1981).

The Total Design Method (TDM) developed by Dillman (1978) was used in the study. Based on previous research using the TDM a response rate in excess of 60% was expected (Dillman, 1978). The TDM provides a standardized set of procedures for both questionnaire construction and survey implementation. These procedures were strictly adhered to in the present study.

Construction of the questionnaire utilizing TDM guidelines resulted in the production of an interesting and extensive questionnaire requiring approximately 30 minutes to complete (Appendix A). TDM implementation procedures used in the study were designed to gain the trust of the prospective respondents, minimize the cost of participation, and provide some incentives for completing the questionnaire. The mail-out package consisted of a cover letter on university stationary (Appendix B), a letter of support from the Manitoba Dental Association (Appendix C), a questionnaire booklet, and a postage paid return envelope. The cover letter in the first mailout was constructed to introduce the research, encourage respondents to participate, guarantee confidentiality to respondents, and promise participants a copy of the research findings contingent on the completion of the questionnaire.

The initial mailout to all participants was sent on the same day. A postcard follow-up reminder (Appendix D) was sent to all participants one week after the initial mailout. A second questionnaire was sent to those dentists who had not responded three weeks after the first mailout. The cover letter accompanying the second mailout (Appendix E) focused on the importance of having all dentists participate in the study.

Measures

Measures were developed or chosen for the questionnaire based on the suggestion by Dillman (1978) that they should maximize simplicity, brevity, and high internal reliability . Ordering of the items in the questionnaire followed the four basic principles outlined by the TDM (Dillman, 1978). First, questions were placed according to their perceived social usefulness; those that were most likely to be viewed as useful by the respondents occurred at the beginning of the questionnaire while those less likely to be viewed as useful were entered at the end of the survey. Second, questions of similar content were grouped together as much as possible. Third, groups of questions were ordered in a manner so that adjacent groups were related as much as possible. This was done to maximize the continuity in the questionnaire. Finally, more sensitive items were placed after less sensitive items to encourage respondents to answer these questions. As suggested by Dillman (1978), a draft copy of the questionnaire was piloted on two groups to identify problems with lack of variability in answers, instructional confusion, or wording difficulties. These two groups included mental health professionals familiar with survey research (N=5) and potential users of the survey results (members of the executive of the Manitoba Dental Association, N=5). Changes to the questionnaire format were made based on the feedback and data obtained from these pilot samples.

The final questionnaire included a series of measures that operationalized the variables identified in the proposed theoretical model. These included job-related factors, non-job related factors, personal characteristics, cognitive variables, and the depression measure.

Job Related Factors

Job Satisfaction

The Dental Satisfaction Survey is a 51 item self-report measure of job satisfaction appropriate for dentists, dental hygienists, and dental assistants (Chapko, Bergner, Beach, Green, Milgram, & Skalabrin, 1986). Only 49 of the 51 questions were utilized in this study as the last 2 questions dealt with work absences and were not relevant to the objectives of the research. Items are grouped into 12 subscales including income, recognition, opportunity to develop professionally, time to develop professionally, responsibility, non- patient tasks, staff relations, quality of care, leisure time, fatigue, time pressure, and general satisfaction. Chapko et al. (1985) report that the internal reliability of subscales ranges from .68 to .95 for the measure. The authors also report that preliminary work with the scale indicates that it has good concurrent validity but that it needs to be further validated with other, similar measures.

Non-Job Related Factors

Pleasant Events

Twenty-six items from the 320 item Pleasant Events Schedule (PES, MacPhillamy & Lewinsohn, 1971) were used to measure the frequency and enjoyment or intensity of pleasant events which have occurred in the subject's life over the past month. These 26 items constitute the most discriminating items that differentiate depressed from non-depressed individuals (MacPhillamy & Lewinsohn, 1976). The internal reliability of this measure has been shown to be as high as .78 (e.g., Lewinsohn, Hoberman, & Rosenbaum, 1988). As well, the measure has demonstrated an acceptable level of concurrent, predictive and construct validity (MacPhillamy & Lewinsohn, 1976).

Life Stress

Thirty-five items from the 320 item Unpleasant Events Schedule (UES, Lewinsohn, 1978), were used to assess the frequency and experienced aversiveness or intensity of stressful life events for the subjects. These 35 items have been shown to correlate strongly with depression (Lewinsohn & Talkington, 1979). The test-retest reliability for these items has been shown to be in the .60 to .80 range (Lewinsohn, Mermelstein, Alexander, & MacPhillamy, 1983). Validity studies performed on the UES indicate that it correlated in the expected manner with similar self-report measures (Lewinsohn & Talkington, 1979).

Social Support

Twelve items from the 26 item Instrumental - Expressive Social Support Scale (Lin, Dean & Ensel, 1986) were used to assess social support for the subjects. These 12 items are those which explicitly identify social support in relationships. Lin et al. (1986) report an internal reliability of .89 for this measure and indicate that the scale has strong internal consistency and predictive validity.

Personality Characteristics

Personality was assessed by the EAS Temperament Survey for adults (Buss & Plomin, 1984). The EAS is a 20 item, self-report measure that assesses three temperaments, emotionality,(which is composed of distress, fearfulness, and anger); activity level and sociability, which the authors believe are the basis of an individual's personality. These three temperaments are believed to be stable, inherited personality traits which are present in early childhood. Studies (e.g., Buss & Plomin, 1984), indicate that the test-retest reliability of the three subscales is as follows; 1) Emotionality = .82, 2) Activity = .81, 3) Sociability = .85. The authors also indicate that the EAS has adequate validity when compared to other personality measures (e.g., Eysenck & Eysenck, 1969).

Demographic measures

The major demographic characteristics to be measured in the study include gender, age, marital status, work status, years in practice, type of practice, specialty area, time spent seeing patients, practice location, and income. These measures are developed from social-demographic items used in a study by Katz (1982).

Cognitive Variables

Self-Esteem

The Rosenberg Self - Esteem Inventory is a self-report measure in which respondents rate their agreement with 10 statements that describe what they are like (Rosenberg, 1965). Silber and Tippett (1965) have reported an internal reliability of .76 for this measure and indicate that it has strong construct and discriminant validity.

Self-Consciousness

The 18 item Self Consciousness Scale is a modification by Burnkrant and Page (1984) of the original 23 item Self Consciousness Scale developed by Fenigstein, Scheier and Buss (1975). This shorter version has been shown to have better internal reliability (.78) than the original scale (Burnkrant & Page, 1984) and has been found to correlate highly with other measures of self-consciousness.

Depression

The Center for Epidemiological Studies-Depression (CES-D) Scale was used to measure depression levels in the study. The CES-D scale is a 20 item self-report measure and was developed by Radloff (1977). This scale is based on items from other depression scales including those of Beck, (Beck, Ward, Mendelson, Mack & Erlbaugh, 1961), the Minnesota Multiphasic Personality Inventory (MMPI; Dahlstrom & Welsh, 1960), and self report scales developed by Gardner (1968), and Raskin, Schulterbrandt, Reating, and McKeon (1969). It is the scale most widely used in epidemiological studies (Boyd & Weissman, 1981) and has been shown to be a reliable measure of depression, demonstrating an internal reliability of .89 (e.g., Weissman & Klerman, 1977). Furthermore, it correlates significantly with other depression measures, indicating that it has strong validity. The CES-D score is a reflection of depressive symptoms and cannot be equated with clinical diagnosis of depression. The four possible responses to each of the 20 questions are weighted 1 for "rarely or none of the time" to 4 for "most or all of the time". Questions numbered 4, 8, 12, and 16 are scored in reverse. The range of possible scores is from 0 to 60. High scores indicate both the presence and persistence of symptoms (i.e., scores equal to or greater than 16).

RESULTS

Data Preparation

Prior to the analysis, the data were examined for coding accuracy, missing values, and outliers. The computerized data files of ten percent of the subjects were randomly chosen and compared to their raw questionnaire data. No coding errors were found in the data using this method.

The amount of missing data on individual variables ranged from 0-5.2% of cases in the sample of 306. Missing values within the various survey measures (i.e., self-esteem, social support etc.) were dealt with by inserting the mean value calculated from the available data on a particular measure. This method of dealing with missing data is one that is recommended by Tabachnick and Fidell (1989) and Cohen and Cohen (1983) .

Following procedures suggested by Tabachnick and Fidell (1989), the residual scatter plots for the individual measures and the predicted depression scores were examined and revealed the presence of one univariate outlier which was excluded from subsequent analysis. Inspection of histograms, normal probability plots and skewness and kurtosis values indicated that the assumptions of normality, linearity, and homoscedasticity were being met.

Internal Reliabilities of Measures

Internal reliabilities were calculated for the various measures used in the statistical analysis. As shown in Table 1, Cronbach's alphas for these measures ranged from .61 to .93. These alpha levels are considered suitable for representing unidimensional constructs.

Table 1
Cronbach's Alphas for Multiple Item Measures

Variable	Alpha coefficient
Dental Job Satisfaction Questionnaire	.85
Self -Consciousness Scale	.87
Social Support Scale	.83
Rosenberg Self-Esteem Scale	.85
Pleasant Events Schedule : Frequency	.83
Pleasant Events Schedule : Rate	.90
Unpleasant Events Schedule : Frequency	.84
Unpleasant Events Schedule : Rate	.93
Emotion Scale of EAS	.84
Activity Scale of EAS	.67
Sociability Scale of EAS	.61
Centre for Epidemiological Studies-Depression	.92

Sample Return Rate

Of the 512 dentists who were part of the original sample, 306 returned completed questionnaires. This represents a 60% return rate and equals the expected return rate for mail surveys which are conducted using the TDM (Dillman, 1978). This rate greatly exceeds the response rate of similar mail surveys conducted with dentists that did not utilize the TDM. For example, Wilson (1984) and Rankin and Harris (1990b) reported return rates of 41% and 40%, respectively, for mail surveys of dentists.

Demographic Characteristics

The demographic characteristics of the sample are summarized by sex in Table 2. Within the sample there were 265 males, 38 females and 3 respondents who did not identify their sex. The majority of subjects were between 30 and 39 years old (40.6%). 79.8% of the sample was married and most (91%) worked full-time. With respect to years in practice, there was a fairly even distribution across the sample with the majority practicing between 11 and 19 years. A significant number of subjects (45.4%) were working solo and 86.1% of the respondents held a general practice. Most subjects (33.4%) worked the standard 36-40 hour work week with only 2.7% working 50 hours or more per week. A large proportion of the sample was from within the Winnipeg city limits (74.6%). There was wide variation between subjects in terms of personal income with the largest proportion of the sample (19.8%) earning $75,000 to $99,999 a year. The female dentists had consistently lower salaries than their male counterparts, with 69% of the women earning less than $75,000 per year.

Table 2

Social-Demographic Characteristics of the Study Sample

	MALES		FEMALE		TOTAL	
	N	%	N	%	N	%
Sample	265	86.6	38	12.4	303	99.0
Age Groups						
Under 30	27	10.2	11	28.9	38	12.5
30-39	101	38.1	22	57.9	123	40.6
40-49	67	25.2	4	10.5	71	23.4
50-59	41	15.4	1	2.6	42	13.8
60-69	23	8.6	0	0	23	7.5
Over 70	6	2.2	0	0	6	1.9
Marital Status						
Single	29	10.9	8	21.0	37	12.2
Common-law	5	1.9	2	5.2	7	2.3
Married	216	81.5	26	68.4	242	79.8
Divorced	9	3.4	0	0	9	2.9
Widowed	4	1.5	0	0	4	1.3
Separated	1	0.4	2	5.3	3	1.0
Employment Status						
Full-time	252	95.0	24	63.2	276	91.0
Part-time	10	3.8	13	35.1	27	8.9
missing	3		1		4	
Years in Practice						
< 1 year	8	3.0	2	5.3	10	3.3
1-4	22	8.3	11	28.9	33	10.9
5-10	56	21.7	12	31.6	68	22.4
11-19	80	30.2	10	26.3	90	29.7
20-29	63	23.8	3	7.8	66	21.8
> 30 years	36	13.6	0	0	36	11.9

	MALES		FEMALES		TOTAL	
	N	%	N	%	N	%
Type of Practice						
Solo	126	49.0	7	19.4	133	45.4
Group	47	18.2	7	19.4	54	18.4
Partnership	33	12.8	2	5.6	35	11.9
Association	28	10.9	14	38.9	42	14.3
Military	4	1.6	0	0	4	1.4
Public Hlth	10	3.9	3	8.3	13	4.4
Dental Educ.	9	3.5	3	8.3	12	4.1
missing	8		2		10	
Type of Dentistry						
General	220	84.9	35	94.6	255	86.1
Orthodontics	9	3.5	1	2.7	10	3.3
Pedodontics	7	2.7	1	2.7	8	2.7
Periodontics	6	2.3	0	0	6	2.0
Endodontics	2	0.8	0	0	2	0.7
Oral Surgery	7	2.7	0	0	7	2.4
Prostho.	3	1.0	0	0	3	1.0
Crown & Bridge	5	1.9	0	0	5	1.6
missing	6		1		7	
Hours Worked						
< 25	23	8.8	10	26.3	33	11.0
26-30	23	8.8	5	13.2	28	9.4
31-35	85	32.6	8	21.1	93	31.1
36-40	90	34.5	10	26.3	100	33.4
41-49	33	12.6	4	10.5	37	12.4
> 50	7	2.7	1	2.6	8	2.7
missing	4				4	
Location						
Rural	36	13.9	4	11.1	40	13.6
Small Urban	33	12.7	2	5.6	35	11.9
Urban	190	73.4	30	83.3	220	74.6
missing	6		2		8	

	MALES		FEMALES		TOTAL	
	N	%	N	%	N	%
Personal Income						
> $50,000	17	7.0	12	33.3	29	10.4
$50-74,999	41	16.9	13	36.1	54	19.4
$75-99,999	50	20.7	5	13.9	55	19.8
$100-124,999	45	18.6	4	11.1	49	17.6
$125-149,999	23	9.5	1	2.7	24	8.6
$150-174,999	17	7.0	1	2.7	18	6.5
$175-199,999	17	7.0	0	0	17	6.1
< $200,000	32	13.2	0	0	32	11.5
missing	23		2		25	

Prevalence of Depression

Figure 2 provides the frequency distribution for the CES-D scale scores by sex of the total sample. The figure shows that there were 80.8% of the males and 76.3% of the females classified as not depressed (CES-D score less than 16). As well, 6.8% of the males and 7.9% of the females were mildly depressed, 9.8% of the males and 0% of the females were moderately depressed, and 2.6% of the males and 15.8% of the females were severely depressed. In total, 19% of the males and 24% of the females had scores above the depression cut-point of 16 on the CES-D scale. The overall prevalence rate for the sample was 20% which falls within the usual 15-21% range found in other studies using the CES-D scale (Barnes et al., 1988).

Table 3 shows the results of an analysis of variance comparing the CES-D scores broken down by gender and age. The table reveals that the female dentists were not significantly more depressed F $(1, 179) = 1.87$, $p < .17$, than the male dentists as hypothesized. No significant differences were found to exist between the different age categories of the dentists either.

Comparison of Sample to the Winnipeg Population

Table 4 compares the CES-D mean scores in the dentist sample with sub-samples of the 1983 Winnipeg Area Study (WAS) sample that were similar on social-demographic characteristics. The WAS is an annual, in home, interview style, survey conducted on a random sample of households in the city of Winnipeg. Included in this survey are a number of items focusing on social-demographic information. As well, other questionnaires (i.e., the CES-D) can be included by any researcher who wishes to gain information from a general population sample. Standard deviations can then be computed from the WAS database for comparison to other samples. It has been found (e.g., Currie, 1986, 1989) that samples from the WAS have been consistently representative of the Winnipeg population on social-demographic characteristics. For the 1983 WAS, 701 addresses were randomly chosen and 524 interviews were completed, yielding a response rate of 75 percent.

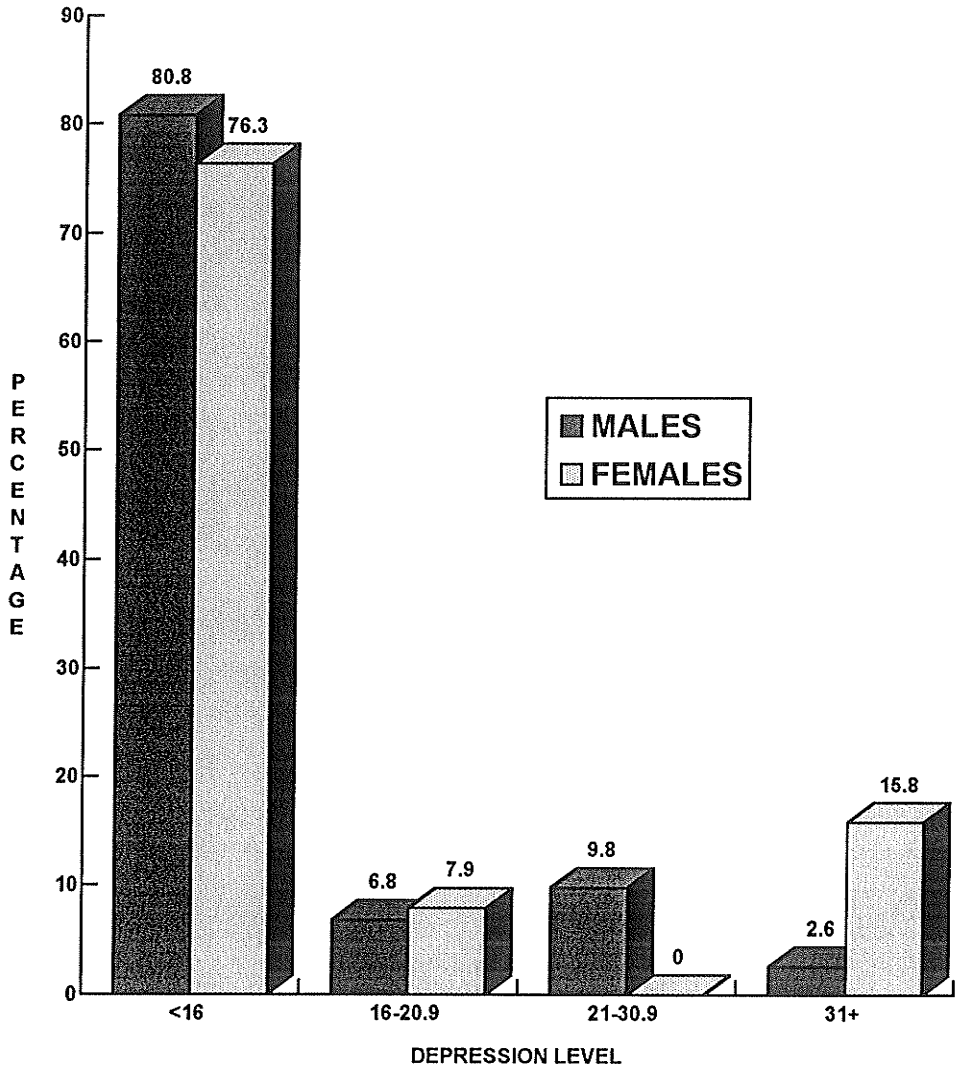


Figure 2. Frequency Distribution of the CES-D Scale Scores for the Study

Table 3

Analysis of Variance in CES-D Scores as a Function of Gender and Age

Source	CES-D M	SS	df	MS	F
Sex					
Females	11.70	179.20	1	179.20	1.87
Males	9.38				
Age					
under 30	9.60	306.58	5	61.32	0.63
30 - 39	11.28				
40 - 49	11.15				
50 - 59	8.95				
over 60	8.25				
Sex X Age					
		21.20	3	7.07	0.07

Note. CES-D = Centre for Epidemiological Studies - Depression.
$p < .05$

Table 4

Matched Comparison of Study Sample and the 1983 Winnipeg Area Study (WAS83) on Mean CES-D Scale Scores

Characteristic	Males					Females				
	Study		WAS83		T-test	Study		WAS83		T-test
	N	M	N	M		N	M	N	M	
All Subjects	265	9.37	231	8.33	1.37	38	11.70	290	9.48	0.99
Education	265	9.37	51a	6.49	2.44*	38	11.70	43a	7.98	1.54
Income	265	9.37	44b	6.20	2.83**	38	11.70	49b	8.41	1.34
High SES groupc	265	9.37	16c	4.0	5.16**	38	11.70	14c	7.93	1.44

Note. T-test = Student's T-test.

a denotes subjects who have a university education. b denotes subjects whose income is greater than $40,000. c denotes group of subjects with a university education and income greater than $40,000.

