THE UNIVERSITY OF CALGARY

Measuring Dysfunctional Schemata in Anxiety and Depression Using Multidimensional Scaling: A Psychometric Investigation

by

William McConnell

A DISSERTATION

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE

DEGREE OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

CALGARY, ALBERTA

MAY, 1993

ISBN 0-315-88575-0

Name WILLIAM McCONNELL

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

PSYCHOLOGY
SUBJECT TERM

0525
SUBJECT CODE

U·M·I

Subject Categories

THE HUMANITIES AND SOCIAL SCIENCES

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

EDUCATION
General 0515
Administration 0514
Adult and Continuing 0516
Agricultural 0517
Art 0273
Bilingual and Multicultural 0282
Business 0688
Community College 0275
Curriculum and Instruction 0727
Early Childhood 0518
Elementary 0524
Finance 0277
Guidance and Counseling 0519
Health 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

Nom _____

Dissertation Abstracts International est organisé en catégories de sujets. Veuillez s.v.p. choisir le sujet qui décrit le mieux votre thèse et inscrivez le code numérique approprié dans l'espace réservé ci-dessous.

		U·M·I
SUJET		CODE DE SUJET

Catégories par sujets

HUMANITÉS ET SCIENCES SOCIALES

COMMUNICATIONS ET LES ARTS
Architecture 0729
Beaux-arts 0357
Bibliothéconomie 0399
Cinéma 0900
Communication verbale 0459
Communications 0708
Danse 0378
Histoire de l'art 0377
Journalisme 0391
Musique 0413
Sciences de l'information 0723
Théâtre 0465

ÉDUCATION
Généralités 515
Administration 0514
Art 0273
Collèges communautaires 0275
Commerce 0688
Économie domestique 0278
Éducation permanente 0516
Éducation préscolaire 0518
Éducation sanitaire 0680
Enseignement agricole 0517
Enseignement bilingue et multiculturel 0282
Enseignement industriel 0521
Enseignement primaire 0524
Enseignement professionnel 0747
Enseignement religieux 0527
Enseignement secondaire 0533
Enseignement spécial 0529
Enseignement supérieur 0745
Évaluation 0288
Finances 0277
Formation des enseignants 0530
Histoire de l'éducation 0520
Langues et littérature 0279
Lecture 0535
Mathématiques 0280
Musique 0522
Orientation et consultation 0519
Philosophie de l'éducation 0998
Physique 0523
Programmes d'études et enseignement 0727
Psychologie 0525
Sciences 0714
Sciences sociales 0534
Sociologie de l'éducation 0340
Technologie 0710

LANGUE, LITTÉRATURE ET LINGUISTIQUE
Langues
- Généralités 0679
- Anciennes 0289
- Linguistique 0290
- Modernes 0291

Littérature
- Généralités 0401
- Anciennes 0294
- Comparée 0295
- Médiévale 0297
- Moderne 0298
- Africaine 0316
- Américaine 0591
- Anglaise 0593
- Asiatique 0305
- Canadienne (Anglaise) 0352
- Canadienne (Française) 0355
- Germanique 0311
- Latino-américaine 0312
- Moyen-orientale 0315
- Romane 0313
- Slave et est-européenne 0314

PHILOSOPHIE, RELIGION ET THÉOLOGIE
Philosophie 0422
Religion
- Généralités 0318
- Clergé 0319
- Études bibliques 0321
- Histoire des religions 0320
- Philosophie de la religion 0322

Théologie 0469

SCIENCES SOCIALES
Anthropologie
- Archéologie 0324
- Culturelle 0326
- Physique 0327

Droit 0398
Économie
- Généralités 0501
- Commerce-Affaires 0505
- Économie agricole 0503
- Économie du travail 0510
- Finances 0508
- Histoire 0509
- Théorie 0511

Études américaines 0323
Études canadiennes 0385
Études féministes 0453
Folklore 0358
Géographie 0366
Gérontologie 0351
Gestion des affaires
- Généralités 0310
- Administration 0454
- Banques 0770
- Comptabilité 0272
- Marketing 0338

Histoire
- Histoire générale 0578
- Ancienne 0579
- Médiévale 0581
- Moderne 0582
- Histoire des noirs 0328
- Africaine 0331
- Canadienne 0334
- États-Unis 0337
- Européenne 0335
- Moyen-orientale 0333
- Latino-américaine 0336
- Asie, Australie et Océanie 0332

Histoire des sciences 0585
Loisirs 0814
Planification urbaine et régionale 0999
Science politique
- Généralités 0615
- Administration publique 0617
- Droit et relations internationales 0616

Sociologie
- Généralités 0626
- Aide et bien-être social 0630
- Criminologie et établissements pénitentiaires 0627
- Démographie 0938
- Études de l' individu et de la famille 0628
- Études des relations interethniques et des relations raciales 0631
- Structure et développement social 0700
- Théorie et méthodes 0344
- Travail et relations industrielles 0629

Transports 0709
Travail social 0452

SCIENCES ET INGÉNIERIE

SCIENCES BIOLOGIQUES
Agriculture
- Généralités 0473
- Agronomie 0285
- Alimentation et technologie alimentaire 0359
- Culture 0479
- Élevage et alimentation 0475
- Exploitation des pâturages 0777
- Pathologie animale 0476
- Pathologie végétale 0480
- Physiologie végétale 0817
- Sylviculture et faune 0478
- Technologie du bois 0746

Biologie
- Généralités 0306
- Anatomie 0287
- Biologie (Statistiques) 0308
- Biologie moléculaire 0307
- Botanique 0309
- Cellule 0379
- Écologie 0329
- Entomologie 0353
- Génétique 0369
- Limnologie 0793
- Microbiologie 0410
- Neurologie 0317
- Océanographie 0416
- Physiologie 0433
- Radiation 0821
- Science vétérinaire 0778
- Zoologie 0472

Biophysique
- Généralités 0786
- Medicale 0760

SCIENCES DE LA TERRE
Biogéochimie 0425
Géochimie 0996
Géodésie 0370
Géographie physique 0368
Géologie 0372
Géophysique 0373
Hydrologie 0388
Minéralogie 0411
Océanographie physique 0415
Paléobotanique 0345
Paléoécologie 0426
Paléontologie 0418
Paléozoologie 0985
Palynologie 0427

SCIENCES DE LA SANTÉ ET DE L'ENVIRONNEMENT
Économie domestique 0386
Sciences de l'environnement 0768
Sciences de la santé
- Généralités 0566
- Administration des hôpitaux 0769
- Alimentation et nutrition 0570
- Audiologie 0300
- Chimiothérapie 0992
- Dentisterie 0567
- Développement humain 0758
- Enseignement 0350
- Immunologie 0982
- Loisirs 0575
- Médecine du travail et thérapie 0354
- Médecine et chirurgie 0564
- Obstétrique et gynécologie 0380
- Ophtalmologie 0381
- Orthophonie 0460
- Pathologie 0571
- Pharmacie 0572
- Pharmacologie 0419
- Physiothérapie 0382
- Radiologie 0574
- Santé mentale 0347
- Santé publique 0573
- Soins infirmiers 0569
- Toxicologie 0383

SCIENCES PHYSIQUES
Sciences Pures
Chimie
- Généralités 0485
- Biochimie 487
- Chimie agricole 0749
- Chimie analytique 0486
- Chimie minérale 0488
- Chimie nucléaire 0738
- Chimie organique 0490
- Chimie pharmaceutique 0491
- Physique 0494
- PolymÇres 0495
- Radiation 0754

Mathématiques 0405
Physique
- Généralités 0605
- Acoustique 0986
- Astronomie et astrophysique 0606
- Electronique et électricité 0607
- Fluides et plasma 0759
- Météorologie 0608
- Optique 0752
- Particules (Physique nucléaire) 0798
- Physique atomique 0748
- Physique de l'état solide 0611
- Physique moléculaire 0609
- Physique nucléaire 0610
- Radiation 0756

Statistiques 0463

Sciences Appliqués Et Technologie
Informatique 0984
Ingénierie
- Généralités 0537
- Agricole 0539
- Automobile 0540
- Biomédicale 0541
- Chaleur et ther modynamique 0348
- Conditionnement (Emballage) 0549
- Génie aérospatial 0538
- Génie chimique 0542
- Génie civil 0543
- Génie électronique et électrique 0544
- Génie industriel 0546
- Génie mécanique 0548
- Génie nucléaire 0552
- Ingénierie des systämes 0790
- Mécanique navale 0547
- Métallurgie 0743
- Science des matériaux 0794
- Technique du pétrole 0765
- Technique minière 0551
- Techniques sanitaires et municipales 0554
- Technologie hydraulique 0545

Mécanique appliquée 0346
Géotechnologie 0428
Matières plastiques (Technologie) 0795
Recherche opérationnelle 0796
Textiles et tissus (Technologie) 0794

PSYCHOLOGIE
Généralités 0621
Personnalité 0625
Psychobiologie 0349
Psychologie clinique 0622
Psychologie du comportement 0384
Psychologie du développement 0620
Psychologie expérimentale 0623
Psychologie industrielle 0624
Psychologie physiologique 0989
Psychologie sociale 0451
Psychométrie 0632

THE UNIVERSITY OF CALGARY

FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a dissertation entitled, "Measuring Dysfunctional Schemata in Anxiety and Depression Using Multidimensional Scaling: A Psychometric Investigation" submitted by William McConnell in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Supervisor, Dr. H. A. Altmann
Department of Educational Psychology

Dr. C. Violato
Department of Educational Psychology

Dr. K. J. Mothersill
Department of Psychology

Dr. K. S. Dobson
Department of Psychology

External Examiner, Dr. M. M. Moretti
Simon Fraser University

May 18/93
Date

ABSTRACT

A multidimensional scaling procedure was developed as a measure of dysfunctional semantic schemata in clinical anxiety and depression. The procedure consisted of a card sort of eighteen events that respondents were asked to sort on the basis of perceived similarity. The items were derived from a pool of events that had been experienced as upsetting by a sample of depressed or anxious patients.

The procedure's psychometric properties were investigated in two studies. In the first, it was administered to clinically anxious and/or depressed (n = 29) and to non-anxious/depressed (n = 22) adult participants. A test-retest reliability coefficient of .74 was obtained from the analysis of the stability of twenty participants' similarity judgements over a two week period. Evidence of content validity was demonstrated in the scaling solution obtained from the anxious/depresseds' initial judgements, in that the three dimensions were conceptualized as semantic schemata defined by the theoretically interpretable themes of Inferiority, Autonomy, and Dependency. Evidence of discriminant validity was demonstrated in the distinct three dimensional solution obtained from the non-anxious/ depresseds' initial judgements.

In the second study, cognitive therapists identified the most clinically relevant schemata for thirteen patients who had participated in the first study. Three raters

estimated the agreement between the therapists' judgements and the participants' highest weighted dimensions. Partial evidence of predictive validity was demonstrated in kappa coefficients of .29, .53, and .65.

The results were considered to have provided evidence of construct validity, and it was concluded that the scaling procedure represents a promising method for measuring clinically salient schemata.

ACKNOWLEDGEMENTS

It is a privilege to acknowledge my supervisory committee for contributing to a highly rewarding and enriching educational experience. In particular, I would like to thank Dr. Altmann for his commitment, guidance, and encouragement, Dr. Violato for his advice on statistical and psychometric issues, and Dr. Mothersill for his help in gaining access to data, participants, and facilities at the Holy Cross Hospital.

I would also like to thank the clinicians who made the initial contacts with participants in the anxious/depressed group, the participants who volunteered for the first study, and the clinicians and raters in Calgary and Grande Prairie who provided data for the second validation study.

Finally, I would like to thank Susan. My efforts would have been unsuccessful without her love and support.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

Introduction

Aaron Beck was a catalyst in the development of the cognitive-behavioural paradigm, and his approach, Cognitive Therapy, has emerged as one of its most significant elements. The model has generated considerable research into the cognitive processes involved in depression (Haaga, Dyck, & Ernst, 1991), and outcome studies present it as a viable alternative to antidepressant medication (Hollon, Shelton, & Loosen, 1991). The model has also been extended to address anxiety, marital, and personality disorders (Beck, 1988; Beck & Emery, 1985; Beck & Freeman, 1990), derivatives have made an impact within the self-help literature (e.g., Burns, 1980), and various centres offer training in the approach throughout North America.

In keeping with the cognitive-behavioural paradigm, Beck emphasizes the role of cognitive processes in the production and maintenance of emotional disturbance. The schema is his most important explanatory construct. Essentially, schemata are thought to play a causal role in the onset and maintenance of disorder, and, as such, are thought to represent vulnerability markers for disturbance (Clark & Beck, 1989).

Schemata are central constructs in other cognitive-behavioural models (e.g., Meichenbaum, 1985), and within the fields of social cognition and cognitive psychology

(Rummelhart, 1984; Taylor & Crocker, 1981). They are typically defined as memory structures that are involved in the comprehension of new information (Winfrey & Goldfried, 1986), and are considered adaptive in that they allow inferences to be made about the information (Brewer & Nakamura, 1984). While there is obvious economy in using existing knowledge in the construction of interpretations of the environment, it is generally accepted that schemata introduce the risk of distorting incoming information to fit the existing knowledge. One of the better known examples of this phenomenon is found in Bartlett's Remembering (1932), in which it was reported that British students' recall of the North American Indian folk-tale "War of the Ghosts" conformed more to familiar narrative structure, than to the original unusual format.

Beck argues that "dysfunctional" schemata are ordinarily latent, and distort information-processing only during periods of disturbance (Beck, 1991). They are thought to contain relatively unrealistic and inflexible beliefs about self-worth that take the form of conditional rules (e.g., "Unless I am loved by all, I am nothing"). It is also thought that each disturbed individual has a "core" constellation of thematically related schemata, and that a limited number of themes predispose to both anxiety and depression (Beck, 1987; 1991).

When activated (often by failure to fulfill the

contingent behavioural scenario), it is hypothesized that the associated beliefs are generated (e.g., "I am nothing"), which, in turn, lead to negative emotional reactions such as anxiety and sadness. It is also hypothesized that the activated schemata continue to be used in encoding an ever increasing amount of new situations, leaving the individual less open or responsive, to alternative, and probably more adaptive, interpretations (Safran, Segal, Hill, & Whiffen, 1990).

Beck argues that it is important to identify and modify clients' core dysfunctional schematic organizations if one wishes to reduce probability of relapse (Beck, Rush, Shaw, & Emery, 1979; Beck & Emery, 1985). Consistent with the generally held view that schemata operate in a relatively automatic and nonconscious manner (Brewer & Nakamura, 1984), he suggests that although clients are usually all too aware of the resultant self-perceptions and emotional reactions, they are usually unaware of the existence or influence of the underlying schemata (Beck, 1976). Identification of schemata, then, involves a process of inferring schematic content from the recurring themes or patterns that emerge in the ongoing analyses of the clients' perceptions of experience (DeRubies & Beck, 1988). Development of measures to facilitate this relatively time-consuming process is considered an important objective for improving the practice of cognitive therapy (Safran, Vallis, Segal, & Shaw, 1986).

There is an additional reason why the development of dysfunctional schema measures is considered an important objective. In contrast to the demonstrated efficacy of cognitive therapy, attempts to validate the hypothesized role of schemata in the onset and maintenance of disorder have been unsuccessful (Barnett & Gotlib, 1988; Haaga et al., 1991). This failure tends to underscore the position of critics who argue that while the schema provides what Frank (1985) would call a powerful therapeutic "myth and ritual", it should, nevertheless, be considered metaphorical, or a mood state-dependent cognition (Brewin, 1989; Coyne & Gotlib, 1986).

Advocates of Beck's model have argued that empirical examinations of the proposed role of schemata have used inadequate measures (e.g., often relying on self-report instruments), and have called for the development of more appropriate instruments (Alloy, Hartlage, & Abramson, 1988; Dobson & Shaw, 1987; Safran et al., 1990; Segal, 1988). Various authors have drawn attention to the potential of multidimensional scaling (MDS) procedures (e.g., Landau & Goldfried, 1981; Merluzzi & Boltwood, 1989; Robins, 1987; Safran et al., 1986; Segal & Shaw, 1988).

Conceptually similar to factor analysis, these statistical procedures generate spatial representations of the proximities among stimuli. They are frequently used to represent perceived similarity among stimuli, to identify

the implicit dimensions involved in the similarity judgements, and to quantify the weighting, or relative importance, of each dimension for each respondent (Fitzgerald & Hubert, 1987).

MDS appears suited for measuring schemata in that identifying the implicit dimensions underlying judgements of similarity is analogous to identifying the encoding or categorization function of the schemata that are used to construe the objects (Robins, 1987). Moreover, identifying individual dimension weights is analogous to identifying idiosyncratic schematic organization.

There is some empirical support for the promise of MDS. Two studies, for example, used MDS to identify the schemata used by sub-clinical socially anxious male undergraduates in similarity judgements of heterosexual encounters (Goldfried, Padawer, & Robins, 1984; Robins, 1987). The dimensional solutions in both studies were considered compatible with prevailing perspectives on social anxiety.

A psychological measure is typically deemed adequate if it can be established that it is both reliable and valid (Cronbach, 1984). Reliability refers to consistency of measurement and is often assessed by analyses of stability of measurement over time. Validity refers to the extent to which the measure can be shown to have measured the intended construct, and is assessed by methods such as establishing whether it samples the intended domain (content validity),

whether it correlates highly with an independent criterion or alternate measure of the construct (criterion-related validity), and whether it has relatively low correlations with measures of distinct constructs (discriminant validity).

This dissertation describes the development of an MDS procedure as a measure of dysfunctional schemata in clinical anxiety and depression, and an investigation of its reliability and validity. The research was based on a number of assumptions.

First, it was assumed that the dysfunctional schematic themes that are thought to be involved in anxiety and depression would be identifiable, given an appropriate stimulus selection, in a dimensional solution generated from administration of the procedure to clinically anxious and/or depressed participants. Second, it was assumed that dysfunctional schemata are active only during episodes of clinical depression and anxiety, and that a different solution would be obtained when administered to participants who were neither anxious nor depressed. Third, it was assumed that the schemata identified in therapy by cognitive-behavioural therapists could serve as a reasonable criterion in an analysis of criterion validity.

Establishing that an instrument is valid involves gradual accumulation of supporting evidence (Goldberg & Shaw, 1989). The project was not, therefore, conceptualized

as a definitive study. Four criteria were established to conduct an initial appraisal of the procedure's psychometric properties. These criteria were: (1) the procedure should generate evidence of temporal stability in a test-retest reliability analysis; (2) the procedure should generate evidence of content validity by producing dimensions/ schemata that are consistent with Beck's theory; (3) the procedure should generate evidence of discriminant validity by producing a different dimensional solution when administered to non-anxious and/or depressed participants; and (4) the procedure should generate evidence of criterion-related validity by predicting the "core" schemata of those participants who received cognitive therapy.

CHAPTER 2

Review of the Literature

This chapter begins with a description of the operational definition of dysfunctional schema that was used in the research. The definition is then used as a basis for evaluating the validity of the criticisms of existing schema measures, and to discuss the reasons why MDS appears to offer a more appropriate method for measurement.

Establishing an Operational Definition

Review of Beck's Definition of Schema

Beck defines the dysfunctional schema as a memory structure that processes information relating to self-evaluation and interpersonal relationships (Kovacs & Beck, 1978). It is thought to be used in a constructive fashion to comprehend and interpret the environment, insofar as it is "used to label, classify, interpret, evaluate, and assign meanings to objects and events" (Beck & Emery, 1985, p. 55).

Beck further defines the dysfunctional schema by emphasizing a number of structural properties. Valence refers to the extent to which the schema is mobilized in information processing at any given time, which can range from relative absence of activity, to significant activity or hypervalence whereby the schema "channel(s) cognitive processes from the earliest to the final stages" (Beck & Freeman, 1990, p.32). Breadth refers to the extent to which the schema is involved in processing relatively narrow or

large ranges of stimuli or situations (Beck, 1967), density to the schema's relative importance in the cognitive system (Beck & Freeman, 1990), and flexibility to the extent to which it is capable of modification (Beck, 1967).

Although the schema is discussed in terms of structural properties such as flexibility or density, the most emphasized quality is content. Beck argues that dysfunctional schemata contain important personal rules, which have been referred to as "silent assumptions", "formulas", and "dysfunctional attitudes" (Kovacs & Beck, 1978). The dysfunctional attitude has become the preferred term, and is usually described as having a conditional quality. It may, however, be predicated on a more fundamental or basic belief (Beck & Freeman, 1990; Beck & Emery, 1985). For example, the attitude "my happiness depends on being accepted by everyone" may be based on an underlying sense of self as "unlovable".

Beck distinguishes his perspective from Ellis' position on irrational beliefs (e.g., Ellis, 1987) by arguing that dysfunctional attitudes are not inherently irrational, and are only dysfunctional to the extent that they are "too absolute, broad, and extreme; too highly personalized; and are used too arbitrarily to help the patient . . . handle the exigencies of his life" (Beck, 1976, p. 246). Although he describes these attitudes as integral to identity (Beck et al., 1979), it is thought that the individual often lacks

awareness of them, even when used in information-processing (Beck, 1976; Beck & Emery, 1985).

Beck (1976) originally suggested that each psychiatric disorder was associated with unique dysfunctional schemata (the content-specificity hypothesis), but recently revised his position for depression and anxiety by arguing that the same attitudes predispose to both conditions. The specific emotional reaction is determined by the nature of the precipitating event (Beck, 1991):

> It should be emphasized that [in depression] the predisposing schema ("I need to be loved in order to be happy") becomes salient only after the person makes the judgement that he or she is not loved by a particular key person. In cases of anxiety disorder, the same schema ("I need to be loved . . . ") becomes dominant when there is a perceived danger of losing the loved person. (p. 22)

Two themes have been emphasized in descriptions of anxiety and depression; sociotropy and autonomy (Beck, 1983; 1987). These themes are generally considered important in depression (Arieti & Bemporad, 1980; Blatt, Quinlan, Chevron, McDonald, & Zuroff, 1982; Hirschfeld, Klerman, Gough, Barret, Korchin, & Chodoff, 1977; Nietzel & Harris, 1990). Sociotropic individuals are thought to derive much of their self-worth from maintaining harmonious

interpersonal relationships, and are liable to become depressed when relationships are disrupted, and anxious upon encountering threat of disruption. When depressed, they are prone to blame their loss on personal, socially undesirable characteristics, and are also prone to experience emotional lability. Autonomous individuals, in contrast, derive most of their self-worth from achievement and independence, and are particularly susceptible to events that block or threaten their goals. When depressed, their sense of having failed, or of having restricted control, leads to significant self-castigation and to a general sense of powerlessness (Beck, 1983; 1991).

Beck and Emery (1985) have described related themes in anxiety disorders: acceptance, competence, and control. Acceptance describes beliefs or attitudes that relate to concerns about being flawed and unacceptable, competence to attitudes that are grounded in a sense of inferiority, and control to concerns about being dominated and of losing independence. They claim that anxious patients tend to have concerns in all three areas, but nevertheless have one dominant theme.

While an appropriate event-schema match may constitute a sufficient proximal causal variable in the onset of disorder, Beck (1991) argues against attempts to portray the schema as a necessary variable in the process:

> Other writers have assumed that I regarded the [activated schema] as the "cause" of depression. However, I have considered the activation of schemas to be a mechanism by which the depression develops not as the cause. The cause may be in any combination of biological, genetic, stress, or personality factors . . . . (p. 371)

Once activated, however, the schema is considered to represent a causal driving mechanism in the maintenance of disturbance, in that it is hypothesized that it is used to interpret an increasingly wide and possibly unrelated array of events, with a corresponding loss of balance or objectivity. This results in frequent activation of dysfunctional attitudes, which, in turn, produce dysphoric affective reactions. For example, the sociotropic individual (who may have become depressed after having experienced rejection), will remain depressed as a result of the dysfunctional schema's rigid and inflexible application to a variety of ongoing situations: As Beck (1967) puts it, "the . . . (dysfunctional) schemas continually grind out the depressive cognitions that crowd out the nondepressive cognitions" (p. 286).

Critique of Beck's Position

By defining schema as a memory structure that is involved in the development of disturbance, it would appear that Beck's definitions should be treated as literal rather

than metaphorical. At issue, then, is whether he provides sufficient information for an operational definition.

In addressing this issue it is important to recognize that although frequently referred to within the cognitive, social, and clinical psychology literature since the mid-1970's, and although frequently portrayed as a significant variable in the encoding process, the term schema has tended to be used with varying definitions (Benjafield, 1992; Winfrey & Goldfried, 1986).

Williams, Watts, MacLeod, and Mathews (1988) recently reviewed definitions from cognitive psychology and artificial intelligence in order to offer core definitional criteria, and it has been recommended that their definition serve as a standard in clinical research (Safran et al., 1990). They define schema as a knowledge structure that is used to encode, comprehend, and retrieve information. It contains generic, prototypical, abstractions of experience, and has consistent internal structure that is imposed on new information, causing it to be organized in stereotypical ways. The schema is also considered modular, in that activation of any content element leads to activation of all content.

Williams et al. reviewed Beck's definitions and noted that his emphasis on the manner in which dysfunctional schemata stereotypically distort processing after periods of inactivity implies the notion of consistent internal

structure and modularity. Thus Beck's use of the construct appears compatible with mainstream formulations. However, they also suggest that it is unclear whether he considers content to be generic, and argue that this lack of clarity is problematic in that it renders tests of his model somewhat difficult. This criticism has been echoed by other authors who have called attention to the vagueness of many of Beck's hypotheses (e.g., Hammen, 1988; Stiles & Gotestam, 1988).

For example, although Beck refers to the dysfunctional attitude as a generalization drawn from experience (Beck, 1976), he does not elaborate on the nature of the remaining content within the dysfunctional schema. Given that a situation must be recognized in order for the dysfunctional attitude to become operative, it is clear that it should be assumed that at least some of this content involves representations of past episodes. Whether the representations describe specific episodes (as has been alluded to in Kovacs & Beck, 1978), or combine to form a prototypical representation of the general attributes of "difficult" situations, remains unclear.

This ambiguity is particularly problematic when trying to understand the means by which dysfunctional schemata are involved in the onset of disorder: If content is highly situation-specific, how close an approximation to the original scenario must an activating event be? It is also

problematic when trying to consider the means by which the same dysfunctional attitude can produce either a depressive or anxious reaction. Although Beck claims that the difference in reaction can be traced to differences in the nature of the activating events (i.e., "loss" versus "threat" events), he does not elaborate on the precise nature of the schematic mediation involved in both onset and maintenance of each condition. It is not clear, for example, whether the same schema, or separate but related schemata, are involved in the ongoing misrepresentation of events as constituting loss or the threat of loss.

In order to establish an operational definition that is consistent with Beck's position, it would appear necessary to resolve some of this ambiguity. Specifically, it appears necessary to develop a more precise position on content, and on the mechanisms by which the same dysfunctional attitude can produce either anxiety or depression. This can be achieved by considering the dysfunctional schema's structure and process in more detail.

A Proposed Operational Definition

Structure. It is generally assumed by theorists that schemata are organized in hierarchies that are arranged according to increasing levels of generality (Winfrey & Goldfried, 1986). Landau & Goldfried (1981) drew upon the work of Neisser (1976, 1978), Schank and Abelson (1977), and Thorndyke and Hayes-Roth (1979) to propose a hierarchical

typology of schemata.

Situated at the bottom of any hierarchy are "semantic" schemata which are used to recognize and categorize objects and events. Embedded within the hierarchy are more general types of functionally related schemata such as "situational scripts" and "plans". These contain information about the kinds of behaviour that can be expected in a particular situation and about means to obtain particular goals. Landau and Goldfried suggest that we have numerous hierarchies and that each is organized by its relation to a theme. Themes are not necessarily represented within the hierarchy, and are defined as:

> higher order abstractions of specific sets of goals (e.g., the need to be approved of by all the people with whom one interacts), [which] can have a strong influence on the kinds of schemata that are likely to come into repeated use. (p. 370)

Landau and Goldfried's portrayal of hierarchies offers a useful way to conceptualize the relevant dysfunctional schematic organization in those predisposed to disturbance, and is, in fact, quite similar to a recent articulation of Beck's position in which he suggests that schemata can be classified according to the specific intrapersonal system that each is involved with (Beck & Freeman, 1990):

> the cognitive schemas are concerned with abstraction, interpretation, and recall; the

> affective schemas are responsible for the generation of feelings, the motivational schemas deal with wishes and desires; the instrumental schemas prepare for action, and the control schemas are involved with self-monitoring and inhibiting or directing actions. (p.33)

It is hypothesized here, then, that the "dysfunctional schema" should be considered to be an element of a larger hierarchical schematic constellation. It is also hypothesized that each hierarchy contains functionally related schemata for recognizing situations that relate to goal satisfaction (semantic or cognitive schemata), and general and specific schemata about how to respond once these situations are recognized and about how to engage in behaviours that might produce desired situations (scripts and plans, or instrumental and control schemata). It is further hypothesized that each hierarchy is defined by a theme, or motivational schema. Sociotropic individuals, for example, should have hierarchies containing scripts and plans that determine characteristic means of achieving their goals of relatively absolute acceptance, and semantic schemata for determining whether their goals were met, and for identifying situations that might affect the goals.

Given that clinically relevant hierarchies are defined by excessively rigid goals, all elements could be considered "dysfunctional". It would appear, however, that the typical

portrayal of the dysfunctional schema as the prime variable in the misperception of events strongly suggests that it should be understood to be a semantic schema. It would also appear that what is commonly defined as its content, the dysfunctional attitude, should be understood to be a separate and distinct proposition that exists as a derivative element of the hierarchy's organizing theme.

Process. Brewer and Nakamura's (1984) review of the nature and function of schemata is instructive in considering the mechanisms by which dysfunctional schematic constellations can be understood to operate in anxiety and depression. They argue that schemata unconsciously interact with incoming information through one of two basic processes:

> (a) the modification of the generic knowledge in the relevant schema; (b) the construction of a specific instantiated memory representation. An instantiated schema is a cognitive structure that results from the interaction of the old information of the generic schema and the new information from the episodic input. (p. 141)

Because Beck argues that dysfunctional schemata are relatively rigid, and are therefore, presumably, resistant to accommodation, it is most likely that they operate according to the second process. Thus, when a dysfunctional semantic schema is used to label a situation it should

create a mental representation that incorporates both generic elements, and specific qualities of the perceived situation.

Furthermore, because Beck argues that the nature of the activating event produces different emotional reactions in those with similar dysfunctional attitudes, and has emphasized the relative independence of the cognitive and affective systems, it is reasonable to assume that the same generic semantic schema is used to label the stressful events and that emotional divergence occurs as a function of differences in the invoked instantiations. It is, of course, possible that separate semantic schemata exist for recognizing subtraction from one's domain as well as for recognizing threat of subtraction, but it is more parsimonious to imagine that the same schema would handle both situations. The dysfunctional semantic schema, then, would contain a generic representation of the type of situation that would have negative implications for the core goal, and the nature of the activating event would dictate the specific qualities of the instantiation, and the corresponding emotional reaction.

For example, after experiencing rejection, the sociotropic individual might develop an instantiation that produces the idea "I have been rejected and therefore I am nothing". In contrast, exposure to an event that is perceived as involving the possibility of rejection might

result in an instantiation producing the idea "I am in imminent danger of being rejected, and therefore my self-worth is in jeopardy". It is assumed in both instances, that, in keeping with the notion of the hierarchy as a modular structure, the dysfunctional attitude would automatically become operative when the relevant semantic schema is activated. Each hypervalent instantiation would continue to be used in interpreting ongoing experience, and the resultant perception of self that arises from this process (i.e., as having lost, or as vulnerable to loss) would trigger different patterns of activity within the affective, motivational, and behavioural systems, corresponding to the syndromes of anxiety and depression.

Summary

The operational definition of dysfunctional schema that was used in the research is as follows: it is a semantic schema that exists within a hierarchy that is functionally defined by a personally relevant superordinate goal, such as sociotropy or autonomy. It is a modular structure that contains generic representation of the prototypical scenario that constitutes failure to fulfill the contingencies for self-worth that are represented within dysfunctional attitudes. Dysfunctional attitudes do not constitute any element of dysfunctional semantic schemata, but exist, rather, as separate propositions within the hierarchy, or in relation to it.

Dysfunctional schemata exist to define novel situations and are active only during episodes of clinical disturbance. When active, they construct numerous stereotypical instantiations of perceptions of personal "failure", and this in turn automatically activates the beliefs contained in the functionally related dysfunctional attitudes.

Critique of Existing Schema Measures

Psychometric Issues

Psychological measures are typically considered adequate if it can be established that they are both reliable and valid. Reliability is defined as consistency of measurement, and can be determined in one of two ways. In the test-retest method, reliability is conceptualized in terms of temporal stability, and is calculated by correlating the scores obtained from repeat administrations of the measure. In the second method, reliability is conceptualized as the degree of response consistency across all test items from single administrations. The internal consistency coefficient can be calculated by determining the correlation between half-test scores (the split-half method), or by determining the ratio of item covariances to the total observed score variance (Crocker & Algina, 1986; Cronbach, 1984).

A measure is considered valid when it is established that evidence supports the inferences that are to be drawn from respondents' scores. Historically, this has been

addressed in one of three ways (Cronbach, 1984). Content validation involves determination of the extent to which the test items are considered representative of the intended construct. This has usually been achieved by asking experts to rate the degree of representativeness.