* $p < .05$. two-tailed test
** $p < .01$. two-tailed test

As shown in Table 4, the study sample CES-D mean scores were higher for both males and females than those of the general population but these differences were not statistically significant. The groups were also compared on several socio-demographic variables including age, marital status, employment status, occupation, education, and income. Analysis of variance was used to compare the age and marital status variables as there were more than two levels of these independent variables for each group. Neither the age F (5, 302) = 0.63 $p < .84$, nor the marital status variable F (5, 302) = 2.30 $p < .06$, proved to be significant however. Student's T-tests were performed on the other variables and revealed significant findings for only the education and income variables. These variables, therefore, are the only ones listed on Table 4. In both cases, the male dentists had significantly higher mean depression scores than their matched general population counterparts. In the case of the female subjects, the small sample sizes appear to have nullified any significant findings between the two groups When the education and income variables were combined to form a "high SES group" the male dentists continued to have a significantly higher mean depression scores than the WAS subjects in this group. It should be noted, however, that the number of male and female WAS subjects in this high SES group was only 16 and 14 respectively. Thus, any generalizations based on these comparisons are made with some caution due to the small sample size.

Figure 3 provides a comparison of the mean depression scores for the Study and WAS samples matched only by age. It can be seen that the dentists mean depression scores are consistently higher than the general population sample across all age groups except the under 30 group. As mentioned above, however, there was no significant interaction between age and depression scores for either sample.

Table 5 compares the two samples by age and depression level. As suggested by Barnes and Prosen (1984) and Hsu and Marshall (1987), the following classifications were used to rank the CES-D scores: 0 to 15.5 = not depressed; 16 to 20.5 = mild depression; 21 to 30.5 = moderate depression; and 31 and above = severe depression. According to this breakdown, the highest number of depressed people for both groups were in the 30-39 year old age category. This age group also produced the highest number of severely depressed individuals for both samples. Once again, as shown in Table 4, none of these findings were statistically significant.

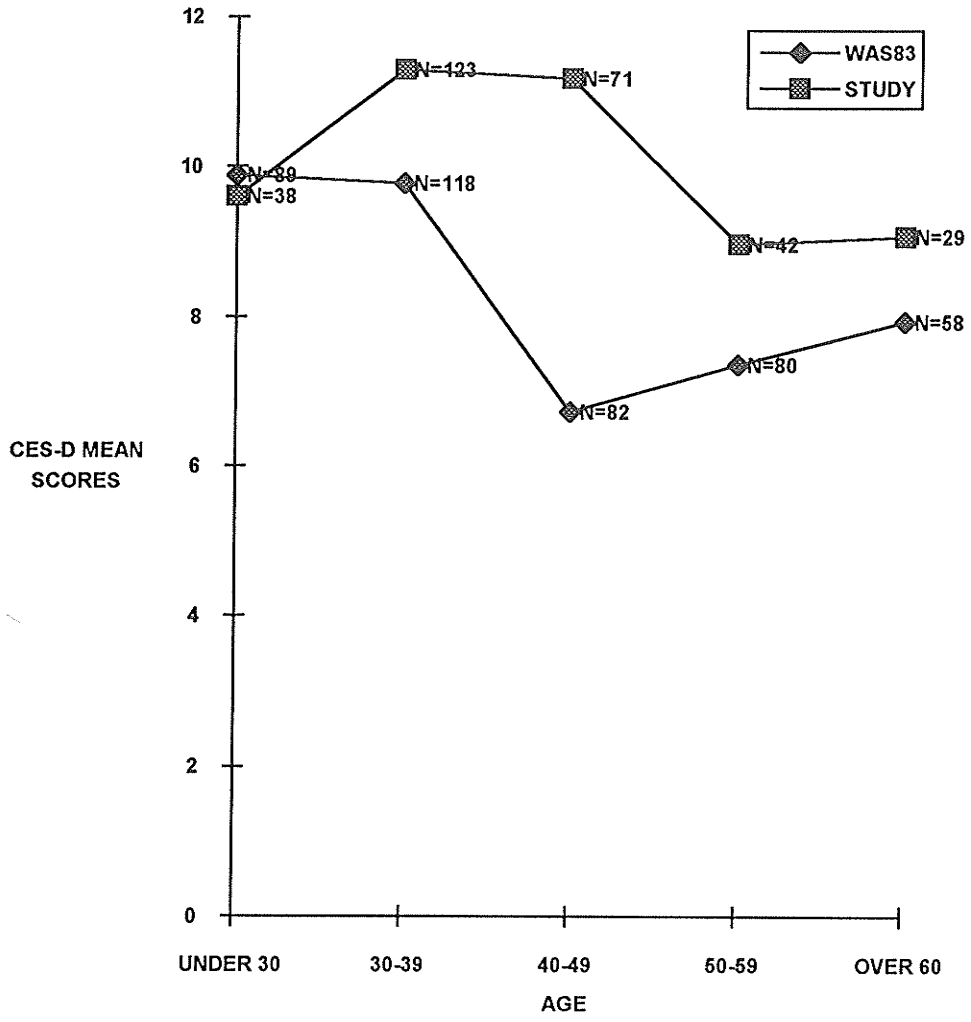


Figure 3. Mean Depression Scores (CES-D) as a Function of Age

Table 5

Comparison of the Study Sample and the 1983 Winnipeg Area Study (WAS83) by Age and Depression Level

	STUDY				WAS83			
Depression level	**Mild**	**Moderate**	**Severe**	**N**	**Mild**	**Moderate**	**Severe**	**N**
Age								
under 30	2	2	1	5	8	6	1	15
30-39	10	11	7	28	5	12	3	17
40-49	7	4	5	16	2	6	1	9
50-59	2	4	0	6	6	1	2	9
over 60	0	4	0	4	9	4	2	15
Total	21	25	13	59	30	29	9	68
% of total	36	42	22		44	43	13	

Note. Only subjects with a Centre for Epidemiological Studies-Depression score greater than 16 were included in this comparison.

Correlational Relationships among the Dependent and Independent Variables

The Pearson product-moment correlation coefficients for the dependent and independent variables (see Table 6) were calculated in order to assess the relationship between these variables and check for multicollinearity. Tabachnick and Fidell (1989) suggest that when two variables demonstrate a high correlation (i.e., greater than .80) multicollinearity may be a problem. Examination of the correlation matrices revealed no difficulties with multicollinearity amongst the measures.

Many of the proposed hypotheses mentioned in the introduction were confirmed based on the results in this correlation matrix. For example, depression was directly and significantly related to the frequency ($r=.43$, $p=.001$) and the intensity ($r=.23$, $p=.001$) of unpleasant life events that the dentist had experienced over the past month, thus confirming hypothesis 4. As well, depression was significantly ($r=-.40$, $p=.001$) inversely related to the frequency of pleasant events but not to the intensity of these events. Hypothesis Five was, therefore, not fully supported. There was a significant inverse correlation between social support and depression (hypothesis 6), job satisfaction and depression (hypothesis 9) and a significant, direct relationship between depression and self-consciousness (hypothesis 8). Hypothesis 7 postulated that depression would be inversely related to self-esteem. It is important to note that on the Rosenberg Self-Esteem Scale a low score was indicative of high self-esteem, therefore, although it appears that a positive correlation existed between self-esteem and depression on Table 6, it was, in fact, low self-esteem that was correlating positively with depression. Thus, this hypothesis was confirmed.

Another hypotheses that can be examined using this correlation table was hypothesis 10, which stated that job satisfaction would be directly related to self -esteem and inversely related to self-consciousness. According to Table 6, this hypothesis was supported, as there was a significant positive correlation with high self-esteem (keeping in mind that the Rosenberg scale is scored in the opposite direction, as mentioned above) and a significant negative correlation with self-consciousness. Furthermore, both the frequency and intensity of pleasant events were significantly and positively correlated with high self-esteem, but only the frequency of these events was significantly, negatively related to self-consciousness ($r=-.24$, $p=.001$). As far as unpleasant events were concerned (hypothesis 12), the frequency of these

events produced a significant inverse relationship to high self-esteem, while the intensity of such events were negatively correlated, but not in a significant manner. The frequency and intensity of unpleasant life events did, however, significantly and directly relate to self-consciousness ($r=.32$, and $r=.28$, $p< .001$. respectively).

Another hypothesis (13), postulated certain relationships between the perceived level of social support that the dentists had and their self-appraisal of self-esteem and self-consciousness. In this case, the hypothesis was fully confirmed, as a direct relationship did exist between high self-esteem and social support, while self-consciousness and social support were inversely related.

The final hypothesis that was examined using the correlation table stated that an inverse relationship would exist between social support and the frequency and intensity of unpleasant life events. There was a significant negative correlation between the frequency ($r=-.46$, $p=<.001$.) but not the intensity of these events and social support.

Table 6

Pearson Correlations Among the Study Measures

	1	2	3	4	5	6	7	8	9	10	11	12
1 DENT												
2 DPROB	-.56*											
3 EST	-.37*	.28*										
4 SELF	-.28*	.30*	.39*									
5 FPLES	.31*	-.22*	-.35*	-.24*								
6 RPLES	.21	-.10	-.27*	-.05	.44							
7 FUPES	-.42*	.31*	.31*	.32*	.01	-.04						
8 RUPES	-.13	.18	.12	.28*	.10	.07	.29					
9 SOC	.28*	-.20	-.35*	-.32*	.30*	.13	-.46*	-.15				
10 TE	-.34*	-.35*	.47*	.43*	-.28*	-.13	.28*	.21	.44*			
11 TA	-.03	.06	-.06	-.04	.17	.12	.13	-.03	.01	.08		
12 TS	.25*	-.16	-.28*	-.14	.29*	.20	-.13	-.15	-.15	-.13	.22*	
13 CESD	-.37*	.31*	.48*	.38*	-.40*	-.12	.43*	.23*	-.51*	.44*	.01	-.15

Note. DENT=Dental Job Satisfaction Questionnaire; DPROB=Dental Problems Subscale of DENT; EST=Rosenberg Self-Esteem Scale; Self=Self Consciousness Scale; FPLES= Pleasant Events Schedule: Frequency; RPLES=Pleasant Events Schedule:Rate; FUPES=Unpleasant Events Schedule:Frequency; RUPES=Unpleasant Events Schedule:Rate; SOC=Social Support Scale; TE=Emotion Subscale of EAS; TA=Activity Subscale of EAS; TS=Sociability Subscale of EAS; CES-D=Centre for Epidemiological Studies-Depression.

* $p \leq .001$.

Further statistical analyses were conducted in four stages using the SAS statistical package. The first stage involved multivariate hierarchical regression analyses to test the proposed theoretical model and evaluate the contribution of the predictor variables to the dependent variable of depression. The second stage of analysis consisted of several ANOVA's used to examine the interactions between the personality characteristics (measured by the EAS) and depression, as well as several of the other predictor variables. In the third stage, separate hierarchical regression analyses were carried out using the Rosenberg Self-Esteem Scale and the Self-Consciousness Scale as the dependent variables. This analyses was conducted in order to assess how predictive the other independent variables were of these cognitive variables. In the final stage of the analysis, the most significant variables were analyzed to produce a revised, overall model which best explains how the various independent variables are related to depression.

Hierarchical multiple regression is an analytic strategy that involves the entry of independent variables into the regression equation in a particular order specified by the researcher. Each independent variable is then assessed in terms of it's addition to the equation at the point of entry. The order of entry of variables into the equation is generally based on theoretical considerations such that independent variables that are presumed to be of greater theoretical importance can be given a higher priority of entry (Tabachnick & Fidell, 1989). According to the model proposed in this study, the cognitive variables (Self-Consciousness and Self-Esteem) were postulated to be the critical variables in determining if depressive symptoms would be present in the dental population or not. Thus, these variables were entered first into the regression equation. The second step involved adding the job variables (Job Satisfaction Scale and Job Problem Subscale), the various life event variables (frequency and intensity or rate of both the pleasant and unpleasant events), the Social Support and EAS Personality Scales, and the demographic variables. Several demographic variables were deleted from the analysis (e.g., income variables, type of practice) due to missing data. The entries at the second step were based on the predictions that environmental, situational, and personality factors are the primary triggers of the depressogenic process and subsequently lead to the cognitive changes that result in the development of depressive symptoms.

In the third and final step, the hypothesized two-way interactions between the frequency and rate of unpleasant events and the personality and social support variables were added to the equation.

Significance tests were then carried out based on the change in R^2, to evaluate if the increasingly complex regression model was significantly different than the one previous to it. If significance was reached, it indicated that the added information at the particular step did contribute to the explained variance of the dependent variable, depression (Tabachnick and Fidell, 1989).

Results of the regression analyses for the CES-D scale are shown in Table 7. In the first step of the regression, the cognitive variables explained 32% of the variance, both self-consciousness and self-esteem were significant ($p < .001$) predictors of depression .

Entrance of the job variables, pleasant and unpleasant event variables, social support variable, personality variables and the demographic variables in the second step of the analysis predicted another 18% of the variance, F change (39, 263) = 3.97, $p < .001$. Within this step, the frequency of pleasant events and the social support variable were the most significant predictors ($p < .001$), while the frequency of unpleasant events, the emotion subscale of the EAS ($p < .01$) and age ($p < .05$) were less significant predictors of depression.

In the third and final step of the regression, the interactions were entered into the equation. The amount of variance accounted for increased by 2% and there was a significant F change (8, 255) = 2.67, $p < .001$. None of the variables in this step, however, were significant predictors of depression.

Table 7

Hierarchical Multiple Regression of Model Variables

Variables entered	Beta	R^2 Change	R^2 Total
Step 1			
Self-consciousness scale	**.26*** **		
Self-esteem scale	**.41*** **		
Total for Step		**.32*** **	**.32**
Step 2			
Self-consciousness scale	.10*		
Self-esteem scale	.18**		
Job Satisfaction Scale	**-.09**		
Job problem subscale	**.04**		
Pleasant events: freq.	**-.22*** **		
Pleasant events: rate	**.07**		
Unpleasant events: freq.	**.19****		
Unpleasant events: rate	**.04**		
Social Support Scale	**-.20*** **		
Emotion Scale of EAS	**.18****		
Activity Scale of EAS	**.01**		
Sociability Scale of EAS	**.02**		
Sex	**.01**		
Age	**.12***		
Marital status	**- .00**		
Work status	**- .02**		
Hrs worked per wk	**.01**		
Practice location	**.03**		
Total for Step		**.18*** **	**.50**
Step 3			
Self-consciousness scale	.11		
Self-esteem scale	.16*		
Job Satisfaction Scale	-.06		
Job problem subscale	.07		
Pleasant events: freq.	-.18*		
Pleasant events: rate	.05		
Unpleasant events: freq.	.68*		
Unpleasant events: rate	.07		
Social Support Scale	-.22*		
Emotion Scale of EAS	.10*		
Activity Scale of EAS	.01		

Variables entered	Beta	R^2 change	R^2 total
Step 3 continued			
Sociability Scale of EAS	.07		
Sex	.01		
Age	.12		
Marital status	-.04		
Work status	-.02		
Hrs worked per wk	.00		
Practice location	.03		
Un.E. Freq. X EASE	**.13**		
Un.E. Freq. X EASA	**.13**		
Un.E. Freq. X EASS	**-.26**		
Un.E. Rate X EASE	**.39**		
Un.E. Rate X EASA	**-.09**		
Un.E. Rate X EASS	**.14**		
Un.E. Freq. X Soc. Sup.	**-.44**		
Un.E. Rate X Soc. Sup.	**-.38**		
Total for Step		**.02*** **	**.52**

Note. Bolded lines denote variables added to model at each step. Un.E.Freq.= Unpleasant Events Schedule: Frequency; Un.E.Rate = Unpleasant Events Schedule:Rate; Soc. Sup.= Social Support Scale; EASE = Emotion Subscale of EAS; EASA=Activity Subscale of EAS; EASS = Sociability Subscale of EAS.

*$p < .05$.

**$p < .01$.

***$p < .001$.

Analysis of the Personality Variables

In the second stage of the analysis an initial series of ANOVAs were conducted to see if there were any significant gender differences for the personality variables since such a difference was found for the depression variables. No significant gender differences were found on these variables. Further ANOVAs were then used to assess the hypothesized relationships between the EAS Personality Scale and several of the other measures used in the study including the depression variable, the cognitive variables (self-esteem and self - consciousness), and the rate of unpleasant life events. This analysis was conducted because the hierarchical regression was not able to analyze the combined effects of personality on these other variables. Furthermore, the number of subjects in each group was too small to conduct a factorial analysis of variance. According to Buss and Plomin's 1984 temperament theory, depressed individuals should tend to score higher on the emotionality subscale when compared to the activity and sociability subscales. Furthermore, it was hypothesized that these depressed subjects would have a higher rate of unpleasant events, low self-esteem, and increased self-consciousness. The subjects were divided into groups derived from a median split procedure that was applied to the separate EAS subscales. This procedure involved dividing each of the subscales into two groups according to their median score. The median on the Emotionality subscale was 27 thus those scoring above 27 would be considered to have a high score while those scoring below 27 would be said to have a low score. Likewise, on the Activity and Sociability subscales the median was 13 therefore those subjects with a score above 13 were placed in the high group while those below 13 were in the low group. By using this splitting procedure eight groups were created that were used to further divide the subject's mean scores on a particular measure (CES-D, Self-Esteem, Self-Consciousness, or rate of unpleasant events).

Table 8 compares the CES-D mean scores for the various groups derived from the median split procedure of the EAS personality measure. In this case, particular attention is focused on the fifth group who are high on emotionality (have scores above the mean of 27) but low on activity and sociability (have scores below the mean of 13) since, as mentioned above, these individuals should theoretically be more depressed than the other groups (Buss and Plomin, 1984). An eight group one-way analysis of variance

was conducted. A Student Newman-Keuls test comparing the groups found that group 5, did differ significantly from the first four groups, but was not significantly different from the other groups where emotionality was high.

A Student Newman-Keuls test was then conducted to examine the differences between this group and the others in terms of their rate of stressful life events. Table 9 shows that this particular group (5), does differ significantly from some of the other groups where emotionality is low, however, they are not substantially different from other high emotionality groups.

Finally, a similar comparison was made between the fifth group and the other seven EAS personality groups on the basis of their scores on the self-esteem measure and the self -consciousness measure. Table 10 reveals that the fifth group, does have the highest mean amongst the groups, which is indicative of lower self-esteem. However, this group does not differ significantly from all the other groups and in particular, not from the other high groups (i.e., group 6 and 7).

Table 11 provides the results of the Student Newman Keuls test of the groups according to their mean scores on self-consciousness and indicates that once again the fifth group does have the highest mean, but is not statistically different from all the other groups on this construct.

Table 8

Comparison of Personality Groupings by Mean Depression Scores

Group			CES-D means
M	M	M	
1 Emotionality < 27	Activity < 13	Sociability < 13	7.03a
2 Emotionality < 27	Activity < 13	Sociability > 13	4.82a
3 Emotionality < 27	Activity > 13	Sociability > 13	6.50a
4 Emotionality < 27	Activity > 13	Sociability < 13	5.30a
5 Emotionality > 27	Activity < 13	Sociability < 13	13.77b
6 Emotionality > 27	Activity < 13	Sociability > 13	14.85b
7 Emotionality > 27	Activity > 13	Sociability < 13	13.28b
8 Emotionality > 27	Activity > 13	Sociability > 13	11.94b

Note. Means having the same subscripts are not significantly different at $p < .05$.

Table 9

Comparison of Personality Groupings by the Mean Rate of Stressful Life Events

Group			Rate means
M	M	M	
1 Emotionality < 27	Activity < 13	Sociability < 13	40.06$_a$
2 Emotionality < 27	Activity < 13	Sociability > 13	29.99$_b$
3 Emotionality < 27	Activity > 13	Sociability > 13	29.03$_b$
4 Emotionality < 27	Activity > 13	Sociability < 13	30.95$_b$
5 Emotionality > 27	Activity < 13	Sociability < 13	39.87$_a$
6 Emotionality > 27	Activity < 13	Sociability > 13	39.72$_a$
7 Emotionality > 27	Activity > 13	Sociability < 13	40.18$_a$
8 Emotionality > 27	Activity > 13	Sociability > 13	38.05$_a$

Note. Means having the same subscripts are not significantly different at $p < .05$.

Table 10

Comparison of Personality Groupings by Mean Self-Esteem Scores

	Group			Self-Esteem means
	M	M	M	
1	Emotionality < 27	Activity < 13	Sociability < 13	14.96$_a$
2	Emotionality < 27	Activity < 13	Sociability > 13	13.13$_a$
3	Emotionality < 27	Activity > 13	Sociability > 13	13.62$_a$
4	Emotionality < 27	Activity > 13	Sociability < 13	14.22$_a$
5	Emotionality > 27	Activity < 13	Sociability < 13	18.89$_b$
6	Emotionality > 27	Activity < 13	Sociability > 13	17.71$_b$
7	Emotionality > 27	Activity > 13	Sociability < 13	17.81$_b$
8	Emotionality > 27	Activity > 13	Sociability > 13	16.50$_c$

Note. Means having the same subscripts are not significantly different at $p < .05$.

Table 11

Comparison of Personality Groupings by Mean Self-Consciousness Scores

	Group			Self-Con. means
	M	M	M	
1	Emotionality < 27	Activity < 13	Sociability < 13	50.98$_a$
2	Emotionality < 27	Activity < 13	Sociability > 13	46.90$_b$
3	Emotionality < 27	Activity > 13	Sociability > 13	48.78$_b$
4	Emotionality < 27	Activity > 13	Sociability < 13	43.23$_b$
5	Emotionality > 27	Activity < 13	Sociability < 13	58.22$_c$
6	Emotionality > 27	Activity < 13	Sociability > 13	55.28$_c$
7	Emotionality > 27	Activity > 13	Sociability < 13	55.72$_c$
8	Emotionality > 27	Activity > 13	Sociability > 13	55.14$_c$

Note. Means having the same subscripts are not significantly different at $p < .05$.

Regression of the Cognitive Variables

Self-Esteem

As mentioned earlier, the third stage of analysis involved a hierarchical multiple regression where self-esteem was used as the dependent variable in order to see how predictive the other independent variables were of this cognitive variable. Table 12 shows the results of this analysis. Self-consciousness was not entered into the regression equation since it is at the same level as self-esteem in the model.

In the first step, the job variables, pleasant and unpleasant events variables, social support variable, personality variables, and demographic variables predicted 35% of the variance, F change$(8, 257) = 9.53$, $p < .001$. Within this step, the emotion scale of the EAS was the most significant predictor (.001) of self-esteem, while the rate of pleasant events, sociability scale of the EAS, age, and marital status predicted it to a lesser degree.

The second regression step involved the addition of the interaction variables which did not change the variance accounted for by the earlier step in the model. None of the interaction variables were significant predictors of self-esteem.

Table 12

Hierarchical Multiple Regression of Model Variables of Self-Esteem

Variables entered	Beta	R^2 Change	R^2 Total
Step 1			
Job Satisfaction Scale	**-.08**		
Job problem subscale	**-.02**		
Pleasant events: freq.	**-.11**		
Pleasant events: rate	**.15***		
Unpleasant events: freq.	**.12**		
Unpleasant events: rate	**-.02**		
Social Support Scale	**-.03**		
Emotion Scale of EAS	**.27*****		
Activity Scale of EAS	**.03**		
Sociability Scale of EAS	**.11***		
Sex	**.07**		
Age	**.14***		
Marital status	**-.12***		
Work status	**.06**		
Hrs worked per wk	**.01**		
Practice location	**-.06**		
Total for Step		**.35*****	**.35**
Step 2			
Job Satisfaction Scale	-.08		
Job problem subscale	-.00		
Pleasant events: freq.	-.10		
Pleasant events: rate	.12		
Unpleasant events: freq.	-.24		
Unpleasant events: rate	.41		
Social Support Scale	-.00		
Emotion Scale of EAS	.23		
Activity Scale of EAS	.01		
Sociability Scale of EAS	-.09		
Sex	.06		
Age	.11		
Marital status	-.15		
Work status	.05		
Hrs worked per wk	.00		
Practice location	-.07		

Variables entered	Beta	R^2 Change	R^2 Total
Step 2 continued			
Un.E. Freq. X EASE	**.46**		
Un.E. Freq. X EASA	**.39**		
Un.E. Freq. X EASS	**-.15**		
Un.E. Rate X EASE	**-.25**		
Un.E. Rate X EASA	**-.45**		
Un.E. Rate X EASS	**.21**		
Un.E. Freq. X Soc. Sup.	**-.16**		
Un.E. Rate X Soc. Sup.	**.02**		
Total for Step		**.00**	**.35**

Note. Bolded lines denote variables added to model at each step. Un.E.Freq.= Unpleasant Events Schedule: Frequency; Un.E.Rate = Unpleasant Events Schedule:Rate; Soc. Sup.= Social Support Scale; EASE = Emotion Subscale of EAS; EASA=Activity Subscale of EAS; EASS = Sociability Subscale of EAS.

*$p < .05$.

**$p < .01$.

***$p < .001$.

Self-Consciousness

Table 13 provides the results of the hierarchical multiple regression that was performed using self - consciousness as the dependent variable. As with the previous regression, the alternate cognitive variable (self-esteem) was not entered into the equation due to its assumed predictability in the model.

Step one involved the entrance of the job variables, pleasant and unpleasant events variables, social support variable, personality variables, and demographic variables. These variables combined predicted 32% of the variance, F change$(8, 257) = 8.36$, $p < .001$. The emotion scale of the EAS was the most significant predictor (.001) of self-consciousness followed by age (.01) and the rate of pleasant events (.05).

In the second regression step the interaction variables were added which resulted in a decrease of (1%) in the amount of variance explained. No significant variables were evident during this step.

Table 13

Hierarchical Multiple Regression of Model Variables of Self-Consciousness

Variables entered	Beta	R^2 Change	R^2 Total
Step 1			
Job Satisfaction Scale	**.05**		
Job problem subscale	**.06**		
Pleasant events: freq.	**-.13**		
Pleasant events: rate	**.12***		
Unpleasant events: freq.	**.12**		
Unpleasant events: rate	**.10**		
Social Support Scale	**-.08**		
Emotion Scale of EAS	**.21*****		
Activity Scale of EAS	**-.07**		
Sociability Scale of EAS	**.04**		
Sex	**.03**		
Age	**.20****		
Marital status	**-.08**		
Work status	**-.09**		
Hrs worked per wk	**.05**		
Practice location	**-.04**		
Total for Step		**.32*****	**.32**
Step 2			
Job Satisfaction Scale	.03		
Job problem subscale	.06		
Pleasant events: freq.	-.13		
Pleasant events: rate	.10		
Unpleasant events: freq.	-.10		
Unpleasant events: rate	.42		
Social Support Scale	-.30		
Emotion Scale of EAS	.28		
Activity Scale of EAS	.07		
Sociability Scale of EAS	.30		
Sex	.03		
Age	.18		
Marital status	-.10		
Work status	.07		
Hrs worked per wk	.04		
Practice location	-.05		

Variables entered	Beta	R^2 Change	R^2 Total
Step 2 continued			
Un.E. Freq. X EASE	**.01**		
Un.E. Freq. X EASA	**.27**		
Un.E. Freq. X EASS	**-.09**		
Un.E. Rate X EASE	**-.03**		
Un.E. Rate X EASA	**-.26**		
Un.E. Rate X EASS	**-.47**		
Un.E. Freq. X Soc. Sup.	**.03**		
Un.E. Rate X Soc. Sup.	**.46**		
Total for Step		**-.01**	**.31**

Note. Bolded lines denote variables added to model at each step. Un.E.Freq.= Unpleasant Events Schedule: Frequency; Un.E.Rate = Unpleasant Events Schedule:Rate; Soc. Sup.= Social Support Scale; EASE = Emotion Subscale of EAS; EASA=Activity Subscale of EAS; EASS = Sociability Subscale of EAS.

*$p < .05$.

**$p < .01$.

***$p < .001$.

Most Significant Variables

Table 14 illustrates the final stage of analysis where a post hoc hierarchical multiple regression was performed on the most significant model variables that were found to predict depression in the earlier regression analyses. It should be noted that not all the variables that were significant in the original hierarchical regression (i.e., self-consciousness) maintained their predictability by the end of the regression. Only those that did remain significant are shown here.

In the first step, entering the self-esteem variable accounted for 26% of the variance and was significant at the .001 level. Addition of the frequency of pleasant events, the frequency of unpleasant events, social support, and the emotion scale of the EAS at step 2 explained a further 25% of the variance for a total of 51% explained by all five of these variables.

Figure 4 presents a revised version of the theoretical model examining the correlates of depression for dentists. This revised model is based on the results of the hierarchical regression analyses and incorporates those variables which explained the largest proportion of variance in the analyses. When compared to the original model (Figure 1) it is apparent that many of the variables initially proposed to be correlates of depression (e.g., job satisfaction factors) did not withstand the testing of this theoretical model.

Table 14

Hierarchical Multiple Regression of Most Significant Model Variables

Variables entered	Beta	R^2 change	R^2 total
Step 1			
Self-esteem Scale	**.51*** **	**.26*** **	**.26**
Step 2			
Self-esteem Scale	.18**		
Pleasant events: Frequency	**-.21*** **	**.06*** **	**.32**
Unpleasant events: Frequency	**.24*** **	**.12*** **	**.44**
Social Support Scale	**-.23*** **	**.03*** **	**.47**
Emotion Scale of EAS	**.21*** **	**.04*** **	**.51**

Note. Bolded lines denote variables added to model at this step.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

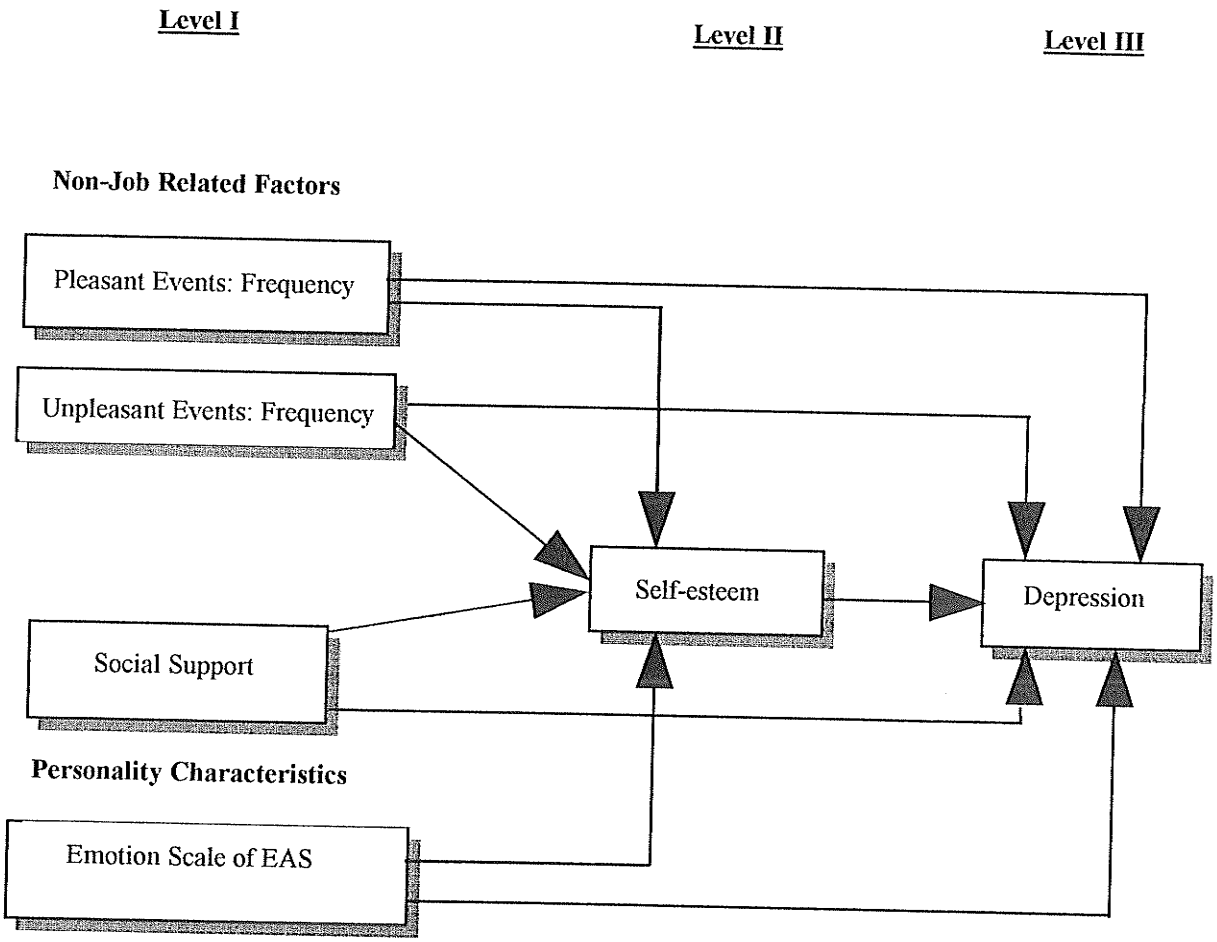


Figure 4. Revised theoretical model for the study

DISCUSSION

The objectives of the present study were twofold. First, the research examined the prevalence of depressive symptomatology in a sample of Canadian dentists. Previous research has evaluated the adverse effects of work related stress in the dental profession but has made little attempt to examine the area of depression per se. In particular, there has been no research conducted to empirically substantiate the claims that dentistry is a high stress profession characterized by a high incidence of depression. Furthermore, there have been no comparisons made of depression levels in dentists to those of the general population. Results of the study suggest that the dentists prevalence rate of depression was slightly higher than the rate found in Winnipeg community samples (by Barnes et al., 1988). In particular, it was found that the male dentists mean depression scores were higher than a comparable high SES group from the Winnipeg general population.

Second, the study tested a model predictive of depressive symptoms in dentists that was developed from a model first proposed by Lewinsohn, Hoberman, Teri, and Hautzinger (1985). Preliminary support for this proposed depression model was obtained. The major findings relevant to each of the proposed hypotheses will be discussed first in relation to the current literature. Following this will be an examination of more general issues raised by the results, as well as the implications for further research in this area.

Evaluation of the Research Hypotheses and Implications of Findings

Hypothesis 1. The first hypothesis stated that female dentists should be significantly more depressed than male dentists. The results show that the female dentists did not have a significantly higher level of depression than the male dentists. Furthermore, gender did not contribute significantly to the initial multiple regression equation. This may have been due to the fact that gender was highly correlated with other variables. This lack of a significant sex difference is somewhat surprising given that the majority of depression studies show that women consistently score higher than men on depression measures (Boyd

and Weissman, 1981). This significant sex difference is also commonly found when the CES-D is employed, although the precise interpretation of this finding is unclear. In one study examining the effects of sex on CES-D scores, Clark et al. (1981) concluded that it is difficult to determine if this difference constitutes a real difference in symptoms or a measurement bias. Barnes et al., (1988) also found that no significant sex differences existed when they examined the prevalence rate of depression in a Canadian urban sample. These authors suggest that sample differences in some studies (e.g., Barnes & Prosen, 1984) may account for previous significant findings. Furthermore, they note that sex differences in depression may be a disappearing phenomenon as suggested by some epidemiological research (e.g., Klerman et al., 1985). In particular, research by Hagnell et al (1982) suggests that the decline in sex differences appears to be related to increasing depression rates for men rather than decreasing rates for women. In the present study, the rather small number of females (38) when compared to the males (265), is one possible reason why a significant sex difference was not found among the dentists.

Hypothesis 2. It was predicted that younger dentists should be more depressed than older dentists. Based on recent epidemiological studies (Barnes et al., 1988; Klerman et al., 1985; Weissman et al., 1984) it has been found that younger subjects commonly have a higher prevalence of depression when compared to older subjects of the same sample. Furthermore, research suggests that the prevalence of depression increases during adolescence and seems to peak between the ages of 20 and 40 (Lewinsohn, Hautzinger, & Duncan, 1984). Past the age of 40 the prevalence appears to stabilize and, according to some researchers (e.g., Comstock & Helsing, 1976; Hirshfield & Cross, 1982; Teri & Lewinsohn, 1981) decreases somewhat, suggesting a curvilinear relationship between age and depression.