Criterion-related validation involves determination of the extent to which the measure predicts performance on a behavioural variable that is considered to be of practical importance (the criterion). When administration of the measure and assessment of the criterion occur at approximately the same time the research is defined as concurrent validation. When the assessments are separated by a significant amount of time it is considered predictive validation. In either case, the correlation between the measure and criterion is defined as the validity coefficient, and a significant coefficient is considered evidence of validity (Cronbach, 1984).

Construct validation involves determination of the extent to which test performance is consistent with the theoretical construct that it is assumed to measure, and requires compilation of multiple sources of evidence (Crocker & Algina, 1986). Cronbach (1984) argues that the essence of construct validation is addressed by determining the measure's convergence with accepted measures of the construct (convergent validity), and its divergence from measures of distinct constructs (discriminant validity).

Ideally, one expects high convergent validity coefficients, and low discriminant validity coefficients (Campbell & Fiske, 1959).

Construct validity can also be examined by demonstrating that performance on the measure is affected by theoretically predicted manipulations, or by determining whether the results of factor analyses of test items are theoretically consistent.

The Dysfunctional Attitude Scale

The majority of empirical investigations of the role of dysfunctional schemata have focused on the content of depressogenic schemata, and have used one of two measures. The first, the Dysfunctional Attitude Scale (DAS; Weissman, 1979), consists of two 40-item self-report inventories. The items were generated from a pool of beliefs that were identified in cognitive therapy, and consist of statements describing contingencies for self-worth to which respondents indicate the extent of their agreement.

Weissman (1980) examined the DAS's psychometric properties in an undergraduate sample. She reported high internal consistency (.89 - .92) and test-retest coefficients (.80 - .84), significant positive correlations with depressed mood inventories (.36 - .44), and a significant positive correlation with a measure of negative cognitive processing (.52). She concluded that the DAS was both reliable and valid.

Comparisons of clinically depressed and controls' completions of the DAS began to appear in the early 1980's, and significant group differences were typically reported. The depresseds' higher mean scores were interpreted in favour of Beck's position on the valence of dysfunctional schemata (e.g., Eaves & Rush, 1984).

More ambiguous results were obtained in longitudinal designs. While Eaves and Rush (1984) reported that DAS scores remained elevated in recovered depressives, Hamilton and Abramson (1983) reported a drop to a level that was equivalent to their control mean. The majority of subsequent studies corroborated Hamilton and Abramson's findings (e.g., Hollon, Kendall, & Lumry, 1986; Silverman, Silverman, & Eardley, 1984), and the results of Eaves and Rush were attributed to the possibility that their subjects may not have been fully recovered (e.g., Coyne, 1989). A consistent pattern was emerging then, which suggested that dysfunctional schemata were simply mood state-dependent cognitions, and not stable features of personality.

A number of authors responded by noting that Beck had proposed that schemata may be inactive during periods of normal functioning, and argued that demonstrations of the schema's enduring nature as a vulnerability marker should involve assessment of stability within periods of naturally occurring depressed mood, or after administration of "priming" strategies such as mood-induction (e.g., Riskind &

Rholes, 1984).

Miranda and Persons recently examined this question in a series of studies, and reported that subjects with a history of depression (and who were thereby classifiable as vulnerable to the disorder) obtained higher DAS scores than subjects with no history, but only during periods of naturally occurring and induced depressed mood (Miranda & Persons, 1988; Miranda, Persons, & Byers, 1990).

Nevertheless, significant concerns about the DAS's validity remain. Segal (1988), for example, accepts that the DAS is a useful measure of important negative cognitions, but argues that one need not assume that they constitute the contents of schemata. The attitudes may consist of elements that are linked to emotion nodes that exist within a larger propositional network. As such, they would automatically become available with every experience of depressed mood.

A second concern relates to the question of whether dysfunctional attitudes can be measured reliably by self-report. Most commentaries on the therapeutic process argue that the "silent beliefs" can only be identified through a relatively time-consuming process of inference (e.g., Beck et al., 1979; DeRubeis & Beck, 1988; Safran et al., 1986). It is interesting that approximately half of the depressed subjects in Hamilton and Abramson's study had DAS scores equivalent to those of controls. Although it could be

argued that dysfunctional schemata are vulnerability markers for only a subset of those who become depressed, Beck has categorically stated that schemata are implicated in all depressions (Beck, 1984; Haaga & Beck, 1992). From the perspective of the cognitive model, then, failure to produce elevated scores in all depressives suggests that the DAS is less than adequate as a measure of schematic content.

The DAS continues to be used in investigations of cognitive explanations of disturbance (Persons, Miranda, & Perloff, 1991; Segal, Shaw, & Vella, 1989; Segal, Shaw, Vella, & Katz, 1992). It now tends to be scored and interpreted on the basis of factor structure, and is used as a measure of beliefs and attitudes related to variables such as sociotropy and autonomy rather than the content of dysfunctional schemata. Although the separation of dysfunctional attitudes from the content of semantic schemata is consistent with the operationalization used in this project, and although the use of factor scores over total DAS scores may offer a more appropriate approach for measuring specific vulnerabilities (Barnett & Gotlib, 1988), the validity of the instrument's use for this new purpose has yet to be fully established. It is not clear, for example, whether it is appropriate to use factors that have been identified in a non-patient population (Cane, Olinger, Gotlib, & Kuiper, 1986; Oliver & Baumgart, 1985). It is also not clear whether changing the target of measurement

avoids the limitations of a self-report format, in that it cannot simply be assumed that respondents are aware of their driving motives and beliefs.

The Self-Referent Encoding Task

The second principle schema measure, the self-referent encoding task (SRET), effectively avoids the limitations of a self-report format, in that content is inferred from analyses of processing effects.

Participants are presented with lists of positive and negative trait adjectives, and are asked to make a number of judgements, such as whether they are self or other descriptive. Decision latencies are usually recorded, as are the words remembered in an incidental recall trial (Segal, 1988). It has typically been reported that depressed participants tend to endorse more of the negative adjectives as self-descriptive, and that they exhibit enhanced recall of these words. This contrasts with controls who tend to endorse and recall more positive words (Kuiper, Olinger, & MacDonald, 1988).

These findings have been attributed to the operation of self-schemata. The self-schema has been increasingly referred to within the clinical psychology and social cognition literature, and has been defined as "an organized self-structure of interrelated . . . constructs" (Segal, 1988, p. 150). The typical SRET results are attributed to efficient schematic processing of personally relevant

information, and the group differences are thought to reflect differences in self-schema content, with the depressed exhibiting "negative" or "depressive" self-schemata (Kuiper et al., 1988).

Most studies have used the SRET in cross-sectional designs. Dobson and Shaw (1987) used a longitudinal design, and reported that the performance of recovered depressives was essentially indistinguishable from controls. They concluded that the SRET was an inadequate measure of a supposedly stable construct. However, in keeping with a design that was sensitive to the issue of priming, Teasdale and Dent (1987) reported that subjects with a history of depression exhibited enhanced processing of negative trait adjectives, but only after administration of a mood induction procedure.

Nevertheless, the adequacy of the SRET remains open to question. One issue relates to precision of measurement. Although it would appear capable of identifying "negative" cognitions, it fails to provide sufficiently detailed information for the clinician or researcher who is interested in individual differences in the content of pathogenic schemata, or in the nature of related dysfunctional beliefs.

Questions have also been raised about the measure's validity. Both Segal (1988) and Williams et al. (1988) have argued that the SRET cannot be used to verify the existence

of the self as a unified schematic structure, because, as with the DAS, it does not allow a distinction to be made between schematic and mood-congruent processing. That is, although the SRET may be assessing negative cognitions, their differential availability may reflect existing associations with mood in memory, and need not be attributed to the effects of a modular cognitive structure.

A related challenge to its validity arises when one considers the argument that the SRET's ability to discriminate between depressed and anxious subjects (in terms of enhanced processing of either depression or anxiety related trait adjectives), confirms the existence of anxiogenic and depressogenic self-schemata (Greenberg, Vazquez, & Alloy, 1988; Ingram, Kendall, Smith, Donnell, & Ronan, 1987). Although the content-specificity hypothesis appears to be widely accepted by many cognitive-behavioural theorists (e.g., Alloy et al., 1988; Kendall & Ingram, 1989), and although Beck originally described schematic content differences between the depressed and anxious (Beck, 1976), it has been noted that he has revised his position to conclude that both conditions share a common cognitive diathesis (Beck, 1991). Either his revision is incorrect, or the SRET is measuring something other than dysfunctional schemata.

Kuiper has drawn attention to the distinction between vulnerability and episodic cognitions: The former play a

role in the onset and maintenance of disorder, and the latter are state-dependent (Kuiper et al., 1988). Beck claims that depression and anxiety share identical vulnerability cognitions, but that there are measurable differences in state-dependent cognition (Beck, 1987; 1991). Because the SRET examines participants' current self-descriptions, it is likely that it is measuring state-dependent cognitions, or what Markus has referred to as the "working" or "on-line" self-concept (Markus & Wurf, 1987). If this assumption is correct, it would appear that the SRET's differentiation between depressed and anxious subjects should not be attributed to the operation of anxiogenic or depressogenic schemata. It should, rather, be attributed to the influence of the sense of selves that are mediated by the separate instantiated schemata that are derived from the same dysfunctional semantic schema, or to the specific representations of self that tend to emerge after the onset of an episode of disturbance (e.g., Teasdale, 1988).

Implications for Schema Measurement

The preceding review of the problems with existing measures highlights the conceptual and methodological considerations that should be addressed when attempting to develop a measure of dysfunctional schemata.

First, it is essential to demonstrate that the measure is, in fact, measuring the intended construct (i.e., that it

is valid). At minimum this should involve demonstrating that it produces results that can be attributed to the cognitive processes that are assumed to represent schematic function. One might, for example, examine for evidence of stereotypical distortion of incoming information (Sanford & Garrod, 1981), or for evidence of modular relations among constituent elements (Segal, Hood, Shaw, & Higgins, 1988).

Second, allowance has to be made for the possibility that respondents are unable to report on the content of relevant schemata and/or their dysfunctional attitudes, even when the constructs are active. The most viable solution would be to draw inferences about content from analyses of schematic processing.

Finally, an instrument should have sufficient resolution to allow it to identify individual differences in the nature of schematic content, and should be able to identify something more than just "negative" content. To have meaningful research and clinical applications it should give an indication of the core schematic theme or attitude (Safran et al., 1986).

The collective flavour of these points is captured in Alloy et al.'s (1988) description of the essential criteria for a measure of depressogenic schemata:

> an <u>adequate</u> assessment of depressogenic self-schemata requires an examination of the specific information-processing effects associated with the

> negative self-perceptions contained in the schemata as well as a measurement of the content of the negative beliefs themselves. (p. 47, italics in original)

Multidimensional Scaling

Carroll and Arabie define MDS as "a family of geometric models for multidimensional representation of data and a corresponding set of methods for fitting such models to actual data" (1980, p. 608).

MDS models analyze matrices that indicate the degree of proximity between all pairs of objects in a stimulus set. The data are usually generated from ratings of similarity among object pairs. Ratings can be obtained for all pairwise comparisons, or from a free sort of objects into groups. In the latter case, proximity is indexed as the frequency of co-occurrence of pairs within groups (Kruskal & Wish, 1978).

MDS algorithms are grounded in an analogy between perceived similarity and geometric distance, and produce output consisting of spatial representations of the degree of proximity among the objects. The objects are represented by points which are defined by their coordinates on a number of axes or dimensions. More similar objects are represented by more closely aligned points.

Data sets can be examined for varying dimensionalities. Choice of the "best" solution is governed by considering

both the interpretability of the solutions and their goodness-of-fit to the original proximities (Davison, Richards, & Rounds, 1986; Kruskal & Wish, 1978). Among the various fit indices, the most commonly used is RSQ (r square), which is defined as the squared correlation between the proximities and the distances in the solution.

The primary goal of a scaling analysis is to interpret the selected solution because it is thought capable of giving insight into the "hidden structure" of the data set (Kruskal & Wish, 1978). As Fitzgerald and Hubert (1987) put it, "in a heuristic sense, . . . the dimensions serve to explain the arrangement of the objects in the given space" (p. 470). A dimension is interpreted by defining the properties or attributes that best differentiate the objects that group on each of its poles, or by identifying the properties that best describe the nature of the ordering of objects along the dimension. As with factor analysis, interpretation is usually theoretically driven.

Correlational techniques can also be used to verify a subjective or theoretical interpretation. It is common practice to use multiple regression, with the dimensions serving as the independent variables, and the mean ratings of attributes that are thought to differentiate the objects as the dependent variables. Attributes with significant multiple correlations and a high regression weight on a particular dimension provide satisfactory interpretations of

the dimension (Kruskal & Wish, 1978).

Weighted MDS procedures (WMDS; also known as three-way or individual difference models) are particularly interesting because they can analyze more than one proximity matrix. If each matrix corresponds to the judgements of an individual and a common group perceptual space can be assumed, they can then be used to identify the extent to which the dimensions have to be stretched or shrunk to accommodate the individual matrices. This makes it possible to identify the relative weighting or salience of each dimension for each participant (Davison et al., 1986). As such, WMDS appears suited to giving insight into the intuitive or tacit processes that are involved in an individual's perceptual world (Buser, 1989; Young & Harris, 1990).

MDS is interesting for a number of other reasons. Statistical power, for example, is determined more by the size of the stimulus set than by the sample size, and MDS is capable, therefore, of producing statistically stable dimensions with relatively small samples (Davison, 1983). Moreover, one need not use a particularly large stimulus set. Guidelines in the literature suggest that a 4 : 1 stimulus-dimension ratio will ensure stable output (Davison, 1983; Kruskal & Wish, 1978; Schiffman, Reynolds, & Young, 1981). MDS procedures are also low in experimenter contamination, in that instructions rarely specify which

attributes respondents should use in the similarity judgements. This allows dimensions of personal relevance to emerge in the solution (Schiffman et al., 1981). Finally, the solutions obtained in a weighted analysis cannot be rotated, and, unlike a standard analysis, produce dimensions that can be interpreted directly (Young & Harris, 1990).

MDS as a Measure of Schemata

Robins has argued that identifying the most salient dimensions that are used in making similarity judgements about objects is analogous to "examining the implicit categorization function" (1987, p. 199) of the semantic schemata used to perceive them. A number of studies have used WMDS procedures to examine the nature of the semantic schemata that were used by subjects who were experiencing sub-clinical emotional problems.

Landau (1980) produced a two dimensional solution from a weighted analysis of the semantic schemata that were used to perceive dogs. His sample consisted of eleven dog phobic and thirteen nonphobic undergraduates. He obtained an RSQ of .44. The dimensions were defined as "ferocity" and "size", and the interpretation was verified by correlating ratings of ferocity with each dimension. The subjects differed in the weighting given to each dimension, in that the phobics made extensive use of ferocity over size, whereas the nonphobics tended to emphasize size. Landau argued that the phobics' overemphasis of information

pertaining to the dogs' perceived ferocity tended to illuminate the adaptiveness of their relatively pervasive engagement in avoidance behaviour.

Goldfried et al. (1984) used a WMDS procedure to examine the semantic schemata used by thirty male undergraduates in perceptions of heterosexual situations. Three dimensions were produced in the solution: "intimacy"; "chance of being evaluated"; and "academic relevance". The RSQ was .66, and interpretation was facilitated by correlating the dimensions with the mean ratings obtained from eight bipolar scales that had been completed by clinical psychology graduate students.

Subjects were placed in either a socially anxious or non-anxious group, and were found to differ in the weightings given to each dimension. Anxious subjects weighted intimacy and chance of being evaluated equally heavily, with a relative underemphasis of academic relevance. Non-anxious subjects weighted intimacy most heavily, and chance of being evaluated least heavily. Thus the anxious subjects appeared to construe the situations using a strong self-focus, and with preoccupation over the possibility of negative evaluation. In contrast, the non-anxious revealed much less concern about negative evaluation, and greater awareness of the external cues in the situations. These findings were considered compatible with the general literature on social anxiety which tends to

emphasize the primary role of selective attention to perceived personal inadequacy.

Robins (1987) extended Goldfried's study by examining perceptions of both same and opposite-sex situations. Forty-five male undergraduates were classified according to degree of heterosocial self-efficacy, which was considered equivalent to social anxiety. Two dimensions were found to account for the semantic schemata that were used to perceive opposite-sex interactions ("risk of conflict" and "intimacy of the relationship"), and a separate two-dimensional solution was produced for same-sex situations ("intensity of feelings" and "risk of conflict"). The RSQs were .91 and .84, and the dimensions were interpreted after regressing the mean ratings from fourteen adjective scales onto the dimensions. Robins also conducted a test-retest reliability analysis of his procedure by assessing the stability of the similarity judgements that gave rise to the dimensions. He found and reported high stability ($r = .87$) over a one to two week period.