According to the results, the younger dentists were not significantly more depressed than the older ones, although the mean depression scores (see Figure 3) for the under 30 and 30-39 year old groups were higher than the older groups, providing some support for the curvilinear hypothesis.

Hypothesis 3. It was predicted that dentists would be more depressed than comparable members of the general population. Overall, the dentists did have a prevalence rate of depression that was higher (20%) than the WAS general population sample (17%) reported by Barnes et al., 1988, although this result was not statistically significant. Furthermore, this finding falls within the 15-21% range for prevalence rates

of depression found in previous studies utilizing the CES-D (see Barnes et al., 1988). As well, this prevalence rate is comparable to the dental survey results of Dunlap and Stewart (1982) who found that 20% of the dentists "felt depressed" although no specific measure of depression was used. Similarly, Rankin and Harris (1990a) reported that 23% of their sample of dentists were experiencing depression. Once again, however, the study lacked a standardized measure of depression and instead utilized a few questions related to it as part of an overall "source of stress" questionnaire.

The only study that was found to provide some comparison between dentists and the general population on depressive symptoms was conducted by Cooper, Watts, and Kelly (1987). These researchers found that male dentists had significantly higher scores on four mental ill-health indicators (free-floating anxiety, phobic anxiety, depression, and hysterical anxiety) when compared to a normative population drawn from a random sampling of two large group general medical practices. While these results would tend to support the findings of the current study it should be noted that the depression scale was only a subscale of a larger mental health questionnaire (the Crown-Crisp Experiential Index) and that comparison population did not appear to be matched to the sample of dentists in terms of income, education, etc.

One of the most important results of the current study was the finding that the male dentists were significantly more depressed than males (high SES group) with a similar income and education from the general population. As mentioned earlier, the small female sample size may account for the lack of significant findings in the comparison between the female dentists and their general population counterparts. As well, attempts were made to try and include more socio-demographic variables (e.g., occupation, employment status) in specifying the high SES group but the number of subjects who met the criteria was too small to allow meaningful statistical comparisons.

What is particularly noteworthy about this result is that high SES status typically tends to "buffer" individuals against depression. In their review of the epidemiology of affective disorders, Hirshfield and Cross (1982) note that the rates of depressive symptoms are significantly higher in persons of lower SES than in persons of higher SES, regardless of whether SES is defined by occupational, income, or educational level or any combination of these. Barnes et al., (1988) indicate that lower depression scores

have generally been found among individuals who have post-secondary education and are employed in professional occupations when compared to other groups in the general population. It therefore appears that despite the fact that dentistry is a high SES profession it does not seem to confer the same "protection" against depressive symptoms that other high SES professions have. It is unclear why this is the case, although it does not appear to be simply profession related per se. If this were true, one might expect those dentists who had been in the profession longer to be experiencing more depressive symptoms. As discussed in hypothesis 2, age was not a significant predictor of depression, thus disputing the notion that it is only the practice of dentistry that makes dentists more depressed than the general population.

Hypothesis 4. This hypothesis stated that there should be a direct relationship between depression and the frequency and intensity or rate of unpleasant life events that the dentist had experienced in the past month. This hypothesis was fully confirmed, as depression was significantly related to the frequency and the intensity of unpleasant life events. Wierzbicki and Rexford (1989) had similar findings in their examination of cognitive and behavioral correlates of depression in clinical and non clinical populations. According to their study, which utilized the same measure of unpleasant events as the current study, depression was correlated significantly and positively with depressogenic cognitions and with the frequency and unpleasantness (intensity) of unpleasant events. Similar findings were reported by Lewinsohn, Hoberman and Rosenbaum (1988) in their study of risk factors for unipolar depression. As well, Wilkinson (1993), found that unpleasant event frequency and intensity were significantly related to depression. The results of this study, therefore, appear to support the contention that unpleasant life events play an important role in the development and maintenance of depression.

Hypothesis 5. It was postulated that depression would be inversely related to the frequency and intensity of pleasant events that the dentist had experienced in the past month. This hypothesis was not completely supported, as depression was significantly inversely related to the frequency, but not the intensity of pleasant events. It should be noted, however, that the correlation was in the expected direction (negative) for the intensity ($r=-.12$) but did not reach significance. Similarly, Wilkinson (1993), in his examination of Staats and Heiby's (1985) theory of depression, found that the frequency of pleasant

events was inversely related to depression level independent of the hedonic strength (intensity) associated with such events.

Hypothesis 6. It was predicted that depression would be inversely related to the level of social support that the dentist received. According to the results, social support was significantly inversely related to depression. As discussed in the introduction, the association between poor social supports and depression has been known for many years (e.g., Paykel et al., 1969). Recent research into the concept of social support has identified it as a central variable in coping with critical life events and everyday stress, as well as a predictor of adjustment and psychological health (Lin et al., 1979; Quast & Schwarzer, 1984).

Within the dental literature social support has also been examined. Nevin and Sampson (1986) studied the stressors that 28 dentists and their spouses experienced and found that, despite a significant number of stressors arising from both the dental practice and the family, those couples who demonstrated strong family coping skills and family resources experienced little negative impact from the stressors. As well, Dunlap and Stewart (1982) found in their large survey of dentists that the amount of stress experienced by a dentist was significantly reduced as more people became involved in a dental practice, thus increasing the amount of social support available to the members. Unfortunately, neither study examined the relationship between social support and depression, which would have provided further comparisons to the results of the present study.

Hypothesis 7. This hypothesis stated that there should be an inverse relationship between the dentists' level of depression and their level of self-esteem. As discussed in the results, this hypothesis was found to be true. Numerous studies provide evidence that depressed persons score significantly lower than nondepressed individuals on a variety of measures of self-esteem (e.g., Altman & Wittenborn, 1980; Beck, 1974; Lewinsohn, Larson & Munoz, 1982). Negative view of the self is a central part of the cognitive theory of depression proposed by Beck in 1967. Measurement of self-esteem provides a direct assessment of this aspect of the cognitive theory. As well, low self-esteem plays a central role in the reformulation (Abramson et al., 1978) of Seligman's (1972) learned helplessness model of depression. This theory states that if a person explains a bad event by an internal factor then self-esteem loss is more likely to occur.

Hypothesis 8. It was proposed that depression should be directly related to self-consciousness. The findings of the study indicate that there was a direct correlation between depression and self-consciousness. Like social support and self-esteem, many studies have been conducted examining the relationship between depression and self-consciousness or self-awareness. For example, Pyszczynski and Greenberg (1987) found that depressed individuals engaged in significantly more self-focused attention than nondepressives following a task failure. Hoberman and Lewinsohn (1985) indicate that an important consequence of heightened self-awareness is an intensification or magnification of negative affective responsiveness. Furthermore, as discussed in the introduction, high self-consciousness and depression have been found to be significantly correlated in samples of clinically depressed adults (Ingram et al., 1989) and college students (e.g., Ingram & Smith, 1984).

Hypothesis 9. The ninth hypothesis stated that depression would be inversely related to job satisfaction. As reported in the results, job satisfaction was inversely related to depression in a significant fashion. This finding is not surprising since one of the common features of clinical depression is a loss of interest in one's work and/or leisure activities. Furthermore, the job problem subscale (DPROB) was significantly directly related to depression, suggesting that as job problems (e.g., fatigue, time pressures, physical strain) increased, so did the amount of depression that the dentist was experiencing. Despite numerous articles in the dental literature relating the causes of stress in dentistry and job satisfaction (e.g., Cooper et al., 1987; Howard et al., 1976; Shugars et al., 1990), none have looked at the relationship between depression and job satisfaction per se. Some articles (e.g., Dunlap & Stewart, 1982; Rankin & Harris, 1990a), as was discussed earlier related to hypothesis 3, have reported the percentage of dentists that have felt depressed or dissatisfied with their work as a consequence of job stress, but in these cases depression is assessed in a global way with a number of other health problems.

Hypothesis 10. This hypothesis postulated that job satisfaction would be directly related to self-esteem and inversely related to self -consciousness. Due to the fact that positive correlations with self-esteem are really negative correlations (since on the self-esteem scale a low score indicates high self-esteem), the results indicated that job satisfaction was significantly (.001) and directly related to self-esteem and inversely related to self-consciousness in a significant way.

Kaldenberg and Becker (1991) examined the relationship between job satisfaction, self-esteem, and performance among dentists in an attempt to test the Korman hypothesis. This hypothesis (Korman, 1970) stated that performance and job satisfaction are positively related for individuals with high self-esteem and unrelated for those with low self-esteem. Kaldenberg and Becker sampled 600 Oregon dentists and received 416 (69.3%) usable questionnaires. Included in their questionnaire was the Rosenberg self-esteem scale and questions assessing performance (e.g., number of patients seen per day, gross income, etc.), and job satisfaction. They found that a significant positive relationship existed between high self-esteem and job satisfaction ($r=.24$, $p< .001$.) and a positive, but not significant, relationship between low self-esteem and job dissatisfaction. Forrest (1978) has also discussed the connection between low self-esteem and job dissatisfaction within the dental profession.

As far as the relationship between job satisfaction and self-consciousness is concerned, no articles discussing this exact relationship could be found. However, research has indicated that increased self-consciousness correlates positively with increased self criticism (Ickes et al., 1973) and anxiety (Schwarzer, 1984). Within the dental literature, several of the articles examining job satisfaction found that perfectionism (e.g., Dunlap & Stewart, 1982; Wilson, 1984), which certainly involves self criticism, was a highly reported problem related to job dissatisfaction, as was anxiety (e.g., Owen, 1982). Thus, it would appear that the findings of the present study do correspond with the current literature.

Hypothesis 11. It was predicted that there would be a direct relationship between pleasant life events and self-esteem, while an inverse relationship would exist between such events and self-consciousness. The findings of the study revealed that pleasant events (both the frequency and intensity) were directly related to self-esteem, but only the frequency of pleasant events was significantly and inversely related to self-consciousness, although the intensity was in the predicted (negative) direction. Thus, the hypothesis was only partially supported. Although no research could be found examining the exact correlations of pleasant events and self-esteem, much has been written about the relationship between low self-esteem and depression and how a lack of response contingent positive reinforcement i.e., pleasant events (e.g., Lewinsohn & Graf, 1973, Lewinsohn & Amenson, 1978) correlates with depression. Based on these

studies and articles it is not surprising to find that individuals with high self-esteem engage in more pleasant activities and experience more pleasant life events.

The research related to self-consciousness (e.g., Carver et al., 1979) indicates that increased self-awareness has been shown to be associated with behavioral withdrawal. Such withdrawal would limit an individual's chance to engage in pleasant events. Therefore, it would be anticipated that as self-consciousness increases, pleasant events would decrease.

Hypothesis 12. This hypothesis held that unpleasant life events would be inversely related to self-esteem, and directly related to self-consciousness. The results indicate that the frequency and intensity of unpleasant events were inversely related to self-esteem but that only the frequency of these events reached a significant level of interaction. The intensity correlation was, however, in the expected negative direction. It was also found that the frequency and intensity of unpleasant events was significantly (.001 level) and directly related to self-consciousness. As was the case with hypothesis 11, this hypothesis was only partially supported. Furthermore, given that this hypothesis is the opposite version of hypothesis 11, one would expect the reverse correlations to be true. Lewinsohn et al., (1985) also indicate that an increase in negative experience or reduction in positive reinforcement will result in an increment in self-awareness.

Hypothesis 13. It was postulated that social support should be directly related to self-esteem and inversely related to self-consciousness. An examination of the relationship between these variables revealed that social support was indeed directly related to self-esteem and inversely related to self-consciousness, and that both these findings were significant. Quast and Schwarzer (1984), indicate that a positive relationship should exist between social support and self-esteem, since strong social supports provide a positive input to well-being and to self-esteem by giving pleasure and stimulation to the individual. The outcomes of this interaction are increased satisfaction and quality of life and less boredom, loneliness, and depression.

As far as the relationship between social support and self-consciousness is concerned, it has already been mentioned that increased self-consciousness leads to behavioral withdrawal (Carver et al., 1979) that would reduce an individual's likelihood of receiving social support. As well, increased self-awareness has

been associated with social difficulties (Christensen, 1982; Fenigstein, 1979) by reducing a person's social competence and in turn creating a negative impact on others (Coyne, 1976a; Hammen & Peters, 1978). Research by Jacobson and Anderson (1982) suggests that depressed people are often preoccupied with themselves and make self-referent comments even in social conversation, presumably due to their increased self-consciousness. This increased self-focus in social interactions can lead to social rejection (Strack & Coyne, 1983), thus reducing the available social supports that otherwise might have been there.

Hypothesis 14. This hypothesis postulated that dentists with more social support should experience a lower frequency and intensity of unpleasant life events. Examination of the correlations between these variables indicated that the frequency but not the intensity of unpleasant events was negatively correlated with social support. Therefore, this hypothesis was not completely supported. As was found with some of the other hypotheses, however, the relationship between the variables was in the predicted direction.

A substantial part of the research in the area of social support has focused on how it reduces, moderates or buffers the impact of negative life events or stressors, i.e., is a main effect or interaction (moderator) effect occurring (Sutherland & Cooper, 1990). Several studies have provided evidence for the interaction effect model by showing that social support attenuates the relationship between depressed mood and unpleasant life events among both community based samples (e.g., Billings & Moos, 1981; Wilcox, 1981) and clinically depressed respondents (e.g., Brown, 1979). Other researchers (e.g., Sutherland & Cooper, 1990; Quast & Schwarzer, 1984), however, suggest that the evidence for social support impact seems to posit a main or direct effect model, with moderating effects having a modest, highly selective impact. Based on the pattern of intercorrelations between social support and depression found in this study, the main effect model would tend to supported.

Hypothesis 15. It was predicted that dentists who scored high on emotionality but low on activity and sociability according to Buss and Plomin's EAS Temperament Survey would be more depressed than those dentists who scored differently on these personality dimensions. In the results, a comparison was made of the CES-D mean scores for all the groups that could be derived according to the various combinations of the EAS personality measure (see Table 8). In this case, concern was focused on the fifth group who were high on emotionality (had scores above the mean of 27) but low on activity and sociability (had scores

below the mean of 13). A Student Newman-Keuls test of these groups found that group 5 did differ significantly from the first four groups, (at the .05 level), but that this group was not significantly different from the other groups where emotionality was high. Therefore, this hypothesis was not confirmed. It would appear from these results that high emotionality is the important variable correlating with depression and that activity and sociability do not play much of a role in determining the connections between the dentist's temperament and depression. This fact was confirmed by the multiple regression analysis (see Table 14 and Figure 4) which indicates that it is the emotionality subscale that is a significant predictor of depression according to the proposed model. It is interesting to note that Buss and Plomin's (1984) emotionality variable is highly related to Eysenck's concept of neuroticism (1967), which has been shown to be associated with depression, and anxiety (Sutherland & Cooper, 1990). According to Klein et al.'s (1993) integrated model of personality-depression relationships, neuroticism is the main temperament variable associated with the development of a depressive disorder.

Hypothesis 16. This hypothesis held that dentists who had high scores on emotionality but low scores on activity and sociability would experience a higher rate or intensity of stressful life events than dentists with other trait combinations. Results show that this particular group (5) did differ significantly from some of the other groups where emotionality was low; however, they were not substantially different from other high emotionality groups. Thus, this hypothesis was not supported. Again, these results suggest that emotionality is the important temperament variable irrespective of the activity and sociability variables.

Hypothesis 17. The final hypothesis proposed that dentists who had high emotionality scores but low activity and sociability scores would have lower self-esteem and higher self -consciousness than dentists with different combinations of these traits. Examination of the Student Newman-Keuls test for these variables when compared on self-esteem revealed that the group in question (group 5) did have the highest mean amongst the groups, which was indicative of lower self-esteem. However, this group did not differ significantly from all the other groups and in particular, not from the other high emotionality groups (i.e., group 6 and 7). A similar comparison of the groups according to their mean scores on self-consciousness indicated that, once again, the fifth group did have the highest mean, but was not statistically different

from all the other groups on this dimension. As such, this hypothesis was not supported. Given that the previous two hypotheses derived from the depression model were not supported, it is not surprising to find that this final hypothesis was not confirmed either. However, it is once again apparent that the individual's high scores on the emotionality variable, regardless of scores on the other two temperament variables are the most important temperament to be considered when predicting depression and related constructs. It is also interesting to note that emotionality significantly negatively correlates with self-esteem and significantly positively correlates with self-consciousness (see Table 6), as would be predicted by the model, whereas the activity and sociability subscales did not correlate significantly with either self-esteem or self-consciousness.

Evaluation of the Model and Implications of Findings

As indicated in the previous discussion, many of the hypotheses generated by the depression model (see Figure 1) were found to be true. This is important, of course, in terms of supporting the validity of the model, but also because it lends credence to the claims that dentistry is a stressful profession characterized by high levels of depression (e.g., Hendrix, 1986; Lang-Runtz, 1984; Owen, 1982). In particular, the finding that the male dentists (and likely the females dentists as mentioned earlier) were significantly more depressed than their general population counterparts raised the issue of what makes a "high SES" group like dentists more prone to depression, when high SES is generally considered a buffer against such symptoms? In order to consider this question, an examination of the hierarchical regression analyses and the resulting depression model (see figure 4) is required.

As shown in Table 7, several of the independent variables that correlated individually with depression also accounted for some proportion of the variance predicted by the model in the regression analysis. These variables included self-consciousness, self-esteem, the frequency of pleasant and unpleasant events, social support (all these were significant at the .001 level), job satisfaction (significant at .01), the intensity or rate of pleasant events, the emotionality subscale of the EAS, and age (significant at .05). When these particular variables were further analyzed, however, only those found in Table 14 remained

predictive of depression. Thus, self-consciousness, job satisfaction, the rate of pleasant events and age all dropped out of the model at this point.

The revised depression model suggests that it is a combination of the non-job related factors (a low frequency of pleasant events, a high frequency of unpleasant events, and low social support) and the dentist's high emotionality that lead to a reduction in self-esteem and subsequently to symptoms of depression among the dentists. These results are interesting for a number of reasons. First, it is quite important to note that the job related factors (i.e., job satisfaction) did not remain in the model, since many of the studies in the dental literature identify these as being the critical factors leading to increased job stress and possibly depression among dentists. For example, Cooper et al., (1987) using multiple regression analysis, observed that overall mental well-being in a sample of 484 dentists was predicted by five job stressor factors which included time and scheduling pressures, pay-related stressors, patient's unfavorable perception of dentists, staff and technical problems, and problems dealing with patients. Howard et al. (1976) also found that decreased job satisfaction was highly related to stress in a sample of Canadian dentists.

It is possible that what is being observed in the present study is a form of cognitive dissonance (Festinger, 1957). Dissonance is caused when an individual is confronted with two discrepant beliefs or ideas, both of which they believe are true. People will naturally try to reduce this dissonance in whatever way possible. In this case, dentists who are reporting symptoms of depression may attribute these symptoms to factors outside of the work setting, since blaming them directly on job related factors would be inconsistent with their choice to work and stay working in the field of dentistry.

It may also be possible that a dentist's work related duties are indirectly influencing the non-job related factors that in turn may lower self-esteem and result in depression. For example, working long hours or taking few holidays could reduce the possibility of the dentist taking part in pleasant events, increase unpleasant events such as arguments with the spouse, or decrease the opportunity for social support with peers or friends. This is purely speculative, of course, although the significant positive correlations (as shown in Table 6) between job satisfaction, frequency of pleasant events, and social support as well as the

significant inverse relationship between job satisfaction and the frequency of unpleasant events would suggest this might be true.

Thus, it appears that both the non-job related, and possibly the job related factors, may be part of the explanation of why the dentist's SES status is not inhibiting the development of depression.

A second interesting finding in the revised model is that the emotion personality variable remained as a significant predictor of depression despite the fact that none of the individual hypotheses related to the temperament scale as a whole were confirmed. As pointed out, however, it would appear that emotionality, because of its close similarities to Eysenck's (1967) concept of neuroticism, would be expected to correlate with depression. Costa and McCrae (1985) suggest that persons who are characterized by high levels of neuroticism tend to be depressed, easily frustrated, and unable to deal with stress.

This finding is also important because it raises the issue of what kind of person enters the dental profession and the possible risks involved with this type of personality. As Unger (1990) suggests, dental students, as well as medical students, tend to be high achievers, meticulous, and perfectionistic. While these characteristics often result in high grades, and good quality work, they also tend to predispose these individuals to an "acute stress syndrome". Similarly, research examining the personalities of medical students in the United States suggests that 20% have obsessive compulsive personalities (Lloyd & Gartrell, 1984) and that this type of "vulnerable" personality is attracted to medicine (Waring, 1974), this suggests that the basic reason why these individuals experience stress related difficulties predates any work associated stress (Vaillant et al., 1972).

In support of Unger's observations, several researchers (e.g., Cooper, 1980; Forrest, 1978; Katz, 1986), have explicitly examined the personality characteristics of dentists and have generally found that a large number of them are anxiety prone, easily upset (e.g., emotionally unstable), and perfectionistic. Furthermore, they report more stress related problems, symptoms of depression, and less job satisfaction. Interestingly, when asked to comment about what they felt were the causes of job stress in dentistry, several of the respondents in this study identified their "high achiever" qualities, and the ability to perform their technical skills to the level that they expect as significant sources of stress.

The results of the present study tend to support the findings that the dentists personality characteristics do play a significant role in the stress and depression that they are experiencing, and by doing so may further explain why the dentists SES is not sufficiently buffering them from the development of these depressive symptoms.

A third important finding based on the revised model is that the self-consciousness variable did not remain as a significant predictor of depression despite the fact that it did significantly correlate with depression and several of the other independent variables as discussed in the hypotheses. This is particularly interesting because of the important role attributed to self-consciousness in the development of depression both in this model and that of Lewinsohn et al., (1985). Instead, low self-esteem is the sole cognitive factor that appears to be influenced by the factors at Level I, leading to the development of depressive symptoms at Level III.

Klein et al. (1993) indicate that one of the advantages of the diathesis-stress models like that presented in this study is that they attempt to integrate many variables and multiple determinants in their explanation of depression. Furthermore, they provide generous latitude for individual variations in vulnerabilities and/or strengths which can impact on the development of depressive symptoms. Klein and her colleagues note, however, that although these models appear straightforward and plausible in theory, they are complex and difficult to test in practice. For example, when key intervening variables (e.g., cognitive variables) involve subjective constructs such as appraisals or perceptions it can become difficult to distinguish between sets of variables that play different functional roles in the model. Thus, one possible explanation why self-consciousness did not remain as a key predictor is because of its close affiliation to self-esteem as a cognitive variable in the model.

In summary, the results of the study suggest that male dentists do demonstrate more depressive symptoms than comparable members of the general population. It is not certain why this is the case, but the proposed model seems useful in explaining how various non-job related variables, along with a particular personality characteristic, may influence a dentist's cognitive self statements (i.e., self-esteem) in such a manner that the result is the development of these depressive symptoms.

The implications of these findings are twofold. First, a referral/counseling service should be developed, if it does not already exist, for dentists who are currently having difficulties with depression. Second, practicing dentists should be encouraged to participate in stress management courses through their professional inservice programs that would be specifically developed to deal with the kinds of stressors associated with the practice of dentistry. On a related issue, efforts should be made to reach dentists before they begin practice through preventive education and intervention with students in the dental schools.

Directions for Future Research

One limitation of the present study involves the comparison of the study sample to that of the 1983 WAS sample. Although the two samples are comparable in terms of the demographic characteristics of the subjects there is a difficulty regarding the lack of comparison of recent life stressors that the subjects experienced. Such stressors were not examined in the WAS, so it is difficult to assess the influence that they may have had on the development of the individual's depressive symptoms. Such data would have been useful in terms of allowing a more extensive comparison of the two groups with regard to the possible antecedents of depression.

Another issue regarding this comparison that should be addressed has to do with the influence of social desirability on the results of the present study. In particular, the comparison between the 1983 WAS depression scores and the dentists depression scores may have been subject to this effect. WAS data was gathered through an in-home interview which may increase subject participation but decrease depression scores because the respondents may have tried to cast themselves in the "best light" possible by admitting to fewer depressive symptoms. For self report mailout surveys participation rates may be lower (although an adequate 60% response rate was obtained in this study) but reported depression scores may be higher because of the relative anonymity of the respondents. Therefore, some caution should be used when comparing the mean depression scores of these two groups.

On a related note, it may be possible that the higher depression scores found in this study were a function of time since these scores were gathered in 1991 while the WAS data was obtained in 1983. Epidemiological research (e.g., Klerman et al., 1985) suggests that there is a progressive increase in rates of depression in successive birth cohorts through the 20th century. These findings would once again suggest that some caution be used when making comparisons between data sets gathered eight years apart.

Another limitation of the study is the lack of generalizability of the findings to other professional groups. It would be helpful if comparisons could be made on the various predictors found to be significant in the model. For example, are dentists experiencing less job satisfaction or a higher frequency of unpleasant events than pharmacists? Such comparisons might help further explain why the dentist's SES status does not appear to be buffering them against the development of depressive symptoms as it does for other professionals. Unfortunately, no comparison samples for the various predictors could be found.

Some research, however, does allow for comparison with regard to the dentists rate of depression. Several studies (e.g., Gallery et al. 1991; Hsu & Marshall, 1987; Rosch & Woods, 1987) have examined the stress factors in medicine and have provided prevalence rates of depression in this group of professionals. These studies suggest that while the dentists in the present study had a prevalence rate (19%) of depression that was equivalent to that of a group of American emergency physicians (Gallery et al, 1991), it was somewhat lower than the rate (23%) reported in an Ontario sample of residents, interns, and fellows by Hsu and Marshall (1987). Further comparisons involving other professional groups and the hypothesized antecedents of depression would undoubtedly prove useful in determining if and why dentists suffer from depression more than other professionals.

The results of this study also suggest that further research specifically examining depression among female dentists may be warranted. As previously noted, a significant sex difference was not found in this study, nor were the females dentists more depressed than their comparable high SES group from the general population. These results are interesting since research examining depression among professional women (e.g., McGrath et al., 1990) suggests that this group have a higher incidence of depression and suicide than women in the general population. As explained earlier however, the lack of significant findings in the present study was probably due to a small female sample size.

The research on professional women and depression suggests that despite the advantages of professional status, career women appear to struggle with a variety of conflicts and stressors that may increase their risk for depression. For example, professional women may have difficulty reconciling their achievement and affiliation needs and responsibilities. As well, they may be discriminated against or sexually harassed by men who feel threatened by a women's competence. Furthermore, professional status may jeopardize marital prospects since marital norms mandate that a woman's status be inferior to that of her husband's (McGrath et al., 1990). Moreover, these authors suggest that professional women often have two "jobs" since women commonly maintain the majority of responsibility for child care and housework even among dual-career families. It is apparent from these findings that further empirical research is needed to delineate the stressors, psychological factors, interpersonal conflicts and other negative life events that increase the risk of clinical depression in professional women.

In terms of the organization of the survey in the present study, some changes may be warranted in future research. In particular, the use of the EAS Temperament Survey is questioned because of its lack of use in empirical research. Perhaps, if a more widely known measure such as the Eysenck Personality Inventory (Eysenck & Eysenck 1969) or the 16 Personality Factors (16PF) Questionnaire (Cattell, Eber, & Tatsuoka, 1970) had been utilized, more information about how a dentist's personality correlates with other stress causing and stress reducing variables as well as depression might have been obtained. However, as noted in the introduction, the EAS Scale was chosen because it was less likely to overlap with depression to the same degree that some of these other measures have been found to in previous research.

REFERENCES

Abramson, L.Y., Seligman, M.E.P., & Teasdale, J.D. (1978). Learned helplessness in humans: Critique and reformulation. Journal of Abnormal Psychology, 87, 49-74.

Allgood-Merten, B., Lewinsohn, P. M., & Hops, H. (1990). Sex differences and adolescent depression. Journal of Abnormal Psychology, 99, 55-63.

Alloy, L.B., & Abramson, L.Y. (1979). Judgment of contingency in depressed students: Sadder but wiser? Journal of Experimental Psychology, 108, 441-485.

Amenson, C.S., & Lewinsohn, P.M. (1981). An investigation into the observed sex difference in prevalence of unipolar depression. Journal of Psychology, 90, 1-13.

Ashford, N.A. (1977). The nature and dimension of occupational health and safety problems. Personal Administrator, 26, 46-48.

Ayer, W.A., & Moretti, R. (1985). Stress in Dentistry: Where's the evidence? Journal of the American Dental Association, 110, 22.

Barnes, G.E., Currie, R.F., & Segall, A. (1988). Symptoms of depression in a Canadian urban sample. Canadian Journal of Psychiatry, 33, 386-393.

Barnes, G.E., & Prosen, H. (1984). Depression in Canadian general practice attenders. Canadian Journal of Psychiatry, 29, 2-10.

Barnes, G.E., Weinstein, C.L., Delaney, G.A., & Dubo, H.I.C. (in press). Symptoms of depression and spinal cord injury.

Barnett, D.A., & Gotlib, I.H. (1988). Psychosocial functioning and depression: Distinguishing among antecedents, concomitants, and consequences. Psychological Bulletin, 104, 97-106.

Bebbington, P. (1985). Three cognitive theories of depression. Psychological Medicine, 15, 759-769.

Beck, A.T., (1967). Depression: clinical, experimental and theoretical aspects. New York: Harper & Row.

Beck, A.T. (1983). Cognitive therapy of depression: new perspectives. In P.J. Clayton and J.E. Barrett (Eds.). Treatment of Depression: Old Controversies and New Approaches. New York: Raven Press.

Beck, A.T. (1976). Cognitive Therapy and the Emotional Disorders. New York: International Universities Press.

Beck, A.T., & Weishaar, M. (1989). Cognitive therapy. In A. Freeman, K.M. Simon, L.E. Beutler and H. Arkowitz (Eds.). Comprehensive Handbook of Cognitive Therapy. New York: Plenum Press.

Beck, A.T., Rush, A.J., Shaw, B.F., & Emery, G. (1980). Cognitive Therapy of Depression. London: John Wiley and Sons.

Beck, A.T., Ward, C.H., Mendelson, M., Mack, J. & Erlbaugh, J. (1961). An inventory for measuring depression. Archives of General Psychiatry, 4, 561-571.

Bedeian, A.G. (1982). Suicide and Occupation: A Review. Journal of Vocational Behavior, 21, 206-223.

Billings, A.G., & Moos, R.N. (1981). The role of coping responses and social resources in attenuating the impact of stressful life events. Journal of Behavioral Medicine, 4, 139-157.

Billings, A.G., & Moos, R.N. (1982). Psychosocial theory and research on depression: An integrative framework and review. Clinical Psychology Review, 2, 213-237.

Blachly, P.H., Osterud, H.T., & Josslin, R. (1963). Suicide in professional groups. The New England Journal of Medicine, 268, 1278-1282.

Blaney, P.H. (1977). Contemporary theories of depression: critique and comparison. Journal of Abnormal Psychology, 86, 203-223.

Borkham, T.S., Hickey, A.A., & Ayer, W.A. (1981). Recreational and community activities of dentists. Social Science and Medicine, 15, 761-765.

Bowlby, J. (1971). Attachment and Loss, Vol. 1: Attachment. Harmondworth: Pelican Books.

Bowlby, J. (1973). Attachment and Loss, Vol. 2: Separation: Anxiety and anger. Harmondsworth: Pelican Books.

Boyd, J.H., & Weissman, M.M. (1981). Epidemiology of affective disorders. Archives of General Psychiatry, 38, 1039-1046.

Brown, G.W. (1979). The social etiology of depression. In R.A. Depue (Ed.), The psychobiology of the depressive disorders: Implications for the effects of stress. New York; Academic Press.

Brown, G.W., & Harris, T.O. (1978). Social Origins of Depression. London: Tavistock.

Brown, G.W., Harris, T.O., & Bifulco, A. (1986). Long term effects of early loss of parent. In M. Rutter, C.E. Izard, and P.B. Read (Eds.). Depression in Young People: Developmental and Clinical Perspectives. New York: Guiford Press.

Brown, R.A., & Lewinsohn, P.M. (1982). A psychoeducational approach to the treatment of depression: Comparison of group, individual and minimal contact procedures. Journal of Abnormal Psychology, 91, 231-238.

Burnkrant, R.E., & Page, T.J. Jr. (1984). A modification of the Fenigstein, Sheier, & Buss' self-consciousness scales. Journal of Personality and Social Psychology, 37, 1186-1195.

Buss, A. & Scheier, M. (1976). Self-consciousness, self-awareness and self-attribution. Journal of Research in Personality, 10, 463-468.

Buss, A.H., & Plomin, R. (1984). Temperament: Early developing personality traits. Hillsdale NJ: LEA Publishers.

Campbell, M.J.A., Coilett, K.R., & Fary, W.E. (1971). An activity survey of dentists. Australian Dental Journal, 16, 22-24.

Cardinell, C. (1981). Burnout? Mid-life crisis? Let's understand ourselves. Contemporary Education, 52, 103-108.

Carver, C.S., & Scheier, M.F. (1981). Attention and self regulation: A control-theory approach to human behavior. New York: Springer.

Cattell, R.B., Eber, H.W., & Tatsuoka, M.M. (1970). Handbook of the 16PF questionnaire. Illinois: IPAT.

Chapko, M.K., Bergner, M., Beach, B., Green, K., Milgram, P., & Skalabrin, N. (1986). Development of a measure of job satisfaction for dentists and dental auxiliaries. Community Dentistry and Oral Epidemiology, 14, 76-79.

Christen, A.G. (1984). Stress and distress in dental practice. In H.S. Goldman, K.S. Hartman, & J. Messite (Eds.). Occupational hazards in dentistry. Chicago: Year Book Inc.

Christensen, D. (1982). The relationship between self-consciousness and interpersonal effectiveness and a new scale to measure individual differences in self-consciousness. Personality and Individual Differences, 3, 177-188.

Chodoff, P. (1972). The depressive personality: A critical Review. International Journal of Psychology, 27, 196-217.

Clark,V.A., Aneshensel, C.S., & Frerichs, R.R. (1981). Analysis of effects of sex and age in response to items on the CES-D Scale. Psychiatric Research, 5, 171-181.

Cohen, J. & Cohen, P. (1975). Applied Multiple Regression/Correlation Analysis for the behavioral sciences. Hillsdale, NJ: LEA Publishers.

Comstock, G.W., & Helsing, K.J. (1976). Influence of demographic characteristics on two measures of depressive symptoms. Archives of General Psychiatry, 36, 149-154.

Cooper, C.L. (1980). Dentists Under Pressure: A Social Psychological Study. In C.L. Cooper & J. Marshall (Eds.). White Collar and Professional Stress. New York: John Wiley & Sons.

Cooper, K.H., & Christen, A.G. (1978). Dentist "Heal Thyself": Modification of lifestyle. Dental Clinics of North America, 22, 373-388.

Cooper, C.L., Watts, J., & Kelly, M. (1987). Job satisfaction, mental health and job stressors among general dental practitioners in the U.K. British Dental Journal, 51, 227-234.

Cooper, C.L., Watts, J., Baglioni, A.J. Jr., Kelly, M.(1988). Occupational stress among general practice dentists. Journal of Occupational Psychology, 61, 163-174.

Costa, P., & McCrae, R. (1985). The NEP Personality Inventory Manual. New York: Psychological Assessment Resources.

Costello, G.G. (1982). Social factors associated with depression: a retrospective community study. Psychological Medicine, 12, 329-339.

Coyne, J.C. (1976a). Depression and the response of others. Journal of Abnormal Psychology, 85, 186-193.

Craig, J.J. & Van Natta, P.A. (1976). Influence of demographic characteristics on two measures of depressive symptoms. Archives of General Psychiatry, 36, 149-154.

Crase, P. (1980). Antecedents of faculty frustration. Journal of Psychology, 66, 303-313.

Cureton, T.K. (1961). Health and physical fitness tests of dentists. Journal of Dental Medicine, 16, 211-221.

Dahlstrom, W.G., & Welsh, G.S. (1960). An MMPI handbook. Minneapolis: University of Minnesota Press.

DeFazio, F. (1984). "You're not the only one who suffers". American Health, 3, 20-22.

Depue, R.A. & Monroe, S. (1978). Learned helplessness in the perspective of the depressive disorders: conceptual and definitional issues. Journal of Abnormal Psychology, 87, 3-20.

Dillman, D.A. (1978). Mail and telephone surveys: The total design method. New York: Wiley-Interscience.

Dunlap, J.E., & Stewart, J.D. (1982). Survey suggests less stress in group offices Dental Economics, 51, 46-56.

Duval, S. & Wicklund, R. (1973). Effects of objective self- awareness on attribution of causality. Journal of Experimental Social Psychology, 9, 17-31.

Edelwich, J. & Brodsky, A. (1980). Burn-out, stages of disillusionment in the helping professions. New York: Human Sciences Press.

Eysenck, H. J. (1967). Biological Basis of Personality. Springfield, Illinois: Charles C. Thomas.

Eysenck, H. J., & Eysenck, S.B.G. (1969). Personality Structure and Measurement. London: Routledge & Kegan Paul.

Fenigstein, A. (1979). Self-consciousness, self-attention, and social interaction. Journal of Personality and Social Psychology, 37, 75-86.

Fenigstein, A., Scheier, C., & Buss, A. (1975). Public and private self-consciousness assessment and theory. Journal of Consulting and Clinical Psychology, 43, 3-27.

Festinger, L. (1957). A Theory of Cognitive Dissonance. Stanford: Stanford University Press.

Ficklin, T. (1983). Doing burnout. Personnel and Guidance Journal, 61, 578.

Forrest, W.R. (1978). Stresses and self-destructive behavior of dentists. Dental Clinics of North America, 22, 361-371.

Frederick, C.T. (1978). Current trends in suicidal behavior in the United States. American Journal of Psychotherapy, 32, 172-200.