For opposite-sex situations low and medium self-efficacy subjects used the intimacy dimension more, and risk of conflict less, than did subjects of high self-efficacy. For same-sex situations all three groups placed similar emphasis on intensity of feeling, and those in the low and medium self-efficacy groups emphasized intimacy much more than the highly self-efficacious.

Robins argued that the critical differences between his and Goldfried's results (i.e., the different solutions for opposite-sex situations, and the relative change in emphasis of the intimacy dimension), could be attributed to differences in the situations that were employed in each study. Goldfried used the items from The Situation Questionnaire (Rehm & Marston, 1968), which included dating-related items and descriptions of relatively innocuous general social situations. Robins used items from the Interpersonal Interaction Survey (Bellack, Hersen, & Lamparski, 1979), which, in addition to containing more "difficult" dating-related items, includes items relating to assertive behaviour.

Robin's use of what were probably more threatening scenarios may therefore have made risk of conflict a more salient dimension than chance of being evaluated. He also suggested that the low and medium self-efficacy subjects may have placed greater emphasis on intimacy, because "it is typically in interacting with women one does <u>not</u> know well, whom one would like to know better, that perceptions of low self-efficacy and their concomitant emotional and behaviour consequences arise" (p. 210, italics in original).

<u>Conclusions</u>

It was argued in the conclusion to the review of existing measures that an adequate measure must produce results that can be attributed to the operation of schemata,

in addition to measuring individual differences in content.

Requests for similarity judgements appear equivalent to requests to categorize the objects. This process obviously involves comparison with internal representations, and, as such, offers insight into the nature of the categories represented within the respondent. Demonstration of stable group differences in the use of personally salient dimensions implies not only that "core" categories were being accessed, but that they were used to stereotypically impose meaning on the stimulus situations. This would imply that the categories had consistent internal structure, and this, in turn, is fully consistent with a schematic conceptualization of the representations.

The scaling procedures did not, of course, unequivocally address all of Williams et al.'s (1988) criteria. The most salient schematic themes were defined by inference, and it can only be assumed that the structures contained generic representations. Moreover, the procedures did not indicate whether the schemata had modular properties. Nevertheless, it is clear that they did not require self-report, that they revealed theoretically and clinically relevant information about the tacit cognitive processes that were involved in participants' perceptions of situations, and that these processes correspond to the operation of what are typically understood to be semantic schemata. These characteristics would suggest that MDS

merits investigation as a measure of dysfunctional schemata in clinical anxiety and depression.

The differences between Goldfried's and Robins' results highlight how important the selection of stimulus items is in an MDS analysis. A review of Beck's theory would suggest that in attempting to use MDS as a measure of dysfunctional schemata in anxiety and depression, one would do well to sample from events that clinically anxious and depressed individuals consider upsetting, because these should represent events that are processed by dysfunctional schemata.

Choice of the design for an investigation of the procedure's psychometric properties is also facilitated by a consideration of Beck's model. For example, because it cannot be assumed that dysfunctional schemata are active during recovery, it is clear that analysis of temporal reliability should be restricted to those participants who exhibit stability of mood over both occasions.

Moreover, given that Beck has argued that clients are aware of the products of the operation of their dysfunctional schemata, it would also seem important to attempt to verify theoretical interpretation of the dimensional output by regressing ratings of an appropriate sample of consciously accessible schematic products over the dimensions. An individual, for example, whose dominant dysfunctional semantic schema stereotypically defines

situations as instances of personal rejection should have a conscious sense of self as having been rejected, or as being undesirable. Participants could therefore be asked to complete a questionnaire containing items that describe typical schema products, and, in keeping with convention, schematic content would be inferred from the thematic content of any item that has both a significant multiple correlation with the dimensions, and a high weight on a dimension.

In terms of demonstrating validity, one would expect that either a two or three dimensional solution would be obtained from the scaling analysis of the similarity judgements, corresponding to the schematic themes of sociotropy and autonomy, or to acceptance, competence, and control. Interpretable findings would support the conclusion that the measure is adequately sampling the intended content domain. Furthermore, because it is assumed that dysfunctional semantic schemata operate only during episodes of disturbance, one would also expect that a different dimensional solution would be obtained from administration to a non-anxious or depressed group. If so, this would provide evidence of discriminant validity.

These attempts to address validity are based, of course, on analyses of group data. Determination of the degree of validity at the individual level of analysis would require comparisons of individual differences in the use of

dimensions/schemata with responses to an alternative measure of the construct. Although it has been argued that adequate measures of dysfunctional schemata are not currently available, it is reasonable to accept that dysfunctional schemata/attitudes can be identified in cognitive therapy.

The results of a participant's completion of the scaling procedure could therefore be compared with his or her schemata that are uncovered during therapy. The fact that dysfunctional schemata tend to be identified in therapy as dysfunctional attitudes is not problematic: the operationalization used in this research specifies that the schema and attitude are functionally, and therefore thematically, related. Evaluation of the measure's performance at the individual level of analysis would reduce, then, to a comparison of the extent of thematic match between the scaling procedure and therapist judgements. As such, this would offer an index of predictive or criterion-related validity.

CHAPTER 3

Design of the Multidimensional Scaling Procedure

This chapter consists of two sections. The first describes the development of the scaling procedure that was used as a measure of dysfunctional schemata. It contains a description of the selection of the stimuli that were presented for participants' similarity judgements, and a description of the administration procedure that was used to elicit the judgements.

The second section describes the design of the Attribute Questionnaire. This questionnaire was constructed to measure hypothesized schema products, with the intent of providing data for the regression analyses that were used to interpret the dimensions produced in the analyses of the participants' responses to the scaling procedure.

The Scaling Procedure

Stimulus Selection

The central concern in the selection of the stimulus set amounted to a concern over content validity: It was considered vital that the stimuli represent events that are typically processed by dysfunctional schemata.

It has been noted that the principal method of identifying schemata in therapy involves analysis of the themes that emerge in patients' reactions to upsetting events that are experienced during the course of therapy. In practice, patients are usually asked to complete the

Daily Record of Dysfunctional Thoughts (DRDT; Beck et al., 1979). Specifically, they are asked to record descriptions of the upsetting events that are experienced between sessions, to log their associated cognitive and affective reactions, and to include quantitative ratings of the extent of the affective reactions. The records are reviewed during sessions in an attempt to identify patterns in the response to situations, and the patterns are assumed to be related to the content of an underlying dysfunctional schema: consistent reactions to social disapproval, for example, are taken to indicate an excessive and dysfunctional need for approval. Situations with the highest affective ratings tend to receive most attention, because they are considered more likely to reveal core themes (Safran et al., 1986).

A decision was made to select stimuli from a sample of the most upsetting events that had been recorded in DRDTs by depressed and anxious individuals, because it is reasonable to assume that they represent the kinds of events that engage dysfunctional schemata. Arrangements were therefore made to obtain access to patient files that had been used by the Cognitive Therapy Sub-Group at the Holy Cross Hospital, Calgary, Alberta. The group functions as part of out-patient mental health services, and consists of a small number of therapists who work from a generalist cognitive-behavioural orientation. Therapists were asked to provide the investigator with copies of DRDTs that had been

completed by discharged patients, or from patients in the final stages of therapy. Requests were restricted to those patients who were eighteen years or older, and who had received diagnoses of anxiety or depression.

Thirty sets of DRDTs were requested and received. Seventeen had been completed by depressed patients. The event or situation that had been classified as the most emotionally arousing was copied from each set. Nine events were randomly selected from each set of the anxious and depressed patients' records, resulting in a final selection of eighteen items. This number was based on the guidelines of MDS authorities who argue that in order to generate up to four statistically stable dimensions (which offers the optimum limit of interpretability), it is necessary to collect similarity judgements on approximately sixteen items (Davison, 1983; Schiffman et al., 1981).

Because most of the original situations had been recorded in an abbreviated format, the selected items were re-written as formal sentences, and, in an attempt to convey a sense of immediate personal relevance when read by participants, were written in the second person and in the present tense. Two versions of two of the items (nine and eleven) were also produced to ensure comparable statements when read by males and females.

Copies of the items were then provided to a Ph.D. qualified clinical psychologist, and three doctoral students

in the Educational Psychology department at the University of Calgary. The group was asked to provide feedback on syntax and clarity. A small number of editorial adjustments were suggested and responded to. For example, item eighteen originally appeared to have an overly restrictive range of applicability. It originally read "Friends criticize you for yelling at your father on Thanksgiving" before being changed to "Friends criticize you for yelling at a member of your family on Thanksgiving". The final versions of the items are presented in Table 1.

The Administration Procedure

In view of the time that would be required to complete the one hundred and fifty-three similarity judgements for all pairwise comparisons of the eighteen stimuli, it was considered preferable to follow the commonly used alternative of allowing participants a free sort of the stimuli into piles, based on mutually exclusive perceptions of similarity (Schiffman et al., 1981).

The items were typed on five-by-three inch index cards to allow administration of the procedure. The instructions for administering the sort were intended to encourage participants to imagine experiencing the events, which, in turn, was intended to allow the relevant dysfunctional schemata to become activated. They were based on the typical directions that have been reported in the literature (e.g., Goldfried et al., 1984), and are presented in Table 2.

Table 1. The Scaling Procedure Stimuli.

1. You make a driving mistake on the highway, and cut someone off.
2. You are stopped by police for driving illegally through an intersection.
3. You become "tongue-tied" when introduced to a small group of strangers.
4. You forget to turn the lights off after parking the car, and the battery runs down.
5. It's Monday morning and you realize that you have an awful lot of work to do.
6. Your application for a new and better job is rejected.
7. You have to ask a colleague to help you with something that you ought to be able to do yourself.
8. You're at work and your boss comes up and tells you that you're behind schedule on a project.
9. Someone you supervise tells you he's unhappy with his evaluation, and that he wants to discuss it with you.
10. Your doctor is rude to you.
11. A friend reminds you of a favour you said you'd do for her, but that you haven't been able to find time for yet.
12. You're at a party, and a group of friends begin to tease you.
13. It's your birthday, and you don't receive any cards.
14. You have an unexpected and quite bitter argument with a good friend.
15. You make a joke that someone you like takes the wrong way.
16. Your partner appears to be acting cool towards you.
17. You hear rumours that there may be layoffs at work.
18. Friends criticize you for yelling at a member of your family on Thanksgiving.

Table 2. The Scaling Procedure Instructions

Please read through each of the cards in this deck, and try to visualize yourself in each situation. It doesn't matter if the circumstances aren't directly applicable: for example if you're not currently employed and the card says that you are. Just try to imagine being in the situation, as vividly as you can. Bearing in mind how you've imagined the situation, I'd like you to sort the cards into piles on the basis of similarity, so that the situations that seem most similar are placed in the same pile. You can use as many piles as you wish, and you can place as few or as many cards in each pile. Finally, I'd like you to review your decisions, and, if necessary, make any changes.

Essentially, participants were asked to imagine experiencing all situations, and, as necessary, to treat the events as hypothetical. They were then asked to sort the cards on the basis of similarity. No definition of similarity was provided, and there was no restriction placed on the number of piles that could be used. After their selections, the participants were asked to review their decisions, and to make any desired changes.

The Attribute Questionnaire (AQ)

This questionnaire was constructed in order to obtain data that would facilitate interpretation of the dimensions produced in the scaling analysis. Fourteen questions were written to represent the consciously accessible cognitive products that Beck and his colleagues have attributed to the

operation of dysfunctional schemata, with the intent of using their mean ratings on the scaling procedure's eighteen stimuli as dependent variables in regression analyses.

The questionnaire items are listed in Table 3, and were based on descriptions of the anxiety and depression state-dependent cognitions that are thought to be driven by the schematic themes of sociotropy, autonomy, acceptance, competence, and control (Beck, 1983; Beck & Emery, 1985). Close reading of the descriptions suggested that acceptance could be considered synonymous with sociotropy, and that control could be subsumed under autonomy.

Items one to five were derived from descriptions of the sociotropic/acceptance theme. Items one and two ("Would you be afraid that people might disapprove of you?", "Would you feel lovable?") were written to represent the fear of disapproval, and the sense of feeling unlovable, that are described as characteristic manifestations of the perception of having failed to have one's dominant need for approval fulfilled. Items three and four ("Would you consider the situation threatening?", "Do you think you'd be able to handle the situation?") were written to represent the general sense of helplessness or vulnerability that is thought to be associated with an excessive sense of dependency on others, and item five ("Would you be able to handle your emotions?") was derived from the observations of emotional lability in those classified as sociotropic.

Table 3. The Attribute Questionnaire Items.

1. Would you be afraid that people might disapprove of you?
2. Would you feel lovable?
3. Would you consider the situation threatening?
4. Do you think you'd be able to handle the situation?
5. Would you be able to handle your emotions?
6. Would it affect your sense of independence?
7. Would you feel helpless?
8. Would you blame yourself?
9. Would you feel worthless?
10. Would you feel angry?
11. Would you feel competent?
12. Would you feel inferior?
13. Would you feel anxious?
14. Would you feel sad?

Items six through ten were derived from descriptions of autonomy/control. Items six and seven ("Would it affect your sense of independence?", "Would you feel helpless?") represent the restricted sense of independence and the sense of powerlessness that are experienced when high need for independence is thwarted. Items eight and nine ("Would you blame yourself?", "Would you feel worthless?") were written to represent the self-castigation that is experienced when it is felt that one has failed, and item ten ("Would you feel angry?") was derived from the observations of irritability in those classified as autonomous.

Items eleven and twelve ("Would you feel competent?", "Would you feel inferior?") were written to represent the characteristic perceptions of incompetence and inferiority that are driven by the perception of having failed to appear competent. Items thirteen and fourteen were included to provide information on the general emotional reactions of anxiety and sadness to the stimulus items.

A number of additional comments should be made about the questionnaire. First, draft versions of the fourteen questions were provided to the group that had reviewed the scaling stimuli, and their suggestions for editorial changes were incorporated into the final versions.

Second, a five-point scale was used to constrain answers to the questions, and was anchored by the descriptors "not at all" and "very much so". Ten of the

items were written such that high agreement with the questions would be represented by endorsement of "very much so", and the wording on the remaining four (two, four, five, and eleven) was reversed, such that high agreement would be represented by endorsement of "not at all". The order of the fourteen questions were randomly assigned for each of the eighteen stimuli.

Finally, the instructions for completing the questionnaire asked participants to answer the questions as though the event had actually occurred, and to concentrate on how they would feel in each situation. As with the instructions for the scaling procedure, the intent was to simulate experience of the event, and to allow the relevant schemata, and schematic products, to become activated.

The questionnaire is available from the investigator.

CHAPTER 4

Research Design and Methods

This chapter describes the two studies that were used to generate the data for the analyses of the scaling procedure's psychometric properties.

The first study was designed to address the questions of whether the procedure would generate stable results in a test-retest reliability analysis, whether it would generate a theoretically interpretable dimensional solution from administrations to a clinically anxious and/or depressed sample, and whether it would generate a different dimensional solution from administration to a non-anxious and/or depressed sample. The second study was designed to address the question of whether the measure would predict the core schemata of those participants who received cognitive therapy.

Data for the first study were obtained by administering the scaling procedure and Attribute Questionnaire to participants who met the inclusion criteria for an anxious/depressed group or for a non-anxious/depressed group. Data for the second study were obtained by following those anxious/depressed participants who received cognitive therapy, and by comparing their results from the scaling procedure with the schemata that were identified and recorded in a questionnaire by their therapists.

First Study

Participants

The Anxious/Depressed Group. Participants in this group were eighteen years or older, and met diagnostic criteria for at least one of the Axis I anxious and unipolar depressed conditions that are described in the revised third edition of the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-III-R; American Psychiatric Association, 1987). In addition, participants did not meet DSM-III-R criteria for a bipolar or psychotic disorder. The DSM-III-R provides the diagnostic criteria of choice in contemporary research, and includes the following relevant categories: Major Depression; Dysthymia; Panic Disorder (with or without Agoraphobia); Social Phobia; Simple Phobia; Obsessive Compulsive Disorder; Post-traumatic Stress Disorder; and Generalized Anxiety Disorder.

The essential feature of Major Depression is prominent and persistent depressed mood and/or loss of interest and pleasure in usual activities for a period of at least two weeks. Four additional symptoms must also be experienced, such as significant weight loss or gain, insomnia, feelings of inappropriate guilt, and suicidal ideation.

Dysthymia is considered less severe but more chronic than Major Depression. It is diagnosed if depressed mood has been experienced most of the day more days than not for a period of at least two years. Additional diagnostic

criteria include symptoms such as poor appetite or overeating, excessive fatigue, low self-esteem, and feelings of hopelessness.

The essential feature of Panic Disorder is recurrent and unexpected panic attacks that produce symptoms such as palpitations, depersonalization, derealization, choking, and fear of dying. Panic disorder is classified as occurring with Agoraphobia if the individual has developed marked fear of situations from which escape might be difficult, or in which help might not be available in the event of an attack.

The essential feature of Social Phobia is persistent fear of situations that involve the possibility of exposure to public scrutiny, or in which one fears acting in a humiliating or embarrassing way. Social situations are avoided or endured with intense anxiety, the avoidant behaviour interferes with routine functioning, and the fear is recognized as excessive or unreasonable.

Simple Phobia is diagnosed if an individual develops persistent fear of a circumscribed stimulus (such as dogs and snakes), if the stimulus is avoided or endured with intense anxiety, if the fear or avoidant behaviour interferes with routine functioning, and if the fear is recognized as excessive or unreasonable.

The essential feature of Obsessive Compulsive Disorder is recurrent obsessions or compulsions that are experienced as distressing, and that are time-consuming or significantly

interfere with routine functioning. Obsessions are defined as persistent ideas, thoughts, impulses or images that are experienced as intrusive or senseless, that cannot be ignored or suppressed, and that are recognized as the product of one's mind. Compulsions are defined as repetitive, purposeful, and intentional behaviours that are performed in response to an obsession, and according to certain rules or in a stereotyped manner. The behaviour is designed to prevent discomfort or to forestall a dreaded event, tends to be performed with a sense of compulsion, and is recognized as excessive and unreasonable.

Post-traumatic Stress Disorder is diagnosed if an individual has experienced an unusual, significant traumatic event, if there is persistent psychological re-experience of the event, if the individual avoids stimuli that are associated with the event or engages in numbing of general responsiveness, and if there are symptoms of increased arousal, such as irritability or outbursts of anger.

Finally, Generalized Anxiety Disorder is diagnosed if there is persistent unrealistic or excessive anxiety or worry over two or more life circumstances for a period of at least six months, and if the individual experiences symptoms such as muscle tension, restlessness, autonomic arousal, irritability, and an exaggerated startle response.

Twenty-nine participants (from thirty-four initial contacts) were included in this group, and were recruited

from four sources: the out-patient and in-patient populations of Mental Health Services at the Holy Cross Hospital, Calgary, Alberta; the Alberta Mental Health Clinic in Grande Prairie, Alberta; and the student population at Grande Prairie Regional College.

The Non-Anxious/Depressed Group. Participants in this group were eighteen years or older, and did not meet DSM-III-R criteria for anxiety or depression. The twenty-two included in this group were recruited in response to posted advertisements from two sources: the graduate student population at the University of Calgary; and the general community at Grande Prairie Regional College.

Descriptive data on both groups are available in Table 4, and specific diagnoses for the anxious/depressed in Appendix A. Because the non-anxious/depressed were included to address the question of the scaling procedure's capacity to generate evidence of discriminant validity, they were not conceptualized as controls, and between-group statistical comparisons were not computed.

The average age of participants in the anxious/depressed group was thirty-six. Sixty-nine percent were female, fifty-two percent were married or cohabiting, thirty-four percent had never married, and fourteen percent were separated or divorced. Sixty-five percent were employed, twenty-one percent were enrolled as post-secondary students, and fourteen percent were not employed.

Table 4. Participant Characteristics.

Variables	A/D Group (n = 29)	Non-A/D Group (n = 22)
Age; Mean (SD)	35.8 (10.7)	27.1 (7.8)
Sex **a**		
Male	9 (31.0)	7 (31.8)
Female	20 (69.0)	15 (68.2)
Marital Status		
Married/cohabiting	15 (51.7)	4 (18.2)
Separated/divorced	4 (13.8)	4 (18.2)
Never married	10 (34.5)	14 (63.6)
Employment Status		
Employed/Student	25 (86.2)	22 (100)
Unemployed	4 (13.8)	0 (0)
Education		
High school or less	10 (34.5)	0 (0)
Part college or more	19 (65.5)	22 (100)
Diagnosis		
Anxiety	4 (13.8)	-----
Depression	9 (31.0)	-----
Anxiety/Depression	16 (55.2)	-----
Treatment		
Medication	-----	-----
Psychotherapy	14 (48.3)	-----
Combination	7 (24.1)	-----
Waitlist	7 (24.1)	-----
No. anxious episodes, mean (SD)	1.2 (0.9)	.05 (0.2)
No. depressed episodes, mean (SD)	4.9 (4.4)	.73 (1.2)
BDI; mean (SD)	16.4 (9.8)	2.7 (3.2)
SAI; mean (SD)	44.7 (13.0)	29.64 (7.7)

Note. A/D=Anxious/Depressed; Non-A/D=Non-Anxious/Depressed; BDI=Beck Depression Inventory; SAI=State Anxiety Inventory; **a**=percentages in parentheses

Sixty-six percent had received at least some post-secondary education. Fourteen percent were classified as clinically anxious on the basis of diagnoses of Agoraphobia or Social Phobia, and thirty-one percent were classified as clinically depressed on the basis of diagnoses of Major Depression or Dysthymia. Fifty-five percent were classified as mixed anxious-depressed on the basis of diagnoses for both anxiety and depression, or on the basis of full and sub-clinical diagnoses across both conditions. Full or sub-clinical diagnoses were made for Agoraphobia, Social Phobia, Panic Disorder with and without Agoraphobia, Simple Phobia, Obsessive Compulsive Disorder, Generalized Anxiety Disorder, Major Depression, and Dysthymia. Forty-eight percent of the group were receiving psychotherapy, twenty-four percent a combination of psychotherapy and psychotropic medication, and twenty-one percent were on a waitlist for therapy. Seventeen percent were in-patients. Participants had experienced, on average, approximately one anxious episode and five depressive episodes, and produced mean scores of sixteen and forty-five on the Beck Depression and State Anxiety Inventories.

The average age of participants in the non-anxious/ depressed group was twenty-seven. Sixty-eight percent were female, sixty-four percent had not married, eighteen percent were married or cohabiting, and eighteen percent were separated or divorced. All twenty-two were engaged in post-

secondary education. The participants had experienced, on average, less than one anxious and depressed episode, and produced mean scores of three and thirty on the Beck Depression and State Anxiety Inventories.

Measures

Five instruments were used in the project; the scaling procedure, the Attribute Questionnaire, a diagnostic interview schedule, and two self-report mood inventories.

The Structured Clinical Interview for DSM-III-R (SCID). The SCID (Spitzer, Williams, Gibbon, & First, 1990) was used to identify participants who met the diagnostic criteria for both groups. It provides standardized questions and procedures for determining DSM-III-R classifications, and consists of two sections: introductory questions covering demographic and provisional diagnostic data; and specific questions that allow for more careful consideration of specific diagnostic criteria. The second section provides detailed probes for all of the relevant DSM-III-R depressed and anxious conditions with the exception of Post-traumatic Stress Disorder.

The reliability of diagnostic interview schedules is usually determined by quantifying the agreement between two or more interviewers across a group of participants. The diagnostic reliability coefficients that have been obtained for the SCID tend to fall within the range of .70 to .90 that is typical for most diagnostic interviews (Clark, 1989;

Riskind, Beck, Berchick, Brown, & Steer, 1987; Spitzer et al., 1990). Spitzer et al. note that it is not, as yet, possible to comment on the SCID's validity, because a "hypothetical 'gold standard' . . . for psychiatric diagnosis remains elusive" (p. 16). However, given that DSM-III-R criteria are used extensively in research and in professional practice, and given that the SCID was designed to assess these criteria, it would seem reasonable to accept that it possesses a degree of content or face validity.

Two versions of the SCID were used in the project: the SCID-P (Patient Edition with Psychotic Screen) was used with prospective participants for the anxious/depressed group; and the SCID-NP (Non-patient Edition) was used with non-anxious/depressed participants. The editions differ only in the nature of their introductory questions in that the SCID-NP does not assume experience of current difficulties.

The Beck Depression Inventory (BDI). The BDI (Beck & Steer, 1987; Beck, Ward, Mendelsohn, Mock, & Erlbaugh, 1961) was used to monitor mood levels in those participants who provided data for the reliability analysis. It is the most popular and widely used self-report measure of depressive symptomatology. It consists of twenty-one groups of statements, and respondents are asked to choose the item from each group of four that best describes their experiences in the preceding seven days. The selected items are scored from zero to three, and total scores range from

zero to sixty-three. The authors of the test recommend that a score of less than ten be considered indicative of a non-depressive state.

There have been numerous investigations of the BDI's psychometric properties. High reliability coefficients have typically been reported (an average of .86 for split-half coefficients). Moreover, it has generated evidence of convergent and concurrent validity in that it correlates quite highly with other self-report measures (an average of .69) and with clinician ratings (an average of .72) of depression (Beck & Steer, 1987; Gotlib & Cane, 1989).

The State Anxiety Inventory (SAI). The SAI (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) was also used to monitor mood levels in the reliability analysis. It is one of the two measures that constitute the State-Trait Anxiety Inventory. Respondents use a four-point scale to rate the extent to which each of twenty-one items describe their experience of anxiety symptoms during the course of the current day. Each item is scored from one to four, and total scores range from twenty-one to eighty-four.

Gotlib and Cane (1989) rate this inventory as one of the two best self-report measures of generalized anxiety: it is associated with high reliability coefficients (internal consistency coefficients range from .86 to .95), and it can be considered valid to the extent that scores typically change as a function of the introduction of

anxiety reduction or enhancement strategies.

Procedure

In consideration of the ethical principle governing use of coercive recruitment practices, prospective participants for the anxious/depressed group were initially approached by their therapists, or, if on a wait-list, by the clinic director, in order to determine interest in participating in the project. The therapists had been informed of the general purpose of the project, and had been asked to approach patients who were anxious and/or depressed.

Those participants who agreed to participate were then interviewed either before the beginning of therapy (i.e., while on a wait-list), or during the early stages of treatment. Exceptions to this process occurred when it was discovered that three of the individuals who had responded to one of the advertisements that was intended to recruit non-anxious/depressed participants met inclusion criteria for the anxious/depressed group.

Participants in both groups signed a statement of informed consent (see copy in Appendix B) before the administration of the Structured Clinical Interview, and before being asked to complete the Beck Depression Inventory, the State Anxiety Inventory, the scaling procedure, and the Attribute Questionnaire. The instruments were administered in the same order to each participant. Five participants from the anxious/depressed group did not

complete the Attribute Questionnaire because of fatigue, or because of time constraints. Each participant contact took approximately two hours. The scaling procedure took, on average, five minutes to administer.

Seven of the contacts were conducted by an assistant who has an honours undergraduate degree in psychology, and experience as a psychology research assistant. She received training in the administration of all instruments, with particular attention placed on SCID administrations. Training included observations of live administrations, and participation in role-plays. Audiotapes of all SCID administrations were reviewed by the investigator. This resulted in full agreement that all seven participants met their assigned diagnoses.

Twenty-three participants returned for a second meeting, at which time the Beck Depression Inventory the State Anxiety Inventory and the scaling procedure were again administered. The data obtained at this time were used in the reliability analysis. The meetings occurred approximately two weeks after the first (mean, 12.2 days; range, 6 - 28 days) and took approximately twenty minutes to conduct.

Fourteen participants from the anxious/depressed group were included in the twenty-three. Review of their mood inventory scores revealed that three who were initially diagnosed as depressed obtained BDI scores that were close

to zero, which is well within the non-depressed mood range (Beck & Steer, 1987). Because it cannot be assumed that dysfunctional schemata remain operative after remission of symptoms (Beck, 1991), and because it was possible that the three had experienced remission during the interim period, their data were excluded from the reliability analysis.

Using the data from the nine non-anxious/depressed who appeared for the second contact was not considered problematic. Although it had been predicted that the dimensional solutions for the two participant groups would be different, the scaling procedure's reliability was examined by determining the stability of the similarity judgements that gave rise to the solutions. Assuming stability of mood for participants in both groups, one would predict that regardless of the ultimate solutions, judgements of pairwise similarity should be stable for all participants. Thus it was considered legitimate to combine the data for the analysis.

Second Study

In order to collect data for the second stage of the investigation, therapists in the cognitive therapy group at the Holy Cross Hospital were asked to complete a questionnaire on any of their patients who had participated in the first study. The questionnaire is available in Appendix C, and involved a request of the therapists to identify the schemata or dysfunctional attitudes that

emerged for each patient over the course of therapy, and to rank-order them in terms of clinical significance. Completed questionnaires were returned for thirteen participants by three therapists; a psychologist, social worker, and registered psychiatric nurse.

In order to determine whether the scaling procedure's concordance with therapist-identified schemata exceeded that which could have occurred by chance, three Ph.D. qualified psychologists were asked to match the therapist-identified material with definitions of the schemata that were identified in the scaling analysis. None of the three had been involved in the project. Two had received training in clinical psychology, were employed in private practice, and defined their orientation as cognitive-behavioural. The third had received training in experimental psychology, and taught at a community college. Each was provided with a questionnaire (see Appendix D) that contained verbatim copies of the data that had been provided by the cognitive therapists, and theoretically based definitions of the dimensions that had been identified in the analysis of the anxious/depresseds' similarity judgements. The investigator met with each psychologist and discussed the instructions that were contained in the questionnaire. Essentially, they were asked to familiarize themselves with the schema definitions, and to match each of the items that had been identified by the therapists, with one of the definitions.

CHAPTER 5

Results

This chapter describes the results of the analyses of the scaling procedure's psychometric properties. It consists of five sections: the results of the reliability analysis; the results of the scaling analysis of the anxious/depressed group's similarity judgements; the results of the scaling analysis of the non-anxious/depressed group's judgements; the results of the statistical comparison of each group's dimensional solutions; and the results of the analysis of the extent to which the procedure predicted participants' core, therapist-identified, schemata.

Analysis of Test-Retest Reliability

The index of reliability that is appropriate in a test-retest analysis, the coefficient of stability (Crocker & Algina, 1986), was calculated by correlating the frequencies with which each of the one hundred and fifty-three pairwise combinations of the procedure's eighteen stimuli were co-sorted on both occasions by those participants who completed both administrations of the procedure.

It was noted in the last chapter that because this process involved analysis of the stability of similarity judgements as opposed to analysis of the MDS configuration, it was considered legitimate to use data from participants in the anxious/depressed and non-anxious/depressed groups. Basing the analysis on all twenty eligible participants, an

r of .74 ($p < .001$) was obtained.

It was also noted in the last chapter that temporal stability in the use of schemata is based on the assumption of corresponding stability in mood. The stability of the twenty participants' self-reported levels of depressed and anxious mood was examined by correlating the scores from their two completions of the Beck Depression Inventory and State Anxiety Inventory. The correlations were .90 ($p < .001$) for the BDI, and .65 ($p = .002$) for the SAI.

Scaling Analysis of the Anxious/Depressed Group Data

This section describes the process that was used to generate the scaling solution for the anxious/depressed group's similarity judgements, and the interpretations given to the dimensions contained within the solution.

The MDS Analysis

The participants' similarity judgements of the scaling procedure's eighteen stimuli were coded in square matrices by recording, as dissimilarities, all possible pairs that arose from the co-occurrence of the stimuli that were sorted within piles. Each matrix consisted of eighteen rows and columns, and each cell corresponded to one of the pairs of the eighteen stimulus events.

The lower diagonals of each of the twenty-nine dissimilarity matrices were analyzed with the nonmetric weighted individual differences multidimensional scaling model. The model involves monotonic transformation of the

dissimilarity data, and was run for two, three, and four dimensional solutions. Although either a two or three dimensional solution had been predicted, the higher dimensionality was included for exploratory purposes.

Davison (1983) recommends a ratio of three or four stimuli to each dimension in MDS analyses, and offers the following formula for sample size: $N = 40 R / (I - 1)$, where N is sample size, R is the expected number of dimensions, and I is the number of stimuli. The scaling procedure's eighteen stimuli were clearly adequate for up to a four dimensional solution, and the sample size of twenty-nine comfortably exceeds the minimum of ten that is required for that level of dimensionality.

Two indices were examined in order to determine the fits of the solutions to the dissimilarity data. The first, s-stress, is defined as the square root of the proportion of the sum of squares of the transformed data that is error. Error is defined as the lack of fit of the squared distances computed in the MDS analysis to the transformed data. The second, RSQ (r square), is the squared correlation between the distances and the transformed data. RSQ can also be understood as the proportion of variance in the transformed data that is accounted for by the scaled distances. Both indices range from zero to one, and good fit is associated with low s-stress, and high RSQ (Young & Harris, 1990).