Freudenberger, H.J. (1974). Staff burn-out. Journal of Social Issues, 30, 159-165.

Gallery, M.E., Whitley, T.W., Klonis, L.H., Anzinger, R.K., & Revnicki, D.A. (1992). A study of occupational stress and depression among emergency physicians. Annals of Emergency Medicine, 21, 58-64.

George, J.M., Whitworth, D.E., Sturdevant, J.R., & Lunden, T.F. (1987). Correlates of dental student stress. Journal of Dental Education, 51, 481-485.

Gift, H.C. (1977). Occupational hazards and emotional stress as related to morbidity and mortality of dentists: A review and comment on published research. Journal of the American Dental Association, 95, 606-613.

Grandy, T.G., Westerman, G.H., Combs, C.E. & Turner, C.H. (1989). Perceptions of stress among third-year dental students. Journal of Dental Education, 53, 718-721.

Greene, R. (1984). What's good for America isn't necessarily good for the dentists. Forbes, 134, 79-84.

Green, R.M., & Green, A. (1968). Fear of dentistry in adults. Dental Update, 22, 213-214.

Grosscup, S.J., & Lewinsohn, P.M. (1980). Unpleasant and pleasant events and mood. Journal of Clinical Psychology, 36, 252-259.

Golin, S., Sweeney, P.D., & Schaefer, D.E. (1981). The causality of causal attributions in depression: A cross-lagged panel correlational analysis. Journal of Abnormal Psychology, 90, 14-22.

Hagnell, O., Lanke, J., Rorsman, B., Ojesio, L. (1982). Are we entering an age of melancholy? Depressive illness in a prospective epidemiological study over 25 years: The Lundby Study, Sweden. Psychological Medicine, 12, 279-289.

Hammen, C.L., & Peters, S.D. (1978). Interpersonal consequences of depression: Responses to men and women enacting a depressed role. Journal of Abnormal Psychology, 87, 322-332.

Hark, R.D. (1983). The mythology of dental stress. Dental Economics, 3, 66-70.

Harris, D., Nicols, J, Stark, R., & Hill, K. (1978). The dental working environment and the risk of mercury exposure. Journal of the American Dental Association, 97, 811-815.

Hendrix, W.H. (1986). Dental stress model and assessment questionnaire. Dental Clinics of North America, 30, 1-11.

Hendrix, W.H., Ovalle, N.K., & Troxler, R.G. (1986). Behavioral and Physiological consequences of stress and its antecedent factors. Journal of Applied Psychology, 70, 188-201.

Hilliard-Lysen, J., & Riemer, J.W. (1988). Occupational stress and suicide among dentists. Deviant Behavior, 9, 333-346.

Hirschfeld, R.M.A., & Cross, C.K. (1982). Epidemiology of affective disorders. Archives of General Psychiatry, 39, 35-46.

Hixson, J.S. (1979). Forecasts of employment in the dental sector to 1990. Social Science and Medicine, 13, 181-185.

Hoberman, H.M., & Lewinsohn, P.M. (1985). The behavioral treatment of depression. In E.E. Beckham & W.R. Leber (Eds.). Handbook of Depression, Treatment, Assessment and research. New York: Dorsey Press.

Holmes, T.H., & Rahe, R.H. (1967). The Social readjustment rating scale. Journal of Psychosomatic Research, 11, 213-218.

House, J.S. (1981). Work stress and Social Support. New York: Wesley Publishing.

Howard, J.H., Cunningham, D.A., Rechnitzer, P.A., & Goode, R.C. (1976). Stress in the job and career of a dentist. Journal of the American Dental Association, 93, 630-636.

Hsu, K., & Marshall, V. (1987). Prevalence of depression and distress in a large sample of Canadian residents, interns, and fellows. American Journal of Psychiatry, 144, 1561-1566.

Hughes, E.C. (1981). Dilemmas and contraindications of status. The American Journal of Sociology, 137, 353-359.

Ickes, J., Wicklund, A., & Ferris, C. (1973). Objective self-awareness and self-esteem. Journal of Experimental Social Psychology, 9, 202-219.

Ingram, R.E., && Smith, T.S. (1984). Depression and internal vs external locus of attention. Cognitive Therapy and Research, 8, 139-152.

Ingram, R.E., Lumry, A.B., Cruet, D., & Sieber, W. (1987). Attentional processes in depressive disorders. Cognitive Therapy and Research, 19, 132-139.

Ivancevich, J.M., & Matteson, M.T. (1980). Stress and work: A managerial perspective. Glenview, IL.: Scott-Foresman.

Joos, R.W. (1975). Mercury vapor- a cloud over dentistry. Northwest dentistry, 54, 314-317.

Kaldenberg, D.O., & Becker, B.W. (1991). Test of the Korman hypothesis: performance, self-esteem, and job satisfaction among dentists. Psychological Reports, 69, 201-202.

Katz, C.A. (1982). Are you a hardy dentist? The relationship between personality and stress. Journal of Dental Practice Administration, 42, 100-107.

Katz, C.A. (1986). Stress factors operating in the dental office work environment. Dental Clinics of North America, 30, 29-36.

Klein, M. H., Kupfer, D.J., & Shea, M.T. (1993). Personality and Depression. New York: The Guiford Press.

Klerman, G.L., Lavori, P.W., Rice, J., Reich, T., Endicott, J., Andreasen, N.C., Keller, M.B., & Hirschfield, R.M.A. (1985). Birth-cohort trends in rates of major depressive disorder among relatives of patients with affective disorder. Archives of General Psychiatry, 42, 689-693.

Kobasa, S.C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. Journal of Personality and Social Psychology, 37, 1-11.

Korman, A.K. (1970). Toward an hypothesis of work behavior. Journal of Applied Psychology, 54, 31-41.

Kuiper, N., Derry, P.A., & MacDonald, M.R. (1982). Self-reference and person perception in depression: A social cognitive perspective. In G. Weary & H. Mirels (Eds.). Integrations of Social and Clinical Psychology. New York: Oxford University Press.

Labovitz, S. & Hagedorn, R. (1981). An analysis of suicide rates among occupational categories. Sociological Inquiry, 41, 67-72.

Langer, E. (1978). Rethinking the role of thought in social interaction. In J.H. Harvey (Ed). New Directions in Attribution Research. Hillsdale, NJ: LEA Publishers.

Lang - Runtz, H. (1984). Stress in dentistry: It can kill you. Journal of the Canadian Dental Association, 7, 537-541.

Lehman, H.E. (1971). Epidemiology of depressive disorders. In R.R. Fieve (Ed). Depression in the 70's. Princeton, NJ: Excerpta Medica

Lewinsohn, P.M. (1974). Behavior therapy: Assessment, Diagnosis, Design & Evaluation. New York: Springer.

Lewinsohn, P.M. (1975). The behavioral study and treatment of depression. In M. Hersen, R.M. Eisler, & P. M. Miller (Eds.). Progress in Behavior Modification, Vol. 1 New York: Academic Press.

Lewinsohn, P.M., & Amenson, C.S. (1978). Some relations between pleasant mood related events and depression. Journal of Abnormal Psychology, 87, 655-664.

Lewinsohn, P.M., Hautzinger, M., & Duncan, E. (1984). Is there an age of elevated risk for unipolar depression? Unpublished mimeo, University of Oregon.

Lewinsohn, P.M., & Hoberman, H. (1982). Depression. In A.S. Bellack, M. Hersen. and A.E. Kazdin (Eds.). International Handbook of Behavior Modification and Treatment. New York: Plenum Press.

Lewinsohn, P.M., Hoberman, H.M., & Rosenbaum, M. (1988). A prospective study of risk factors for unipolar depression. Journal of Abnormal Psychology, 97, 251-264.

Lewinsohn, P.M., Hoberman, H.M., Teri, L., & Hautzinger, M. (1985). An integrative theory of depression. In S. Reiss & R.R. Bootzin (Eds.). Theoretical issues in Behavior Therapy. New York: Academic Press.

Lewinsohn, P.M., Mischel, W., Chaplin, W., & Barton, R. (1980). Social competence and depression. Journal of Abnormal Psychology, 89, 203-212.

Lewinsohn, P.M., & Talkington, J. (1979). Studies on the measurement of unpleasant events and relations with depression. Applied Psychological Measurement, 3, 83-101.

Lewinsohn, P.M., Youngren, M.A., & Grosscup, S.J. (1979). Reinforcement and depression. In R.A. Depue (Ed). The psychobiology of depressive disorders. Implications for the effects of stress. New York: Academic Press.

Lin, N., Ensel, W.M., Simeone, R.S., and Kuo, W. (1979). Social support, stressful life events and illness. A model and an empirical test. Journal of Health and Social Behavior, 20, 108-119.

Lin, N., Dean, A., & Ensel, W. (1986). Social support, life events, and depression. New York: Academic Press.

Litchfield, N.B. (1989). Stress-related problems of dentists. International Journal of Psychosomatics, 36, 41-44.

Littleton, P.A. (1979). Differences between the medical and dental health sectors. Journal of Dental health Education, 42, 101-106.

Lloyd, C., & Gartrell, N.K. (1984). Psychiatric symptoms in medical students. Comprehensive Psychiatry, 25, 552-565.

Longcope, K. (1982). Burnout syndrome seems to be spreading like wildfire. The Harrisburg Evening News, September, 15, p.b.6.

MacPhillamy, D.J., & Lewinsohn, P.M. (1982). The Pleasant Events Schedule: Studies on reliability, validity and scale intercorrelation. Journal of Consulting and Clinical Psychology, 50, 363-380.

Malcolm, L.P., Ponce, A.Z., & Bardzinski, M. (1981). Stress prevention for the dentist. Clinical Preventive Dentistry, 3, 21-23.

Mallinger, M.A., Brousseau, K.R., and Cooper, C.L. (1982). Stress and success in dentistry. Some personal characteristics of successful dentists. Journal of Occupational Medicine, 20, 549-553.

Maris, R. (1981). Pathways to suicide: A survey of self destructive behaviors. Baltimore: Johns Hopkins University Press.

Martin, C.J. (1982). Psychosocial stress and psychiatric disorder. New York: Plenum Press.

Maslach, C. (1978). Job burnout: How people cope. Public Welfare, 36, 56-58.

Maslach, C., & Jackson, S. (1981). The measurement of experienced burnout. Journal of Occupational Behavior, 2, 99-113.

McGrath, E., Keita, G.P., Strickland, B.R., & Russo, N.F. (1990). Women and depression: Risk factors and treatment issues. Washington: American Psychological Association.

Meier, S. (1983). Toward a theory of burnout. Human Relations, 36, 899-910.

Meier, S. (1984). The construct validity of burnout. Journal of Occupational Psychology, 57, 211-219.

Murphy, J.M. (1980). Continuities in community-based psychiatric epidemiology. Archives of General Psychiatry, 37, 1215-1223.

Nielsen, N., & Polakoff, P. (1975). It hurts the dentist too. Journal of Safety and Health, 3, 21-25.

Nevin, R.S., & Sampson, V.M. (1986). Dental family stress and coping patterns. Dental Clinics of North America, 30, 117-132.

Orner, G., & Mumma, R.D. (1976). Mortality study of dentists, Final Report. Philadelphia: Temple University.

O'Shea, RM. Coroh, N.L., & Ayer, W.A. (1984). Sources of dentists stress. Journal of the American Dental Association, 109, 48-51.

Owen, D. (1982). The secret lives o dentists. Harper's Magazine, 264, 42-52.

Paykel, E.S., & Tanner, J. (1971). Life events, depressive relapse, and maintenance treatment. Psychological Medicine, 6, 481-485.

Perons, J.B., & Rao, P.A. (1985). Longitudinal study of cognitions, life events, and depression in psychiatric patients. Journal of Abnormal Psychology, 94, 51-63.

Pines, A., Aronson, E., & Kafry, D. (1981). Burnout. Dental Review, 19, 12-16.

Pyszczynski, T., & Greenberg, J. (1987). Self-regulatory perseveration and the depressive self-focusing style: A self-awareness theory of reactive depression. Psychological Bulletin, 102, 122-138.

Quast, H.H., & Schwarzer, R. (1984). Social support and stress: theoretical perspectives and selected empirical findings. In R. Schwarzer (Ed.), The Self in Anxiety, Stress and Depression. Amsterdam: Elsevier Science Publishers.

Rankin, J.A. & Harris, M.B. (1989). Male and female dentists talk about stress and coping. Dental Economics, 79, 59-64.

Rankin, J.A. & Harris, M.B. (1990a). Stress and health problems in dentists. Journal of Dental Practice Administration, 7, 2-8.

Rankin, J.A. & Harris, M.B. (1990b). A comparison of stress and coping in male and female dentists. Journal of Dental Practice Administration, 7, 166-172.

Raskin, A, Schulterbrandt, T., Reatig, N., & McKeon, J. (1969). Replication of factors of psychopathology in interview, ward behavior, and self report ratings of hospitalized depressives. Journal of Nervous and Mental Disease, 148, 87-96.

Reeves, J.B., & Reeves, H.C. (1976). The interrelationship of work and recreation: A case study of a dentist. Texas Dental Journal, 94, 14-16.

Robins, C.J., & Block, P. (1988). Personal vulnerability, life events and depressive symptoms: A test of a specific interactional model. Journal of Personality and Social Psychology, 54, 847-853.

Robins, C.J., & Block, P. (1989). Cognitive theories of depression viewed from a diathesis-stress perspective: Evaluations of the models of Beck and of Abramson, Seligman, and Teasdale. Cognitive Therapy and Research, 13, 297-313.

Rosch, P.J., & Woods, S.M. (1987). Dealing with physician stress. Medical Aspects of Human Sexuality, 27, 73-93.

Rose, K.D., & Rosow, I. (1973). Physicians who kill themselves. Archives of General Psychiatry, 29, 800-805.

Rothwell, N., & Williams, J.M. (1983). Attributions and life events. British Journal of Clinical Psychology, 22, 139-140.

Russek, H.I. (1962). Emotional stress and coronary heart disease in American physicians, dentists, and lawyers. American Journal of Medical Science, 243, 716-725.

Sassali, M. (1979). Burnout in the social services: A literature review. Chicago: Human Service Consultants.

Scheier, M.F., Carver, C.S., & Gibbons, F.X. (1981). Self focused attention and reactions to fear. Journal of Research in Personality, 15, 1-15.

Schmidt, L.C., & Neidhardt, E.J. (1985). Holidays and leisure time: Do you know how to use them? Journal of the Canadian Dental Association, 5, 349-352.

Sebor, R.J. (1984). Stress: Inherent to dentists or taught to dental students? Dental Student, 32, 14-20.

Seligman, M.E.P. (1975). Helplessness. San Francisco: Freeman.

Seligman, M.E.P., & Peterson, C. (1986). A learned helplessness perspective on childhood depression: Theory and research. In M. Rutter, C.E. Izard, & P.B. Read (Eds). Depression in Young People: Developmental and clinical Perspectives New York: Guilford Press.

Seligman, M.E.P., & Abramson, L.Y., Semmel, A., & Von Baeyer, C. (1979). Depressive attributional style. Journal of Abnormal Psychology, 77, 242-247.

Selye, H. (1950). The psychology and pathology of exposure to stress. Montreal: Acta.

Shugars, D.A., DiMatteo, M.R., Hays, R.D., Cretin, S., Johnson, J.D. (1990). Professional satisfaction among California general dentists. Journal of Dental Education, 54, 661- 669.

Shurtz, J.D., Mayhew, R.B., & Cayton, T.G. (1986). Depression: Recognition and control. Dental Clinics of North America, 30, 55-64.

Silber, E., & Tippet, J. (1965). Self-Esteem: Clinical assessment and measurement validation. Psychological Reports, 16, 1017-1071.

Silverstein, R. (1982). How experienced psychotherapists cope with burnout. Dissertation Prospectus. Carbondale: South Illinois University

Smith, T.W., & Greenberg, J. (1981). Depression and self focused attention. Motivation and Emotion, 5, 323-331.

Smith, T.W., Ingram, R.E., & Roth, D.L. (1985). Self-focused attention and depression: self evaluation, affect and life stress. Motivation and Emotion, 9, 323-331.

Speilberger, C.D., Gorsuch, R.L., & Lushene, R.E. (1976). State-trait Inventory. Tallahassee, FL: Florida State University.

Staats, A. W. & Heiby, E.M. (1985). Paradigmatic behaviorism's theory of depression: Unified, explanatory, and heuristic. In S. Reiss, & R. Bootzin, (Eds.), Theoretical Issues in Behavior Therapy. New York: Academic Press.

Sturdevant, J.R., George, J.M., Lundeen, T.F. (1987). An interactional view of dental student stress. Journal of Dental Education, 51, 246-249.

Sutherland, V.J., & Cooper, C.L. (1990). Understanding Stress: A psychological perspective for health professionals. London: Chapman and Hall.

Sword, R.O. (1977). The depression-prone personality: almost too good to be true. Dental Survey, 59, 12-18.

Tabachnick, B.G., & Fidell, L.S. (1983). Using Multivariate Statistics. New York: Harper & Row.

Tisdelle, D.A., Hansen, D.J., Lawrence, J.S., & Brown, J.C. (1984). Stress management training for dental students. Journal of Dental Education, 48, 196-202.

Uhl, G.S., Troxler, R.G., & Hickman, T.R. (1981). Relation between high density lipoprotein cholesterol and coronary disease in asymptomatic men. American Journal of Cardiology, 48, 903-910.

U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control (1980). Ten leading causes of death in the U.S. Atlanta, GA.

U.S. Department of Labor (1986). Occupational Outlook Handbook, 1986-87. Washington, D.C.: Government Printing Office.

Vaillant, G.E., Brighton, J.R., & McCarthur, C. (1972). Some psychological vulnerabilities of physicians. New England Journal of Medicine, 287, 372-375.

Warheit, G.J. (1979). Life events, coping, stress and depressive symptomology. American Journal of Psychiatry, 136, 502-507.

Waring, E.M. (1974). Psychiatric illness in physicians, a review. Comprehensive Psychiatry, 15, 519-530.

Weiskopf, P. (1980). Burnout among teachers of exceptional children. Exceptional Children, 47, 18-23.

Weissman, M., & Klerman, G. (1977). Sex differences and the epidemiology of depression. Archives of General Psychiatry, 34, 98-111.

Weissman, M.M., & Myers, J.K. (1978). Affective disorders in a U.S. urban community. Archives of General Psychiatry, 35, 1304-1311.

Whybrow, P.C., Akiskal, H.S. & Mckinney, W.T. (1984). Mood disorders: Toward a new psychology. New York: Plenum Press.

Wierzbicki, M., & Rexford, L. (1989). Cognitive and behavioral correlates of depression in clinical and nonclinical populations. Journal of Clinical Psychology, 45, 872-877.

Wilcox, B.L. (1981). Social Support, life stress, and psychological adjustment: A test of the buffering hypothesis. American Journal of Community Psychology, 9, 371-386.

Wilkinson, R.B. (1993). The Staats-Heiby theory of depression: the role of event frequency and affect reevaluated. Behavior, Research, and Therapy, 31, 97-104.

Willey, J.L. (1987). Dental burnout. Journal of Dental Practice Administration, 59, 108-111.

Wilson, B. (1984). Stress in dentistry: National Survey. Dental Management, July, 14-19.

Wilson, S.J., & Wilson, H.J. (1982). Mercury leakage for disposable capsules. British Dental Journal, 153, 144-147.

Wycoff, S.J.(1984). An examination of what dentists already know about stress and burnout within dentistry. Canadian Dental Association Journal, 47, 114-117.

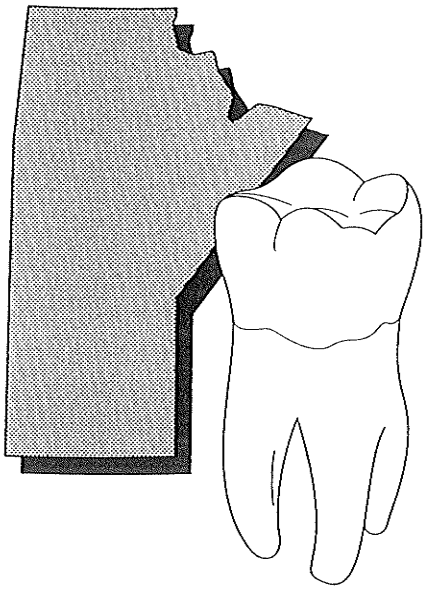
Youngren, M.A., & Lewinsohn, P.M. (1980). The functional relationship between depression and problematic interpersonal behavior. Journal of Abnormal Psychology, 89, 333-341.

Zajonc, R. (1980). Feeling and thinking. American Psychologist, 35, 151-175.

Appendix A

Survey Questionnaire

A Survey of Job Stress and Job Satisfaction Among Manitoba Dentists



This questionnaire focuses on issues related to job satisfaction, job stress, and quality of life in the dental profession. Questions are arranged so that you either fill in the blanks or circle the response that fits best for you. Please answer all the questions in the order they appear. If you wish to comment on any questions or qualify your answers, please feel free to use the space in the margins.

Return this questionnaire to:

Department of Psychology
University of Manitoba
Winnipeg, Manitoba
R3T 2N2

In this first section are some statements which describe different aspects of a dentist's work. For each statement we would like to know how satisfied you are with that aspect of your work. Please indicate your degree of satisfaction by circling the appropriate number.

Please use the following scale:

1= very dissatisfied	4= slightly satisfied
2= moderately dissatisfied	5= moderately satisfied
3= slightly dissatisfied	6= very satisfied

1. The amount of responsibility entrusted to you ..... 1 .... 2 .... 3 ... 4 ... 5 6
2. The opportunity to be helpful to patients ..... 1 .... 2 .... 3 ... 4 ... 5 6
3. The timeliness and appropriateness of the feedback you receive regarding your work..... 1 .... 2 .... 3 ... 4 ... 5 6
4. The concerns that staff members show towards each other ..... 1 .... 2 .... 3 ... 4 ... 5 6
5. The opportunity to use your skills, training, and talents to the fullest ..... 1 .... 2 .... 3 ... 4 ... 5 6
6. With the time you have for professional contacts with colleagues ..... 1 .... 2 .... 3 ... 4 ... 5 6
7. The duties delegated to auxiliaries..... 1 .... 2 .... 3 ... 4 ... 5 6
8. The information given to you by other staff members to get the job done right ..... 1 .... 2 .... 3 ... 4 ... 5 6
9. The time and opportunity to keep up with the field of dentistry ..... 1 .... 2 .... 3 ... 4 ... 5 6
10. The quality of dental care provided by the auxiliaries in the office..... 1 .... 2 .... 3 ... 4 ... 5 6
11. The competency of the office staff ..... 1 .... 2 .... 3 ... 4 ... 5 6
12. The number of things you have to do in the office that you dislike ..... 1 .... 2 .... 3 ... 4 ... 5 ... 6
13. The amount of checking up on the work of others that you must do..... 1 .... 2 .... 3 ... 4 ... 5 6
14. The variety of things you do in the office ..... 1 .... 2 .... 3 ... 4 ... 5 6
15. With opportunities to advance your career ..... 1 .... 2 .... 3 ... 4 ... 5 6
16. The opportunity for personal growth through your work..... 1 .... 2 .... 3 ... 4 ... 5 6

17. The prestige associated with your work ..... 1 .... 2 .... 3 ... 4 ... 5 6

18. The time and opportunities to improve your dental skills ..... 1 .... 2 .... 3 ... 4 ... 5 6

19. The amount of time you have for leisure ..... 1 .... 2 .... 3 ... 4 ... 5 6

20. The amount of freedom you have to decide how to do the work ..... 1 .... 2 .... 3 ... 4 ... 5 6

21. The opportunity to develop your own special abilities ..... 1 .... 2 .... 3 ... 4 ... 5 6

22. The availability of enough help to get the job done right ..... 1 .... 2 .... 3 ... 4 ... 5 6

23. The praise you receive for work done particularly well ..... 1 .... 2 .... 3 ... 4 ... 5 6

24. The amount of your time devoted to doing things that could be done by others with less training and experience ..... 1 .... 2 .... 3 ... 4 ... 5 6

25. The amount of challenge in your work ..... 1 .... 2 .... 3 ... 4 ... 5 6

26. The amount of paperwork you have to do ..... 1 .... 2 .... 3 ... 4 ... 5 6

27. The amount of help the office staff give to each other ..... 1 .... 2 .... 3 ... 4 ... 5 6

28. The degree to which your responsibilities are clearly defined ..... 1 .... 2 .... 3 ... 4 ... 5 6

29. The amount of supervising you have to do ..... 1 .... 2 .... 3 ... 4 ... 5 6

30. The recognition you receive for doing a good job ..... 1 .... 2 .... 3 ... 4 ... 5 6

31. The number of hours you devote to the practice ..... 1 .... 2 .... 3 ... 4 ... 5 6

32. The amount of information given to you to get the job done right ..... 1 .... 2 .... 3 ... 4 ... 5 6

33. The income you receive from your work in this dental practice ..... 1 .... 2 .... 3 ... 4 ... 5 6

34. How well the office staff works together ..... 1 .... 2 .... 3 ... 4 ... 5 6

35. With your opportunity to provide high quality care ..... 1 .... 2 .... 3 ... 4 ... 5 6

36. The security of your job and income ..... 1 .... 2 .... 3 ... 4 ... 5 6

Next, you will find some statements describing various problems that dentists sometimes encounter on the job. For each one, indicate the degree that it is a problem for you by circling the appropriate number.

Please use the following scale:

1 = Not a problem
2 = Not a serious problem
3 = A fairly serious problem
4 = A very serious problem

1. Fatigue from work ..... 1 .... 2 .... 3 4
2. The amount of time you have for each patient ..... 1 .... 2 .... 3 4
3. The physical layout of the office ..... 1 .... 2 .... 3 4
4. The amount of time available to get the job done ..... 1 .... 2 .... 3 4
5. The number of uncooperative patients ..... 1 .... 2 .... 3 4
6. Frustrations during work ..... 1 .... 2 .... 3 4
7. Feeling rushed ..... 1 .... 2 .... 3 4
8. The amount of on-the-job pressures ..... 1 .... 2 .... 3 4
9. Physical problems resulting from the office, e.g., eyestrain, backpain, etc. ..... 1 .... 2 .... 3 4

Now we would like to get your overall opinion about your work as a dentist. Please circle the appropriate number.

1. All in all, how satisfied would you say you are with your work?

   1 Very Satisfied 2 Somewhat Satisfied 3 Not too Satisfied 4 Not at all Satisfied

2. If a good friend of yours told you he/she was interested in work like yours, what would you tell him/her?

   1 Strongly recommend it 2 Have doubts about recommending it 3 Advise him/her against it

3. Knowing what you know now, if you had to decide all over again whether to do this type of work, what would you decide?

   1 Decide without hesitation to take same work 2 Have some second thoughts 3 Decide definitely not to take the work

4. Taking everything into consideration, how likely is it that you will make a genuine effort to find new work within the year?

   1 Very likely 2 Somewhat likely 3 Not at all likely

Another important part of understanding a person's job satisfaction has to do with the kinds of recent experiences that person has had. In this next section you will find a list of activities, events, and experiences. ***How often have these events happened in your life in the past month?*** Please answer this question by circling the appropriate number beside each event.

Please use the following scale:

1 = This has *not happened* to me in the past 30 days.
2 = This has *happened a few times* (1 to 6) in the past 30 days.
3 = This has *happened often* (7 or more) in the past 30 days.

Important: Some items will list more than one event; for these items, mark how often you have done any of the listed events.

1. Meeting someone new of the same sex ..... 1 .... 2 3
2. Reading the Scriptures or other sacred works ..... 1 .... 2 3
3. Going to lectures or hearing speakers ..... 1 .... 2 3
4. Breathing clean air ..... 1 .... 2 3
5. Having lunch with friends or associates ..... 1 .... 2 3
6. Going to a party ..... 1 .... 2 3
7. Being with friends ..... 1 .... 2 3
8. Being popular at a gathering ..... 1 .... 2 3
9. Seeing good things happen to my family or friends ..... 1 .... 2 3
10. Planning or organizing something ..... 1 .... 2 3
11. Introducing people who I think would like each other ..... 1 .... 2 3
12. Meeting someone new of the opposite sex ..... 1 .... 2 3
13. Doing a job well ..... 1 .... 2 3
14. Learning to do something new ..... 1 .... 2 3
15. Being praised by people I admire ..... 1 .... 2 3
16. Feeling the presence of the Lord in my life ..... 1 .... 2 3
17. Getting up early in the morning ..... 1 .... 2 3
18. Visiting friends ..... 1 .... 2 3

1 = This has *not happened* to me in the past 30 days.
2 = This has *happened a few times* (1 to 6) in the past 30 days.
3 = This has *happened often* (7 or more) in the past 30 days.

19. Being relaxed ..... 1 .... 2 3
20. Sleeping soundly at night ..... 1 .... 2 3
21. Watching people ..... 1 .... 2 3
22. Finishing a project or task ..... 1 .... 2 3
23. Being with happy people ..... 1 .... 2 3
24. Going to banquets, luncheons, potlucks, etc. ..... 1 .... 2 3
25. Making a new friend ..... 1 .... 2 3
26. Seeing old friends ..... 1 .... 2 3

Now please go over the list once again. This time the question is: ***How pleasant, enjoyable or rewarding was each event during the past month?*** Please answer this question by circling the appropriate number beside each event.

Please use the following scale:

1 = This was *not pleasant*. (Use this rating for events which were either neutral or unpleasant).
2 = This was *somewhat pleasant*. (use this rating for events which were mildly or moderately pleasant).
3 = This was *very pleasant*. (Use this rating for events which were strongly or extremely pleasant).

Important: If an event has happened more than once in the past month, try to rate roughly how pleasant it was on the average. If an event has not happened to you during the past month, then rate it according to how much fun you think it would have been.

1. Meeting someone new of the same sex ..... 1 .... 2 3
2. Reading the Scriptures or other sacred works ..... 1 .... 2 3
3. Going to lectures or hearing speakers ..... 1 .... 2 3
4. Breathing clean air ..... 1 .... 2 3
5. Having lunch with friends or associates ..... 1 .... 2 3
6. Going to a party ..... 1 .... 2 3
7. Being with friends ..... 1 .... 2 3

8. Being popular at a gathering ..... 1 .... 2 3
9. Seeing good things happen to my family or friends ..... 1 .... 2 3
10. Planning or organizing something ..... 1 .... 2 3
11. Introducing people who I think would like each other ..... 1 .... 2 3
12. Meeting someone new of the opposite sex ..... 1 .... 2 3
13. Doing a job well ..... 1 .... 2 3
14. Learning to do something new ..... 1 .... 2 3
15. Being praised by people I admire ..... 1 .... 2 3
16. Feeling the presence of the Lord in my life ..... 1 .... 2 3
17. Getting up early in the morning ..... 1 .... 2 3
18. Visiting friends ..... 1 .... 2 3
19. Being relaxed ..... 1 .... 2 3
20. Sleeping soundly at night ..... 1 .... 2 3
21. Watching people ..... 1 .... 2 3
22. Finishing a project or task ..... 1 .... 2 3
23. Being with happy people ..... 1 .... 2 3
24. Going to banquets, luncheons, potlucks, etc. ..... 1 .... 2 3
25. Making a new friend ..... 1 .... 2 3
26. Seeing old friends ..... 1 .... 2 3

Next, you will find a different list of activities, events and experiences than you found in the previous sections. ***How often have these events happened in your life in the past month?*** Please answer this question by circling the appropriate number beside each event.

Please use the following scale:

1 = This has *not happened* in the past 30 days.
2 = This has *happened a few times* (1 to 6) in the past 30 days.
3 = This has *happened often* (7 or more) in the past 30 days.

1. Being alone ..... 1 .... 2 3
2. Being in a situation where I don't know many people ..... 1 .... 2 3
3. Being asked something I could not, or did not want to answer ..... 1 .... 2 3
4. Being with people who don't share my interests ..... 1 .... 2 3
5. Being dissatisfied with my spouse (living partner) ..... 1 .... 2 3
6. Arguments with spouse (living partner) ..... 1 .... 2 3
7. Having too much to do ..... 1 .... 2 3
8. Being in a crowded place ..... 1 .... 2 3
9. Having something break or run poorly (car, etc) ..... 1 .... 2 3
10. Realizing that someone I love and I are growing apart ..... 1 .... 2 3
11. Doing something I don't want to in order to please someone else ..... 1 .... 2 3
12. Lying to someone ..... 1 .... 2 3
13. Working at something I don't enjoy ..... 1 .... 2 3
14. Being misunderstood or misquoted ..... 1 .... 2 3
15. Being misled, bluffed, or tricked ..... 1 .... 2 3
16. Leaving a task uncompleted ..... 1 .... 2 3
17. Working on something I don't care about ..... 1 .... 2 3
18. Being physically uncomfortable (dizzy, itchy, headachy, etc.) ..... 1 .... 2 3
19. Being excluded or left out ..... 1 .... 2 3

20. Not having enough time to be with people I care about (spouse, friends, etc.) ..... 1 .... 2 3
21. Working with little reward or pay ..... 1 .... 2 3
22. Being rushed ..... 1 .... 2 3
23. Cooking or preparing meals ..... 1 .... 2 3
24. Being in an unfamiliar place ..... 1 .... 2 3
25. Saying something unclearly ..... 1 .... 2 3
26. Having my spouse (living partner) dissatisfied with me ..... 1 .... 2 3
27. Forgetting something (a name or meeting, etc.) ..... 1 .... 2 3
28. Getting separated or divorced from my spouse ..... 1 .... 2 3
29. Experiencing the death of someone dear ..... 1 .... 2 3
30. Having a new person move into my home (i.e., childbirth, adoption, grandparents, etc.) ..... 1 .... 2 3
31. Having a person move out of my home ..... 1 .... 2 3
32. Experiencing serious personal illness ..... 1 .... 2 3
33. Having a relative or friend with serious illness ..... 1 .... 2 3
34. Started working or changed jobs ..... 1 .... 2 3
35. Had financial problems ..... 1 .... 2 3

Now please go over this list once again. This time the question is: ***How unpleasant, annoying, upsetting, or otherwise aversive was each event during the past month?*** Please answer this question by circling the appropriate number beside each event.

Please use the following scale:

1 = This was *not unpleasant* (Use this rating for events which were either neutral or pleasant).
2 = This was *somewhat unpleasant* (Use this rating for events which were mildly or moderately unpleasant).
3 = This was *very unpleasant* (Use this rating for events which were strongly or extremely unpleasant).

Important: If an event has happened more than once in the past month, try to rate roughly how unpleasant it was on the average. If an event has not happened to you during the past month, then rate it according to how upsetting you think it would have been.

1. Being alone ..... 1 .... 2 3
2. Being in a situation where I don't know many people ..... 1 .... 2 3
3. Being asked something I could not, or did not want to answer ..... 1 .... 2 3
4. Being with people who don't share my interests ..... 1 .... 2 3
5. Being dissatisfied with my spouse (living partner) ..... 1 .... 2 3
6. Arguments with spouse (living partner) ..... 1 .... 2 3
7. Having too much to do ..... 1 .... 2 3
8. Being in a crowded place ..... 1 .... 2 3
9. Having something break or run poorly (car, etc) ..... 1 .... 2 3
10. Realizing that someone I love and I are growing apart ..... 1 .... 2 3
11. Doing something I don't want to in order to please someone else ..... 1 .... 2 3
12. Lying to someone ..... 1 .... 2 3
13. Working at something I don't enjoy ..... 1 .... 2 3
14. Being misunderstood or misquoted ..... 1 .... 2 3
15. Being misled, bluffed, or tricked ..... 1 .... 2 3
16. Leaving a task uncompleted ..... 1 .... 2 3

17. Working on something I don't care about ..... 1 .... 2 3
18. Being physically uncomfortable (dizzy, itchy, headachy, etc.) ..... 1 .... 2 3
19. Being excluded or left out ..... 1 .... 2 3
20. Not having enough time to be with people I care about (spouse, friends, etc.) ..... 1 .... 2 3
21. Working with little reward or pay ..... 1 .... 2 3
22. Being rushed ..... 1 .... 2 3
23. Cooking or preparing meals ..... 1 .... 2 3
24. Being in an unfamiliar place ..... 1 .... 2 3
25. Saying something unclearly ..... 1 .... 2 3
26. Having my spouse (living partner) dissatisfied with me ..... 1 .... 2 3
27. Forgetting something (a name or meeting, etc.) ..... 1 .... 2 3
28. Getting separated or divorced from my spouse ..... 1 .... 2 3
29. Experiencing the death of someone dear ..... 1 .... 2 3
30. Having a new person move into my home (i.e., childbirth, adoption, grandparents, etc.) ..... 1 .... 2 3
31. Having a person move out of my home ..... 1 .... 2 3
32. Experiencing serious personal illness ..... 1 .... 2 3
33. Having a relative or friend with serious illness ..... 1 .... 2 3
34. Started working or changed jobs ..... 1 .... 2 3
35. Had financial problems ..... 1 .... 2 3

Another important purpose of this study is to try and understand more about the type of people who enter the dental profession. In this section we would like you to read the following statements and indicate how characteristic that statement is of you by circling the appropriate number.