All three generated configurations were associated with very high fits to the dissimilarity data. The respective s-stress and RSQ values were .21 and .83 for two dimensions, .16 and .87 for three, and .14 and .88 for four. Because of the minimal gains in fit for the higher dimensionalities, the choice of dimensionality was determined by considering the interpretability of each solution. The three dimensional solution was considered to be the most interpretable and was chosen for subsequent analysis.

The stimulus coordinates for the three dimensions are presented in Table 5, and are represented spatially in Figures 1 through 3. Figure 1 represents the stimuli plotted against dimensions one (horizontal axis) and two (vertical axis), Figure 2 represents the plots for dimensions one (horizontal) and three (vertical), and Figure 3 the plots for dimensions two (horizontal) and three (vertical).

Calculation of inter-dimension correlations revealed that the dimensions were almost perfectly orthogonal: -.01 for dimensions one with two; -.02 for one with three; and -.04 for two with three. Collectively, dimensions one and two should be thought of as lying in the same plane, with dimension one going left to right, and dimension two going down to up. Dimension three should be thought of as lying in an orthogonal plane, thereby going near to far.

Table 5. Stimulus Coordinates for the Three Dimensional Solution Generated for the Anxious/Depressed Group.

Event *	Dim 1	Dim 2	Dim 3
Event 1	-0.4438	1.7223	0.5077
Event 2	-0.3351	0.9485	1.6380
Event 3	-1.2007	-0.7565	1.6599
Event 4	0.2061	-0.0765	1.6956
Event 5	2.2099	0.2526	0.3152
Event 6	0.3540	-1.3623	-0.2420
Event 7	0.7084	0.4552	0.3525
Event 8	1.4283	-0.1434	-0.3125
Event 9	0.8297	0.5224	-0.8868
Event 10	-0.6743	0.5525	0.1824
Event 11	0.6124	0.9220	-1.5823
Event 12	-0.8763	-0.2459	0.1609
Event 13	-0.9084	-2.3251	-0.3086
Event 14	-0.6579	0.1728	-1.7288
Event 15	-1.0743	1.5466	-0.7017
Event 16	-0.3474	-0.7212	-1.3089
Event 17	1.4733	-1.2321	0.6359
Event 18	-1.2859	-0.2320	-0.0767

* Descriptions of the events are provided on page 75.

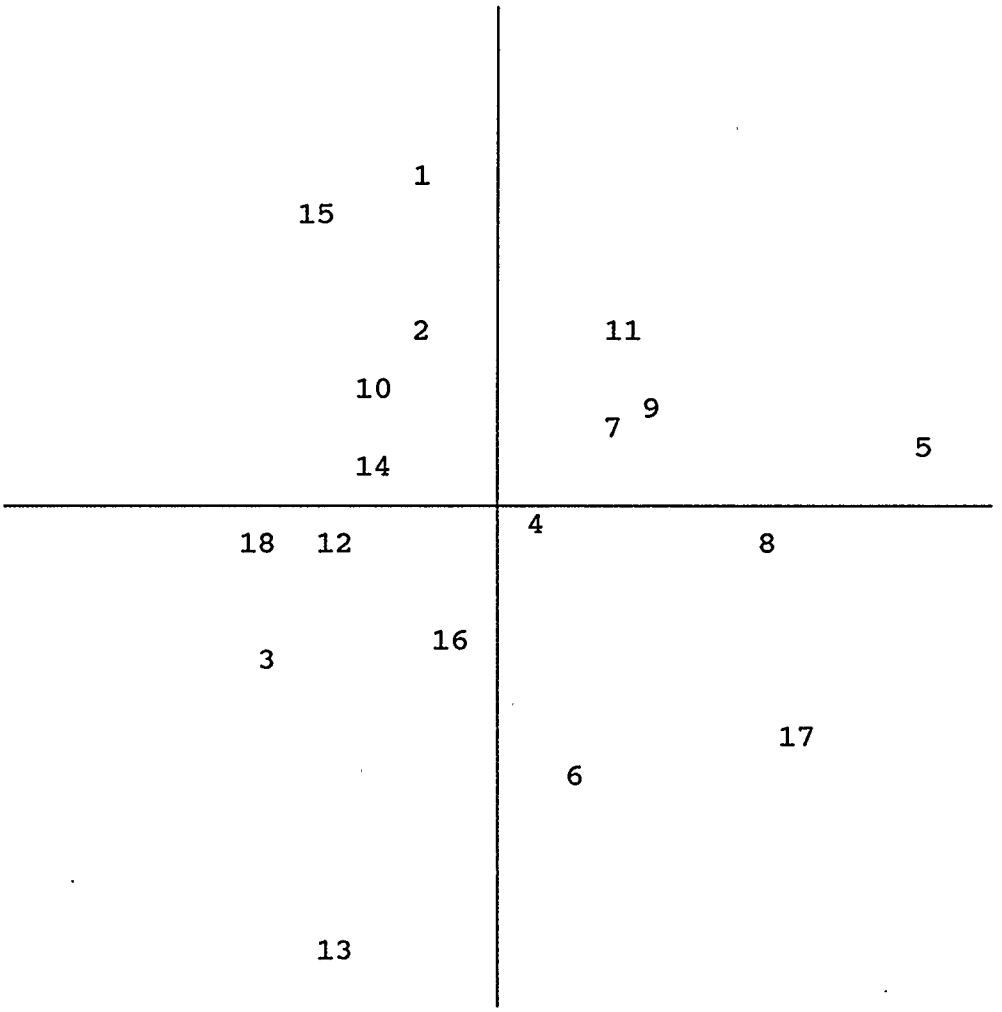

Figure 1. Stimulus Space for Anxious/Depressed Group: Dimension 1 (x axis) versus Dimension 2 (y axis).

Note. Event Descriptions on Page 75.

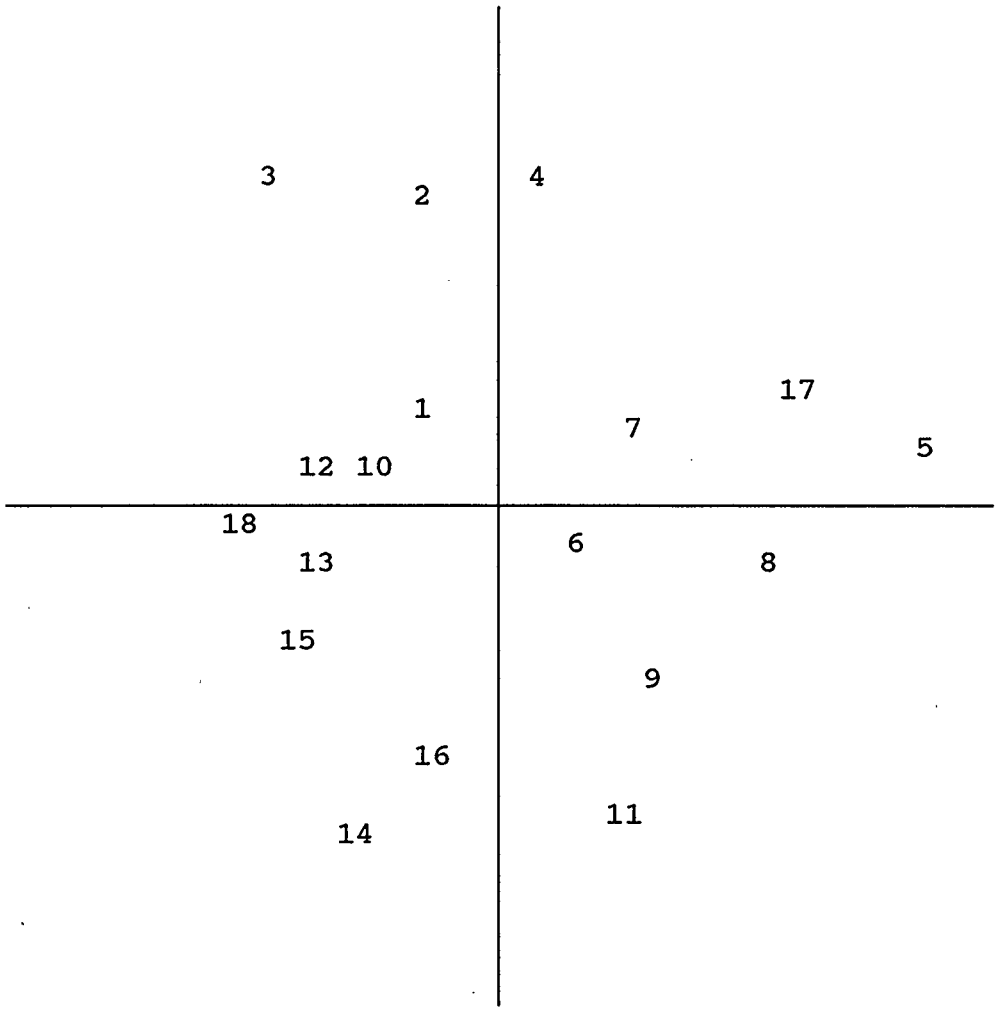

Figure 2. Stimulus Space for Anxious/Depressed Group: Dimension 1 (x axis) versus Dimension 3 (y axis).

Note. Event Descriptions on Page 75.

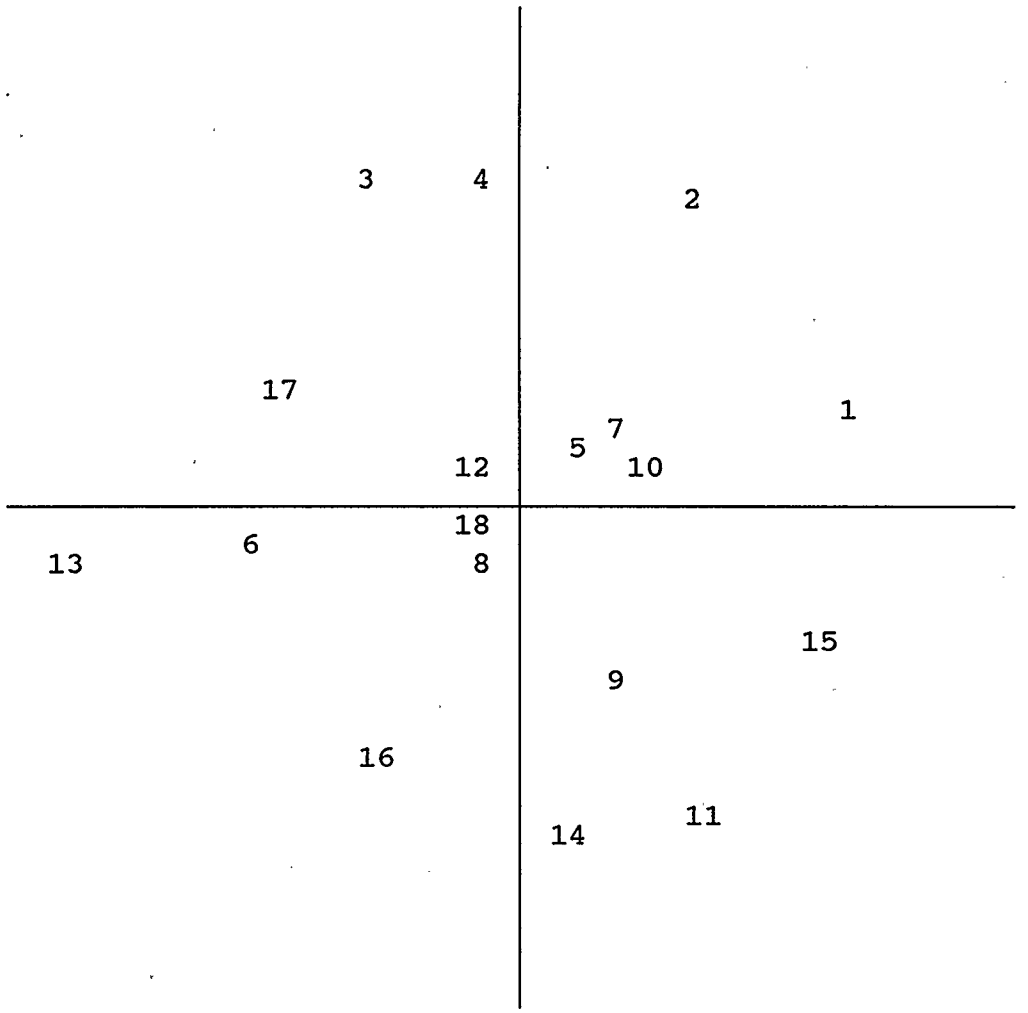

Figure 3. Stimulus Space for Anxious/Depressed Group: Dimension 2 (x axis) versus Dimension 3 (y axis).

Note. Event Descriptions on Page 75.

Table 6. Event Descriptions for Figures 1, 2, and 3.

1. You make a driving mistake on the highway, and cut someone off.
2. You are stopped by police for driving illegally through an intersection.
3. You become "tongue-tied" when introduced to a small group of strangers.
4. You forget to turn the lights off after parking the car, and the battery runs down.
5. It's Monday morning and you realize that you have an awful lot of work to do.
6. Your application for a new and better job is rejected.
7. You have to ask a colleague to help you with something that you ought to be able to do yourself.
8. You're at work and your boss comes up and tells you that you're behind schedule on a project.
9. Someone you supervise tells you he's unhappy with his evaluation, and that he wants to discuss it with you.
10. Your doctor is rude to you.
11. A friend reminds you of a favour you said you'd do for her, but that you haven't been able to find time for yet.
12. You're at a party, and a group of friends begin to tease you.
13. It's your birthday, and you don't receive any cards.
14. You have an unexpected and quite bitter argument with a good friend.
15. You make a joke that someone you like takes the wrong way.
16. Your partner appears to be acting cool towards you.
17. You hear rumours that there may be layoffs at work.
18. Friends criticize you for yelling at a member of your family on Thanksgiving.

Table 7. Subject Weights and Matrix RSQs for Participants in the Anxious/Depressed Group.

	Subject weights			
Participant	Dim 1	Dim 2	Dim 3	RSQ
1	.1245	.6401	.7190	.942
2	.1783	.4023	.7783	.799
3	.7684	.3240	.5102	.956
4	.9554	.1042	.1441	.944
5	.2862	.6828	.3795	.692
6	.8125	.2966	.4554	.956
7	.1519	.8993	.1729	.862
8	.1535	.9367	.1305	.918
9	.2709	.4443	.7462	.828
10	.4362	.7651	.3763	.917
11	.2973	.6522	.4482	.715
12	.4009	.6593	.5731	.924
13	.1782	.2722	.8717	.866
14	.6962	.4513	.3139	.787
15	.2774	.6266	.6435	.884
16	.3426	.6079	.5123	.749
17	.8366	.2556	.3630	.897
18	.6321	.3900	.6052	.918
19	.3597	.7568	.2947	.789
20	.4055	.8054	.2631	.882
21	.8064	.1489	.2586	.736
22	.4643	.1329	.7783	.839
23	.1783	.8672	.3674	.917
24	.8206	.4440	.1622	.897
25	.6368	.1302	.6601	.858
26	.8012	.2496	.4434	.901
27	.9504	.0983	.0854	.920
28	.5467	.4145	.6729	.924
29	.9384	.0845	.2613	.949

Subject weights and matrix RSQs for each of the twenty-nine participants are presented in Table 7. Subject weights measure the salience or importance of each dimension to each participant. Overall, dimension one was considered most salient, and accounted for thirty-three percent of the variance. Dimension two was next most salient, accounting for twenty-nine percent of the variance, and dimension three accounted for twenty-five percent of the variance.

Matrix RSQs measure the degree of fit between each participant's transformed dissimilarity data and his or her scaled distance data. All twenty-nine dissimilarity matrices were well accounted for, with RSQs ranging from .69 for participant five, to .96 for participants three and six.

Interpreting the Solution.

Theoretical interpretation of the solution was based on attempts to identify the properties that appeared to differentiate the objects that grouped on opposite ends of each dimension (Kruskal & Wish, 1978). This process suggested relatively straightforward interpretations for the three dimensions.

Dimension One. It would appear that the first dimension is measuring perceptions of social inadequacy or incompetence. The positive pole is characterized by events that group around the theme of stress in the workplace: "It's Monday morning and you realize that you have an awful lot of work to do"; "You hear rumours that there may be

layoffs at work", "You're at work and your boss comes up and tells you that you're behind schedule on a project". There is no suggestion that the events should necessarily be attributed to the actions of the respondent.

In contrast, those on the negative pole appear to be characterized by events involving negative social evaluation that can, in the main, be attributed to social incompetence or ineptness: "Friends criticize you for yelling at a member of your family on Thanksgiving"; "You become 'tongue-tied' when introduced to a small group of strangers"; "You make a joke that someone you like takes the wrong way".

The apparent categorization on the basis of perceived social incompetence suggests that the dimension is measuring a semantic schema that is related to a dysfunctional attitude that is driven by a fear that one may be socially inferior or inadequate, and is compatible with Beck and Emery's description of Competence. As such, it was defined by the schematic theme of "Inferiority".