Use the following scale:

1 = extremely uncharacteristic of me
2 = not very characteristic of me
3 = slightly characteristic of me
4 = fairly characteristic of me
5 = extremely characteristic of me

1. I like to be with people ..... 1 .... 2 .... 3 ... 4 5
2. I usually seem to be in a hurry ..... 1 .... 2 .... 3 ... 4 5
3. I am easily frightened ..... 1 .... 2 .... 3 ... 4 5
4. I frequently get distressed ..... 1 .... 2 .... 3 ... 4 5
5. When displeased, I let people know it right away ..... 1 .... 2 .... 3 ... 4 5
6. I am something of a loner ..... 1 .... 2 .... 3 ... 4 5
7. I like to keep busy all the time ..... 1 .... 2 .... 3 ... 4 5
8. I am known as hotblooded and quick-tempered ..... 1 .... 2 .... 3 ... 4 5
9. I often feel frustrated ..... 1 .... 2 .... 3 ... 4 5
10. My life is fast paced ..... 1 .... 2 .... 3 ... 4 5
11. Everyday events make me troubled and fretful ..... 1 .... 2 .... 3 ... 4 5
12. I often feel insecure ..... 1 .... 2 .... 3 ... 4 5
13. There are many things that annoy me ..... 1 .... 2 .... 3 ... 4 5
14. When I get scared, I panic ..... 1 .... 2 .... 3 ... 4 5
15. I prefer working with others rather than alone ..... 1 .... 2 .... 3 ... 4 5
16. I get emotionally upset easily ..... 1 .... 2 .... 3 ... 4 5
17. I often feel as if I'm bursting with energy ..... 1 .... 2 .... 3 ... 4 5
18. It takes alot to make me mad ..... 1 .... 2 .... 3 ... 4 5
19. I have fewer fears than most people my age ..... 1 .... 2 .... 3 ... 4 5

20. I find people more stimulating than anything else ..... 1 .... 2 .... 3 ... 4 5

21. I'm always trying to figure myself out ..... 1 .... 2 .... 3 ... 4 5

22. I'm concerned about my style of doing things ..... 1 .... 2 .... 3 ... 4 5

23. It takes me time to overcome my shyness in new situations ..... 1 .... 2 .... 3 ... 4 5

24. I reflect about myself alot ..... 1 .... 2 .... 3 ... 4 5

25. I'm concerned about the way I present myself ..... 1 .... 2 .... 3 ... 4 5

26. I'm often the subject of my own fantasies ..... 1 .... 2 .... 3 ... 4 5

27. I have trouble working when someone is watching me ..... 1 .... 2 .... 3 ... 4 5

28. I get embarrassed very easily ..... 1 .... 2 .... 3 ... 4 5

29. I'm self-conscious about the way I look ..... 1 .... 2 .... 3 ... 4 5

30. I'm generally attentive to my inner feelings ..... 1 .... 2 .... 3 ... 4 5

31. I usually worry about making a good impression ..... 1 .... 2 .... 3 ... 4 5

32. I'm constantly examining my motives ..... 1 .... 2 .... 3 ... 4 5

33. I feel anxious when I speak in front of a group ..... 1 .... 2 .... 3 ... 4 5

34. I sometimes have the feeling that I'm off somewhere watching myself ..... 1 .... 2 .... 3 ... 4 5

35. I'm concerned about what other people think about me ..... 1 .... 2 .... 3 ... 4 5

36. I'm alert to changes in my mood ..... 1 .... 2 .... 3 ... 4 5

37. I'm aware of the way my mind works when I work through a problem ..... 1 .... 2 .... 3 ... 4 5

38. Large groups make me nervous ..... 1 .... 2 .... 3 ... 4 5

Next, you will find a few more statements which help us understand the type of people who enter dentistry. Please read the statements and indicate how much you agree or disagree with them by circling the appropriate number.

Use the following scale:

1 = Strongly Agree
2 = Agree
3 = Disagree
4 = Strongly Disagree

1. I feel that I'm a person of worth, at least on an equal plane with others ..... 1 .... 2 .... 3 ... 4
2. I feel that I have a number of good qualities ..... 1 .... 2 .... 3 ... 4
3. All in all, I am inclined to feel that I am a failure ..... 1 .... 2 .... 3 ... 4
4. I am able to do things as well as most other people ..... 1 .... 2 .... 3 ... 4
5. I feel I do not have much to be proud of ..... 1 .... 2 .... 3 ... 4
6. I take a positive attitude toward myself ..... 1 .... 2 .... 3 ... 4
7. On the whole, I am satisfied with myself ..... 1 .... 2 .... 3 ... 4
8. I wish I could have more respect for myself ..... 1 .... 2 .... 3 ... 4
9. I certainly feel useless at times ..... 1 .... 2 .... 3 ... 4
10. At times I think I am no good at all ..... 1 .... 2 .... 3 ... 4

Another area of interest in our study involves the general quality of life of Manitoba dentists. Therefore, we would like to ask you about your relationships, well-being, and health in a number of areas over the last while.

In this next section are some questions about relationship problems that people sometimes have. Please indicate how often you have been bothered by these problems over the ***past 6 months*** by circling the appropriate number.

Please use the following scale:

1 = Most or all of the time
2 = Occasionally or a moderate amount of the time
3 = Some or a little of the time
4 = Rarely
5 = Never

1. Problems with in-laws/relatives ..... 1 .... 2 .... 3 ... 4 5
2. Having no one who understands my problems ..... 1 .... 2 .... 3 ... 4 5
3. Conflicts with people who are close ..... 1 .... 2 .... 3 ... 4 5
4. Having no close companion ..... 1 .... 2 .... 3 ... 4 5

5. Not seeing enough of people close to you ..... 1 .... 2 .... 3 ... 4 5
6. Not enough close friends ..... 1 .... 2 .... 3 ... 4 5
7. Dissatisfied with marital status ..... 1 .... 2 .... 3 ... 4 5
8. Having no one who shows love and affection ..... 1 .... 2 .... 3 ... 4 5
9. Having no one to depend on ..... 1 .... 2 .... 3 ... 4 5
10. Problems with children ..... 1 .... 2 .... 3 ... 4 5
11. Problems with spouse/ex-spouse ..... 1 .... 2 .... 3 ... 4 5
12. Not having children ..... 1 .... 2 .... 3 ... 4 5

Next, you will find a series of questions which describe the way people sometimes feel or behave. Please circle the answer that describes how often you have felt this way *during the past week*.

Use the following scale:

1 = Rarely or none of the time (less than 1 day)
2 = Some or a little of the time (1 to 2 days)
3 = Occasionally or a moderate amount of the time (3 to 4 days)
4 = Most or all of the time (5 to 7 days)

1. I was bothered by things that usually don't bother me ..... 1 .... 2 .... 3 4
2. I did not feel like eating, my appetite was poor ..... 1 .... 2 .... 3 4
3. I felt that I could not shake off the blues even with the help of family or friends ..... 1 .... 2 .... 3 4
4. I felt that I was just as good as other people ..... 1 .... 2 .... 3 4
5. I had trouble keeping my mind on what I was doing ..... 1 .... 2 .... 3 4
6. I felt depressed ..... 1 .... 2 .... 3 4
7. I felt that everything I did was an effort ..... 1 .... 2 .... 3 4
8. I felt hopeful about the future ..... 1 .... 2 .... 3 4
9. I thought my life had been a failure ..... 1 .... 2 .... 3 4
10. I felt fearful ..... 1 .... 2 .... 3 4
11. My sleep was restless ..... 1 .... 2 .... 3 4
12. I was happy ..... 1 .... 2 .... 3 4

1 = Rarely or none of the time (less than 1 day)
2 = Some or a little of the time (1 to 2 days)
3 = Occasionally or a moderate amount of the time (3 to 4 days)
4 = Most or all of the time (5 to 7 days)

13. I talked less than usual ..... 1 .... 2 .... 3 4
14. I felt lonely ..... 1 .... 2 .... 3 4
15. People were unfriendly ..... 1 .... 2 .... 3 4
16. I enjoyed life ..... 1 .... 2 .... 3 4
17. I had crying spells ..... 1 .... 2 .... 3 4
18. I felt sad ..... 1 .... 2 .... 3 4
19. I felt people disliked me ..... 1 .... 2 .... 3 4
20. I could not get "going" ..... 1 .... 2 .... 3 4

In this next section are questions about your experiences with alcohol. Please circle the appropriate number.

1. During the past 12 months how often on average did you drink alcoholic beverages? Was it...

   1. EVERYDAY?
   2. 4-6 TIMES A WEEK?
   3. 2-3 TIMES A WEEK?
   4. ONCE A WEEK?
   5. 1-3 TIMES A MONTH?
   6. LESS THAN ONCE A MONTH?
   7. NEVER *(please proceed to the next section).*

2. On the days when you drank how many drinks did you usually have?

   1. ONE DRINK
   2. 2 OR 3 DRINKS
   3. 4 TO 7 DRINKS
   4. 8 TO 11 DRINKS
   5. 12 OR MORE DRINKS

3. How many times in the past 12 months have you had FIVE or more drinks on one occasion?

   1. ONCE
   2. 2 OR 3 TIMES
   3. 4 TO 7 TIMES
   4. 8 TO 11 TIMES
   5. 12 OR MORE TIMES

4. In the past 12 months, what is the highest number of drinks you can recall having on any one occasion?

   1. 1 TO 5 DRINKS
   2. 8 to 11 DRINKS
   3. 11 TO 19 DRINKS
   4. 20 OR MORE DRINKS

5. Has your drinking changed over the last 12 months?

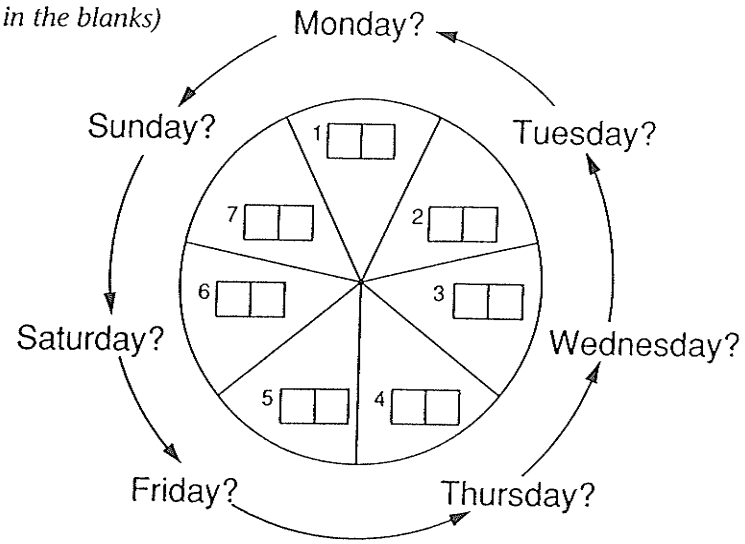
   1. DRINKING MORE NOW
   2. DRINKING LESS NOW
   3. NO CHANGE OVER LAST 12 MONTHS

6. Was there ever a time that you felt your alcohol use had a harmful effect on...

		Was this during the past 12 months?	
a. your friendships or social life?	1. YES 2. NO →	1. YES	2. NO
b. your physical health?	1. YES 2. NO →	1. YES	2. NO
c. your outlook on life (happiness)?	1. YES 2. NO →	1. YES	2. NO
d. your home life or marriage?	1. YES 2. NO →	1. YES	2. NO
e. your work or employment opportunities	1. YES 2. NO →	1. YES	2. NO
f. your financial position?	1. YES 2. NO →	1. YES	2. NO

7. Beginning with yesterday, how many drinks did you have on each on the last 7 days? If none at all place a tick (✓) in the box ☐ and proceed to the next section.

(Please fill in the blanks)



Finally, we would like to ask some questions to help us know the range of people participating in the study. Please circle the appropriate number.

1. Sex: 1. MALE 2. FEMALE

2. What is your present age?

1. LESS THAN 30
2. 30 – 39
3. 40 – 49
4. 50 – 59
5. 60 – 69
6. 70 OR OVER

3. What is your current marital status?

1. SINGLE - NEVER MARRIED
2. LIVING COMMON-LAW
3. NOW MARRIED
4. DIVORCED
5. WIDOWED
6. SEPARATED

4. What is your current work status?

1. WORKING FULL-TIME
2. WORKING PART-TIME

5. How many years have you been in practice?

1. LESS THAN 1 YEAR
2. 1– 4 YEARS
3. 5 – 10 YEARS
4. 11– 19 YEARS
5. 20 – 29 YEARS
6. 30 YEARS OR MORE

6. What type of practice are you in?

1. SOLO
2. GROUP PRACTICE
3. PARTNERSHIP
4. ASSOCIATION
5. MILITARY
6. PUBLIC HEALTH
7. DENTAL EDUCATION

7. What type of dentistry do you mainly practice in?

1. GENERAL PRACTICE
2. ORTHODONTICS
3. PEDODONTICS
4. PERIODONTICS
5. ENDODONTICS
6. ORAL SURGERY
7. PROSTHODONTICS
8. CROWN AND BRIDGE

8. What is the average number of hours per week you spend seeing patients?

1. UP TO 25
2. 26 – 30
3. 31 – 35
4. 36 – 40
5. 41 – 49
6. OVER 50

9. Where is your practice located? Is it a....

1. RURAL AREA
2. SMALL URBAN AREA (e.g., Brandon, Thompson, etc.)
3. URBAN AREA (within Winnipeg city limits)

10. Which of the following broad categories describes your personal income and the income of all members of your household before taxes and deductions?

(Circle one) YOUR INCOME	(Circle one) HOUSEHOLD INCOME
1. LESS THAN $50,000	1. LESS THAN $50,000
2. $50,000 TO $74,999	2. $50,000 TO $74,999
3. $75,000 TO $99,999	3. $75,000 TO $99,999
4. $100,000 TO $124,999	4. $100,000 TO $124,999
5. $125,000 TO $149,999	5. $125,000 TO $149,999
6. $150,000 TO $174,999	6. $150,000 TO $174,999
7. $175,000 TO $199,999	7. $175,000 TO $199,999
8. $200,000 OR MORE	8. $200,000 OR MORE

You may have noticed that some sections in the questionnaire asked for information about how you have been feeling lately. Although these questions are not, and should not, be the sole means of diagnosing depression they do help highlight some of the most common depressive symptoms. These symptoms include;

1) Depressed mood;
2) significant weight loss or gain (more than 5% of your normal body weight) when not dieting;
3) disturbance in sleep patterns, whether insomnia (difficulty sleeping), or hypersomnia (excessive sleeping);
4) psychomotor agitation or retardation (generalized slowing of intentional body activity);
5) loss of interest or pleasure in usual activities;
6) loss of energy or fatigue;
7) feelings of worthlessness, or excessive or inappropriate guilt;
8) impaired thinking or concentration;
9) recurrent thoughts of death, or suicide, or a suicide attempt.

In comparison with other mental disorders, depression is a very common problem. In fact, it has been called the "common cold" of mental disorders. On the basis of available information it has been estimated that at any given time at least 4% of the adult population is sufficiently depressed to meet rigorous diagnostic criteria. It has also been estimated that 25-50% of the population will experience an episode of depression during their lifetime.

If you have been experiencing at least 5 of the aforementioned symptoms for most of the day, nearly everyday, in a two week period you might want to consider discussing this with your family physician.

Please turn to the back cover ...

Are there any other comments you wish to make that you think may help us in the future efforts to understand job stress and job satisfaction among dentists? If so, please use this space for that purpose.

Thank you for your time, the contribution you have made to this study is greatly appreciated. If you would like a summary of the results please place a tick (✓) in the box ☐.

Appendix B

Cover Letter for First Mailout

Dr. John Doe
111 Anywhere Street
Winnipeg, Manitoba
R0X 0X0

Dear Dr. Doe:

Job stress or "burnout" within the dental profession is becoming an ever increasing problem. Unfortunately, we have only a sketchy idea of how widespread the problem is, and what the factors are which lead to it's development. Research is needed to gain a better understanding of this problem and to aide in the development of effective prevention programs.

I am writing to request your help with such research. You, as well as all the other practicing dentists in the Province of Manitoba are being asked for your opinion on topics related to job satisfaction, job stress, and quality of life in the dental profession. In order that the results will truly represent the thinking of all Manitoba dentists, it is important that each questionnaire be completed and returned.

Although there is no obligation for you to take part in this research, I can assure you that your answers will be confidential. The questionnaire has an identification number for mailing purposes only. This is so that I may check your name off the mailing list when your questionnaire is returned. Your name will never be placed on the questionnaire.

This study is being conducted through the Department of Psychology at the University of Manitoba. The results of the study will be made available to the Manitoba Dental Association who hope to utilize the information in the development of an "at-risk" committee for the Manitoba dental community. You can receive a summary of results by checking the box on the back of your completed questionnaire. The questionnaire should be returned in the postage free envelope. If you have any questions about the study, please do not hesitate to contact me at (days) or (evenings).

Thank you for your assistance.

Sincerely,

D. Andrew Jones
Project Director

Appendix C

Manitoba Dental Association Support Letter

MANITOBA DENTAL ASSOCIATION
103 - 698 Corydon Avenue, Winnipeg, Manitoba R3M 0X9
Phone: (204) 453-0055
Fax: (204) 453-0108

1 March 1991

Dear Colleague:

Please find enclosed a questionnaire from Mr. D. Andrew Jones who is a Ph.D student in Clinical Psychology at the University of Manitoba. As indicated in his cover letter, Mr. Jones is interested in studying job stress and job satisfaction in the dental profession.

While there is no obligation for you to participate in this study, we are encouraging all Manitoba Dental Association members to do so because we believe that this research will be beneficial in at least two important ways. First, it will provide us with much needed information about the amount of stress dentists in Manitoba are experiencing. Second, it will help us with our development of an "at risk" committee and provide suggestions on how we may deal with stress. At the present time, we do not have any information to help us.

If you have any questions about this study please contact Mr. Jones at as he has indicated on his cover letter.

We hope you will complete the survey and return it as soon as possible.

Thank you for your help.

Yours truly

Tom Breneman, D.M.D.
President
Manitoba Dental Association

Appendix D

Postcard Reminder

Last week a questionnaire seeking your opinion about job stress and job satisfaction in the dental profession was mailed to you.

If you have already completed and returned it to me please accept my sincere thanks. If not, please do so today. Because it has been sent to only dentists in Manitoba it is extremely important that yours also be included in the study if the results are to accurately represent the opinions of all dentists in Manitoba.

If by chance you did not receive the questionnaire, or it got misplaced, please call me right now at and I will get another one in the mail to you today.

Sincerely,

D. Andrew Jones
Project Director

Appendix E

Cover Letter for Second Mailout

Dr. John Doe
111 Anywhere Street
Winnipeg, Manitoba
R0X 0X0

Dear Dr. Doe:

About three weeks ago I wrote to you seeking your opinion about issues related to job stress and satisfaction in the dental profession. As of today I have not received your completed questionnaire.

While I realize that completing this questionnaire will take approximately thirty minutes of your time, I hope you will see it as a contribution to the understanding of job stress in dentistry. We have undertaken this study because we believe that dentist's opinions should be considered in the development of stress prevention programs.

I am writing to you again because of the significance each questionnaire has to the usefulness of this study. In order for the results of this study to be truly representative of the opinions of all Manitoba dentists, I urge you to return your completed questionnaire. In the event that your questionnaire has been misplaced, a replacement, along with a postage paid return envelope is enclosed. If you have any questions about the study please feel free to call me at (days) or (evenings).

Your contribution to this research is greatly appreciated.

Sincerely,

D. Andrew Jones
Project Director