Dimension Two. The second dimension appears to be measuring perceptions of failure. The positive pole represents examples of relatively minor mistakes: "You make a driving mistake on the highway, and cut someone off"; "You make a joke that someone you like takes the wrong way"; "You are stopped by police for driving illegally through an intersection".

In contrast, those on the negative pole appear to represent more significant examples of failure, and the theme of thwarted aspiration: "It's your birthday and you don't receive any cards."; "Your application for a new and better job is rejected."; "You hear rumours that there may be layoffs at work.". It should be noted that the context provided by this dimension suggests that event thirteen ("It's your birthday, and you don't receive any cards") should be thought of as evidence of having failed to maintain others' approval, rather than evidence of having been rejected (Zuroff & Mongrain, 1987).

The apparent categorization on the basis of the degree of perceived failure in the social and achievement domains strongly suggests that the dimension represents a semantic schema that is related to the kind of dysfunctional attitude that causes the self-castigation and experience of blocked autonomous striving that Beck refers to in his descriptions of Autonomy. As such, it was defined by the schematic theme of "Autonomy".

Dimension Three. The third dimension appears to be measuring perceptions of interpersonal conflict. The positive pole is associated with examples of relatively minor and anonymous mistakes: "You forget to turn the lights off after parking the car, and the battery runs down"; "You become 'tongue-tied' when introduced to a small group of strangers"; "You are stopped by police for driving

illegally through an intersection". In contrast, the events on the negative pole are examples of interpersonal conflict, and are suggestive of concern over the possibility of incurring disapproval: "You have an unexpected and quite bitter argument with a good friend"; "A friend reminds you of a favour you said you'd do for her, but that you haven't been able to find time for yet"; "Your partner appears to be acting cool towards you".

It would appear that the dimension is measuring a semantic schema that is related to a dysfunctional attitude that is consistent with the significant commitment to the maintenance of harmonious relationships that Beck describes as the central component of Sociotropy. As such, it was defined by the schematic theme of "Dependency".

Verifying the Interpretation. Fourteen standardized multiple regression analyses were computed in order to evaluate the theoretical interpretation of the solution. Mean ratings of the scaling procedure's eighteen stimuli on the fourteen scales from the Attribute Questionnaire served as the dependent variables. The ratings were regressed against the coordinates on the three dimensions, which served as the independent variables.

The results of the analyses are presented in Table 8. Inspection of residual scatterplots revealed no significant failures in normality, linearity, and homoscedasticity for any analysis.

Table 8. Regression of Attribute Questionnaire Scale Mean Ratings onto the Three Dimensions: Anxious/ Depressed Group.

		Normalized weights				
	Attribute Scale	Dim 1	Dim 2	Dim 3	Mult. R	
1.	Fear disapproval?	-.441	.053	-.322	.546	
2.	Feel unlovable?	-.482	-.165	-.306	.587	
3.	Situation threatening?	-.005	-.199	-.282	.339	
4.	Not handle situation?	-.559	-.256	-.300	.674	**a**
5.	Not handle emotions?	-.549	-.267	-.468	.755	**c**
6.	Affect independence?	.019	-.564	-.063	.565	
7.	Feel helpless?	-.069	-.428	.067	.441	
8.	Blame self?	-.232	.378	.184	.478	
9.	Feel worthless?	-.417	-.508	-.287	.705	**b**
10.	Feel angry?	-.406	-.143	-.004	.430	
11.	Feel incompetent?	-.528	.055	.234	.584	
12.	Feel inferior?	-.577	-.346	.240	.705	**b**
13.	Feel anxious?	.140	.058	-.145	.212	
14.	Feel sad?	-.390	-.578	-.543	.864	**d**

a < .04 **b** < .02

c < .01 **d** < .001

Scales with significant multiple correlations are well accounted for by a linear combination of the three dimensions, and normalized regression weights indicate the relative contribution of each dimension. Because the dimensions are orthogonal, the regression weights can be interpreted in a straightforward manner (Tabachnick & Fidel, 1983). The results show that feelings of sadness were very well accounted for by the three dimensions ($p < .001$), primarily by dimensions two and three, that inability to handle emotions ($p < .01$), feelings of inferiority ($p < .02$), and inability to handle the situation ($p < .04$) were relatively well accounted for, primarily by dimension one, and that feelings of worthlessness were also relatively well accounted for ($p < .02$), primarily by dimension two.

The results support the theoretical interpretations of the first and second dimensions. The interpretation of the first dimension is obviously supported by the correlation with feelings of inferiority. Moreover, its correlations with inability to handle the situation and inability to handle emotions are consistent with the sense of incompetence or ineffectiveness that would be expected to co-occur with perceived inferiority.

The second dimension's correlation with feelings of worthlessness substantiates the theoretical interpretation of Autonomy in that worthlessness is considered by Beck to be the central product of thwarted autonomous striving.

Scaling Analysis of the Non-Anxious/Depressed Group Data

The MDS Analysis

The similarity judgements that were made by the twenty-two participants in the non-anxious/depressed group were coded in square dissimilarity matrices, and their lower diagonals were input to the nonmetric weighted individual differences scaling model that had been used with the anxious/depressed group. The data were analyzed for two, three, and four dimensional solutions. The sample size of twenty-two was more than sufficient for these selections (Davison, 1983).

Each of the solutions had exceptionally high fits to the dissimilarities. The respective s-stress and RSQ values were .15 and .89 for two dimensions, .11 and .92 for three dimensions, and .09 and .94 for four. In order to facilitate comparison with the solution that was chosen to account for the anxious/depressed group's similarity judgements, the three dimensional solution was chosen for subsequent analysis.

The stimulus coordinates for the three dimensions are presented in Table 9 and are represented spatially in Figures 4 through 6. Calculation of inter-dimension correlations revealed, again, that the dimensions were almost perfectly orthogonal: -.07 for dimension one with two; -.09 for one with three; and .10 for two with three.

Table 9. Stimulus Coordinates for the Three Dimensional Solution Generated for the Non-Anxious/Depressed Group.

Event *	Dim 1	Dim 2	Dim 3
Event 1	1.9228	0.1489	-0.2329
Event 2	1.7081	-1.1147	0.2533
Event 3	0.4095	-0.1920	0.1655
Event 4	1.6549	-0.9381	0.1772
Event 5	-0.2179	-1.3572	-2.0232
Event 6	-0.0407	-1.2975	1.3914
Event 7	0.3710	-0.1612	-1.0156
Event 8	-1.1549	-0.4922	-1.2781
Event 9	-1.4772	-0.6380	-0.0654
Event 10	0.0549	-0.2944	0.8973
Event 11	0.5549	0.8932	-1.7633
Event 12	-0.4181	0.9620	-0.1944
Event 13	-0.8441	0.3882	1.7190
Event 14	0.1024	1.7804	0.5068
Event 15	0.5128	1.5355	0.2073
Event 16	-0.9988	1.1604	1.2827
Event 17	-1.1659	-1.3557	0.3545
Event 18	-0.9736	0.9722	-0.3821

* Descriptions of the events are provided on page 88.

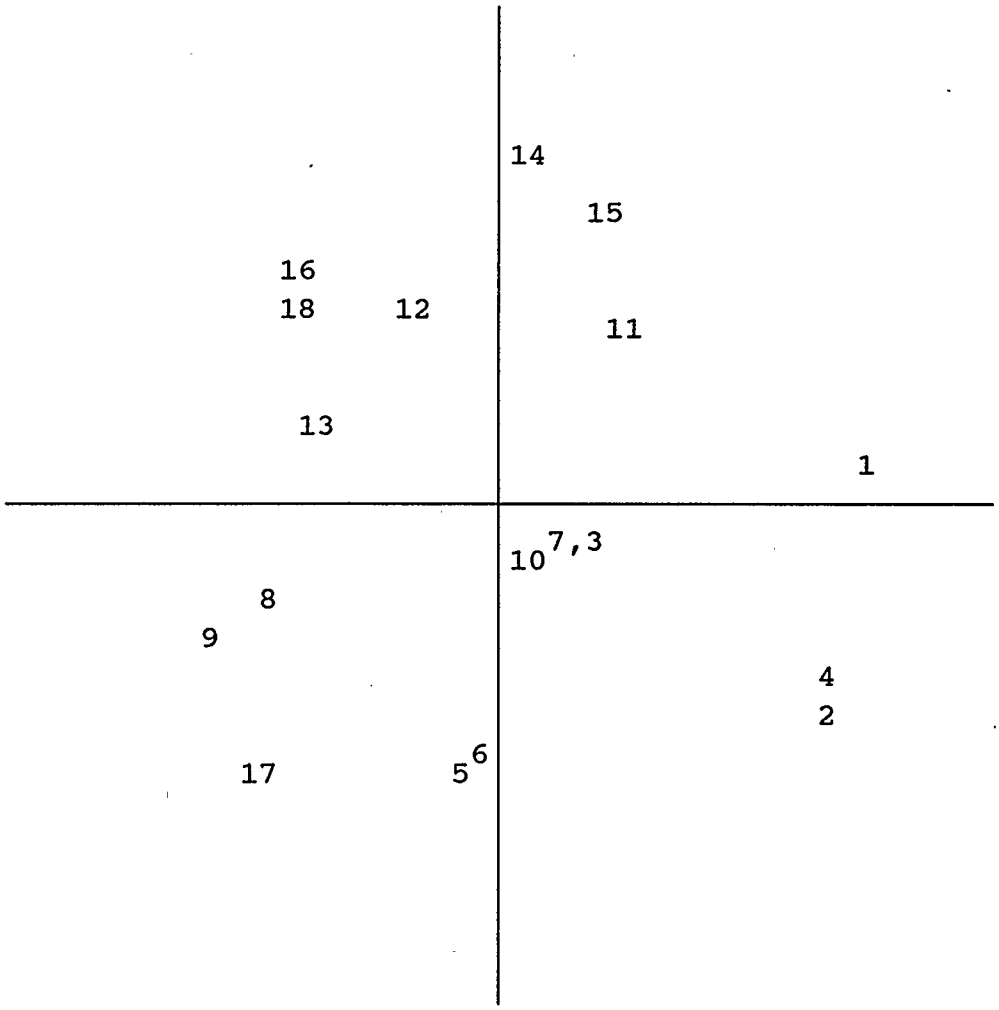

Figure 4. Stimulus Space For Non-Anxious/Depressed Group: Dimension 1 (x axis) versus Dimension 2 (y axis).

Note. Event descriptions on page 88.

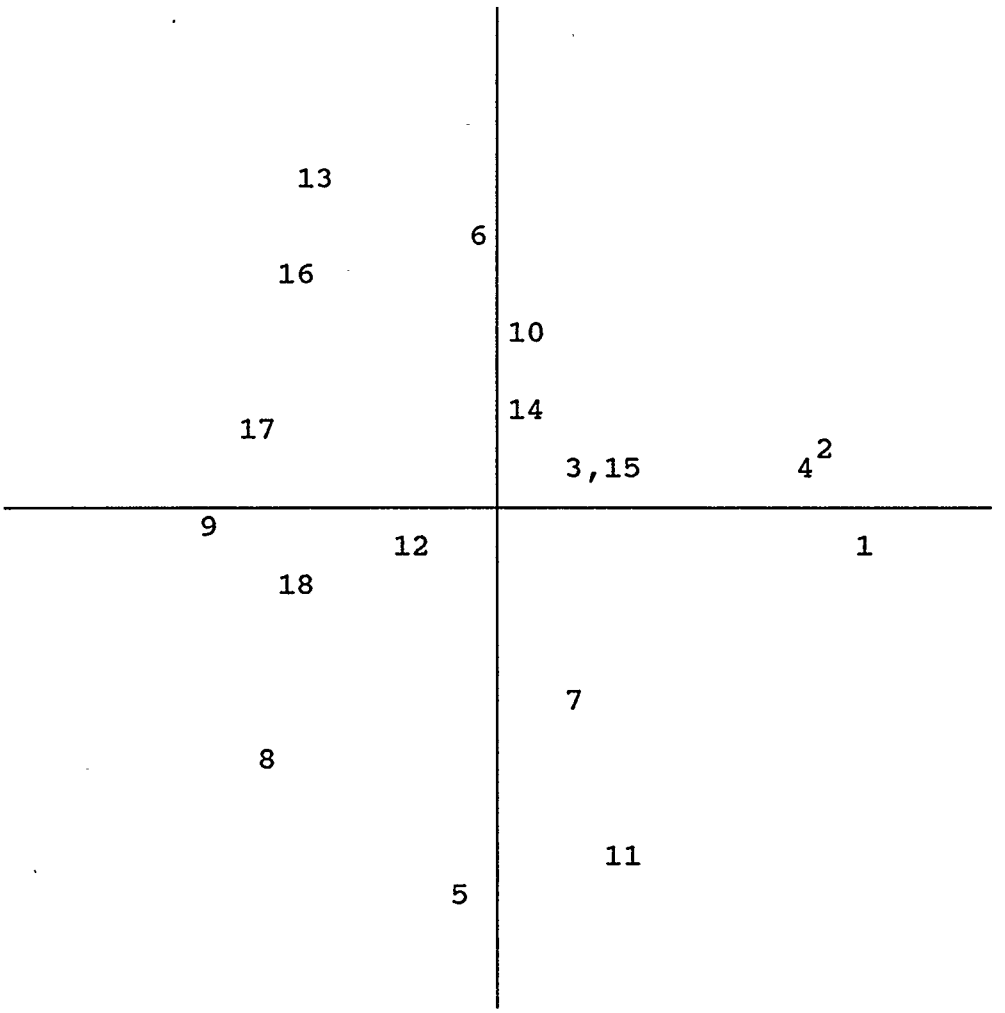

Figure 5. Stimulus Space for Non-Anxious/Depressed Group: Dimension 1 (x axis) versus Dimension 3 (y axis).

Note. Event Descriptions on Page 88.

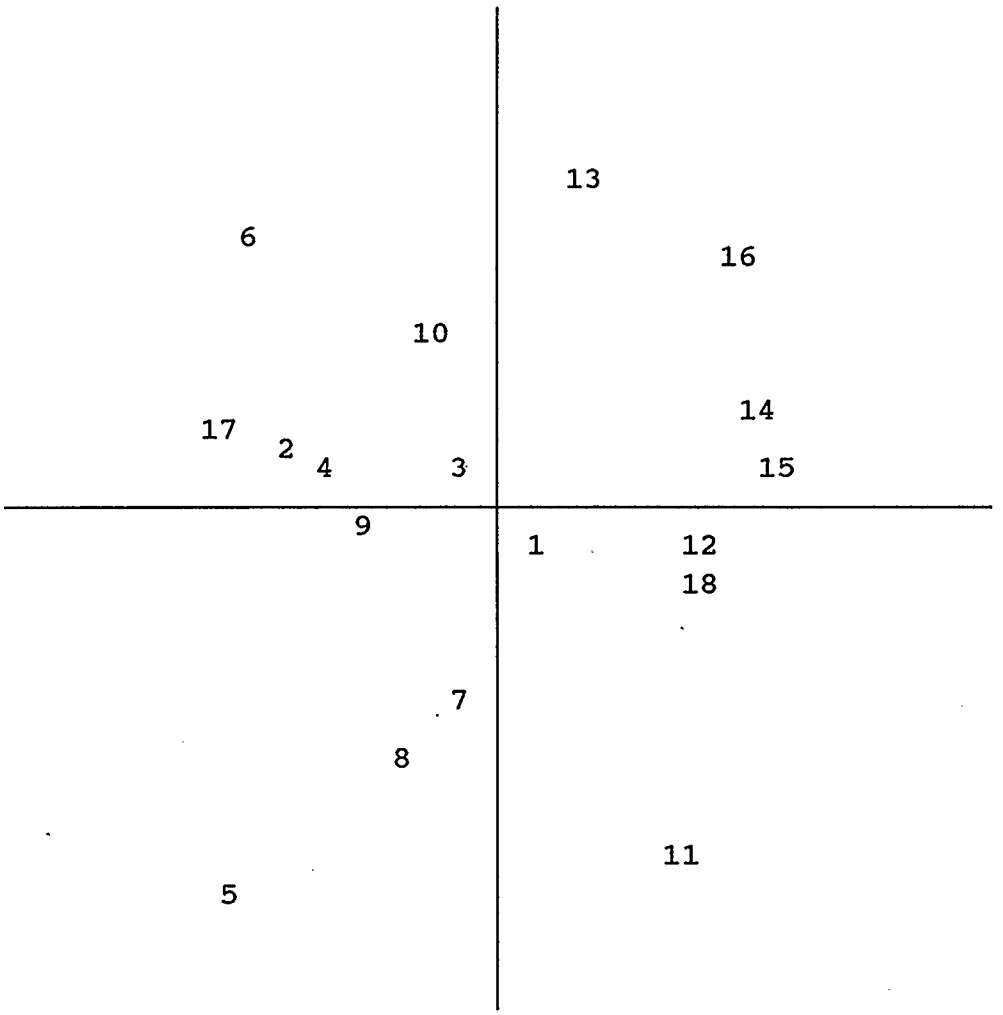

Figure 6. Stimulus Space for Non-Anxious/Depressed Group: Dimension 2 (x axis) versus Dimension 3 (y axis).

Note. Event Descriptions on Page 88.

Table 10. Event Descriptions for Figures 4, 5, and 6.

1. You make a driving mistake on the highway, and cut someone off.
2. You are stopped by police for driving illegally through an intersection.
3. You become "tongue-tied" when introduced to a small group of strangers.
4. You forget to turn the lights off after parking the car, and the battery runs down.
5. It's Monday morning and you realize that you have an awful lot of work to do.
6. Your application for a new and better job is rejected.
7. You have to ask a colleague to help you with something that you ought to be able to do yourself.
8. You're at work and your boss comes up and tells you that you're behind schedule on a project.
9. Someone you supervise tells you he's unhappy with his evaluation, and that he wants to discuss it with you.
10. Your doctor is rude to you.
11. A friend reminds you of a favour you said you'd do for her, but that you haven't been able to find time for yet.
12. You're at a party, and a group of friends begin to tease you.
13. It's your birthday, and you don't receive any cards.
14. You have an unexpected and quite bitter argument with a good friend.
15. You make a joke that someone you like takes the wrong way.
16. Your partner appears to be acting cool towards you.
17. You hear rumours that there may be layoffs at work.
18. Friends criticize you for yelling at a member of your family on Thanksgiving.

Table 11. Subject Weights and Matrix RSQs for Participants in the Non-Anxious/Depressed Group.

	Subject Weights			
Participant	Dim 1	Dim 2	Dim 3	RSQ
1	.8439	.1303	.3357	.842
2	.9192	.2307	.1477	.920
3	.4708	.7071	.4771	.949
4	.5729	.6723	.3447	.899
5	.7553	.6268	.1057	.975
6	.1008	.4682	.8014	.872
7	.0479	.0750	.9457	.902
8	.2737	.8429	.3921	.939
9	.8136	.0997	.4726	.895
10	.7695	.4526	.4252	.978
11	.2299	.9051	.2627	.941
12	.7545	.1381	.5970	.945
13	.6607	.0350	.6898	.914
14	.3275	.5681	.6518	.855
15	.8858	.2831	.2651	.935
16	.4505	.7245	.3810	.873
17	.8106	.0778	.4580	.873
18	.7440	.5933	.2054	.948
19	.4484	.8238	.0883	.887
20	.4980	.8333	.0481	.945
21	.5780	.4347	.6648	.965
22	.8126	.1279	.4485	.878

Subject weights and matrix RSQs for each of the twenty-two participants are presented in Table 11. Dimension one was generally considered most salient, and accounted for forty percent of the variance. Dimension two was next most salient and accounted for twenty-eight percent of the variance, and dimension three accounted for twenty-three percent of the variance. All twenty-two dissimilarity

matrices were exceptionally well accounted for by the scaled data, and ranged from .84 for participant one, to .98 for participant ten.

Interpreting the Solution

The first step in the interpretation of the solution consisted, again, of attempting to identify the properties that best differentiated the objects that grouped on the dimension poles. This process suggested relatively straightforward interpretations for each dimension. In contrast to the anxious/depresseds' solution, high manifestation of the differentiating properties were represented by the positive poles.

Dimension One. The first dimension appears to be measuring perceptions of events that are associated with feelings of incompetence. The events on the positive pole represent examples of mistakes that are clearly attributable to personal actions: "You make a driving mistake on the highway, and cut someone off"; "You are stopped by police for driving illegally through an intersection"; "You forget to turn the lights off after parking the car, and the battery runs down".

The events on the negative pole, in contrast, represent work-related stress that need not be attributed to personal actions: "Someone you supervise tells you that s/he is unhappy with his evaluation, and that s/he wants to discuss it with you"; "You hear rumours that there may be layoffs at

work"; "You're at work and your boss comes up and tells you that you're behind schedule on a project".

The apparent categorization on the basis of having acted in an incompetent manner suggests that the dimension is measuring a semantic schema that can be defined by the theme of "Incompetence".

Dimension Two. The second dimension appears to be measuring perceptions of interpersonal difficulties and concern over negative evaluation. The events on the positive pole represent difficulties that include examples of causing offence and of receiving negative evaluation: "You have an unexpected and quite bitter argument with a good friend"; "You make a joke that someone you like takes the wrong way"; "Your partner appears to be acting cool towards you".

The events on the negative pole, in contrast, represent examples of difficulties that are not particularly related to interpersonal issues: "It's Monday morning and you realize that you have an awful lot of work to do"; "You hear rumours that there may be layoffs at work"; "Your application for a new and better job is rejected".

The apparent categorization on the basis of perceived interpersonal problems suggests that the dimension represents a semantic schema that processes situations that are associated with negative evaluation. As such it was labelled "Negative Evaluation".

Dimension Three. It would appear that this dimension is measuring perceptions of general rejection or failure. The events on the positive pole contain examples of interpersonal and achievement related rejection: "It's your birthday and you don't receive any cards"; "Your application for a new and better job is rejected"; "Your partner appears to be acting cool towards you".

Those on the negative pole contain examples of events that would appear capable, in the main, of producing relatively mild admonishment from others: "It's Monday morning and you realize that you have an awful lot of work to do"; "A friend reminds you of a favour you said you'd do for him/her but that you haven't been able to find time for yet"; "You're at work and your boss comes up and tells you that you're behind schedule on a project".

The apparent categorization on the basis of degree of perceived rejection or personal failure suggests that the semantic schema responsible for the categorization should be defined by "Rejection".

Verifying the Interpretation. The non-anxious/ depressed group's mean responses to the Attribute Questionnaire were regressed onto the three dimensions. Inspection of the residual scatterplots revealed no significant failures of the multivariate assumptions. The results of the fourteen analyses are presented in Table 12.

Table 12. Regression of Attribute Questionnaire Scale Mean Ratings onto the Three Dimensions: Non-Anxious/Depressed Group.

		Normalized weights				
	Attribute Scale	Dim 1	Dim 2	Dim 3	Mult. R	
1.	Fear disapproval?	-.156	.531	-.388	.647	**a**
2.	Feel unlovable?	-.230	.756	.285	.884	**c**
3.	Situation threatening?	-.476	.056	-.123	.487	
4.	Not handle situation?	-.261	.374	.028	.475	
5.	Not handle emotions?	-.022	.363	.350	.531	
6.	Affect independence?	-.237	-.339	-.061	.406	
7.	Feel helpless?	-.057	-.324	.077	.328	
8.	Blame self?	.670	.285	-.253	.763	**b**
9.	Feel worthless?	-.242	.258	.103	.392	
10.	Feel angry?	.091	-.252	.426	.479	
11.	Feel incompetent?	.554	-.216	-.107	.620	
12.	Feel inferior?	-.103	.242	.007	.270	
13.	Feel anxious?	-.217	.147	-.379	.438	
14.	Feel sad?	-.287	.293	.572	.753	**b**

a < .05 **b** < .01

c < .001

Feeling unlovable was well accounted for by a linear combination of the three dimensions ($p < .001$), primarily by dimension two, self-blame was relatively well accounted for ($p < .01$), primarily by dimension one, and feeling sad was relatively well accounted for ($p < .01$), primarily by dimension three. Fear of disapproval was also reasonably well accounted for ($p < .05$), primarily by dimension two.

As with the anxious/depressed group's solution, the analyses provided support for the interpretations of the first and second dimensions. Clearly, the first dimension's correlation with self-blame is consistent with the perception that one has made mistakes, and with the conclusion that one is incompetent. The second dimension's correlations with feeling unlovable and fear of disapproval are also consistent with the interpretation that the dimension represents concern over negative interpersonal evaluation.

Comparison of the Dimensional Solutions

The dimensional solutions produced from both group's responses to the scaling procedure were compared by calculating the correlations for all dimension pairings. The results are presented in Table 13. Because coefficients were calculated for fifteen pairwise combinations, alpha was stepped down from .05 to .003 (i.e., .05 divided by fifteen). None of the coefficients reached significance using the conservative alpha.

Table 13. Correlations Between the Dimensional Solutions

	Anxious/Depressed			Non-Anxious/Depressed		
	Dim 1	Dim 2	Dim 3	Dim A	Dim B	Dim C
Dim 1	---	-.01	-.02	-.22	-.63	-.54
Dim 2		---	-.04	.55	.18	-.50
Dim 3			---	.47	-.62	-.01
Dim A				---	-.07	-.09
Dim B					---	.10
Dim C						---

Note. Dimensions A, B, and C represent the first second, and third dimensions for the non-anxious/depressed group.

Prediction of Therapist-Identified Schemata

The scaling procedure's capacity to predict therapist-identified schemata for the thirteen anxious/depressed participants involved in the second study was analyzed by determining the extent to which their highest weighted dimensions matched the core beliefs that were identified by their therapists.

As noted in the last chapter, estimates of the degree of agreement were obtained by asking three raters to assign each of the therapist-identified schemata to one of three categories that were derived from the dimension interpretations.

Table 14. Thirteen Participants' Highest Weighted Dimension Contrasted with Rater Judgements of Therapist-Identified Core Schemata.

	Highest Weighted	Rater Assignments		
Participant	Dimension	Rater 1	Rater 2	Rater 3
05	2	2	2	2
08	2	2	2	2
10	2	3	3	3
11	2	3	3	3
12	2	2	2	2
13	3	3	3	3
14	1	1	3	3
15	3	3	3	3
16	2	3	1	2
17	1	3	1	1
18	1	1	2	1
22	3	3	1	3
23	2	2	2	2

Table 14 presents the extent of observed agreement by contrasting each participant's highest weighted dimension against raters' assignments of therapist-identified schemata. Rater one produced 69% agreement (i.e., agreement for nine participants), rater two produced 54% (agreement for seven participants), and rater three produced 77% agreement (agreement for ten participants).

In order to control for the proportion of agreement that would have been expected by chance, three kappa coefficients were calculated. The kappa coefficient

represents a correlation coefficient that has been adjusted for an estimate of expected chance agreement, and can be interpreted in the conventional manner. Rater one generated a kappa of .53 ($p = .05$), rater two a kappa of .29 ($p > .05$), and rater three a kappa of .65 ($p < .05$).

CHAPTER 6

Discussion

This chapter consists of four sections. The first provides a review of the extent to which the scaling procedure was considered to have met the four criteria that were established to assess its psychometric adequacy. The second outlines the limitations of the study. The third offers a description of designs that might be used to extend the investigation of the procedure's construct validity, and the fourth provides a review of the issues that will be involved in translating the procedure into a clinically practical measure. The chapter will close with a summary and conclusion.

Review of the Procedure's Psychometric Adequacy

Criterion One. The Procedure Should Generate Evidence of Temporal Stability in a Reliability Analysis

Given that the minimum satisfying figure for test reliability is generally considered to be .70 (Kline, 1986), the coefficient of .74 that was obtained from the current analysis can be considered to lie within the acceptable range of reliability. The coefficient also compares quite favourably with existing measures of cognitive vulnerabilities. Robins (1985), for example, conducted a psychometric investigation of the Sociotropy-Autonomy Scale (Beck, Epstein, Harrison, & Emery, 1983), and reported test-retest reliabilities across a four to six-week period of .75

for Sociotropy, and .69 for Autonomy. Hewitt, Flett, Turnbull-Donovan, and Mikail (1991) also reported coefficients of .69, .66, and .60 over twelve weeks for the three subtests of the Multidimensional Perfectionism Scale.

Criterion Two. The Procedure Should Generate Evidence of Content Validity by Producing Dimensions/Schemata that are Consistent with Beck's Theory

The solution produced from the scaling analysis of the anxious/depressed group's similarity judgements had an exceptionally high fit to the judgements, and the three dimensions were interpreted as semantic schemata defined by the themes of Inferiority, Autonomy, and Dependency. By definition, the second and third dimensions are consistent with Beck's descriptions of Autonomy and Sociotropy. The Inferiority dimension is also consistent with the core issue of Competence that Beck and Emery (1985) have identified in anxiety disorders. However, given that they only described Competence/Inferiority as a presenting concern of anxious patients, that it was the most salient dimension in the scaling analysis, and that it was used by both depressed and anxious participants, it is necessary to evaluate the interpretation. Because Beck and Emery have suggested that Acceptance, Competence, and Control may derive from the themes of Sociotropy and Autonomy, it is important to address the question of whether the first dimension should be considered distinct conceptually from the others, or as a

derivative of one or both.

It is possible, for example, to consider the first dimension as a composite of the second and third's themes, in that attention to perceived social inadequacy combined with a sense of inferiority appears not only to capture the essence of the sense of vulnerability that is associated with sociotropy, but also the self-denigration that is associated with autonomy. The dimension's sense of failing in the eyes of others may therefore be akin to Hewitt and Flett's (1991) conceptualization of socially prescribed perfectionism which is defined as "the perceived need to attain standards and expectations prescribed by significant others" (p. 457).

It is also possible that the dimension is a derivative of the sociotropic theme. It can be argued that the belief that one is inferior is fundamentally a social conception, in that it is likely that it results from a process of social comparison (Adler, 1959). Given this, it is reasonable to assume that those who believe themselves inferior would attempt to maintain a sense of self-worth by appearing competent in the eyes of others and by avoiding negative social evaluation. One would also assume that activation of perceptions of inferiority are triggered by appraisals of having failed in comparison to, or in the estimation of, others. This, in effect, would mean that happiness is contingent upon the opinion of others, and

this, in turn, is consistent with the overarching theme of sociotropy.

In terms of conceptualizing both the first and third dimensions as derivatives of the sociotropic theme, it is important to recognize that neither Beck and his colleagues, nor those who have investigated sociotropy from different theoretical perspectives, have conceptualized the construct as unidimensional. For example, Beck, Brown, Steer, and Weissman (1991) recently reported the results of a factor analysis of the original 100-item Dysfunctional Attitude Scale (from which Weissman's 40-item scales were derived), and concluded that three of nine factors were consistent with the sociotropic theme; Need for Approval, Need to Please Others, and Disapproval-Dependence. Factor analysis of the Interpersonal Dependency Scale, which is grounded in psychoanalytic, social learning, and ethological theory, also identified three components in sociotropy/dependency; Emotional Reliance on Others, Assertion of Autonomy (which represents denial of attachment or autonomy), and Lack of Social Self-Confidence (Hirschfeld et al., 1977).

On theoretical grounds, then, it would seem appropriate to consider dimension one either as a composite of sociotropy and autonomy, or as a manifestation of sociotropy. This would support the assertions that all three dimensions are compatible with Beck's conceptualization of the cognitive vulnerabilities involved

in anxiety and depression, and that the procedure adequately sampled the intended construct.

Criterion Three. The Procedure Should Generate Evidence of Discriminant Validity by Producing a Different Dimensional Solution for a Non-Anxious/Depressed Group

It is clear that each group's solution represented unique dimensional spaces in that there were no significant dimensional correlations between the solutions, and in that two of the anxious/depressed dimensions were related to interpersonal/sociotropic concerns whereas only one was for the non-anxious/depressed. This supports the conclusion that different group perceptual spaces or categorizations were being measured. As such, the criterion was considered to have been supported.

Criterion Four. The Procedure Should Generate Evidence of Criterion-Related Validity by Predicting the "Core" Schemata of those Participants who Received Cognitive Therapy

This criterion received partial support, in that two of the three estimates of the procedure's concordance with therapist judgements of core schemata achieved statistical significance.

Conclusion

The following can be concluded. First, the scaling procedure exhibited an acceptable degree of reliability. Second, it provided adequate evidence of content validity in

that it appeared to measure semantic schemata that were consistent with Beck's model. Third, it generated evidence of discriminant validity in that it produced a different dimensional solution when administered to participants who were neither anxious nor depressed. Fourth, it produced some evidence of criterion-related validity in terms of its partial ability to predict therapist judgements of participants' core schemata.

Given that the process of construct validation is addressed through the accumulation of converging lines of evidence (Cronbach, 1984), and given that all four research criteria were at least partly met, it can be concluded that this initial evaluation of the procedure has generated evidence of construct validity, and that it appears to represent a useful method for measuring dysfunctional schemata in anxiety and depression.

Limitations of the Study

These conclusions need to be tempered, of course, by considering the limitations of the study. It is important to recognize, for example, that the single estimate of temporal stability involved a relatively brief inter-test period, and, as is true of all test-retest analyses, it is possible that the coefficient of stability was artificially inflated because of consistency that can be attributed to the effects of memory, rather than to genuine stability in the perceptions of the stimuli (Crocker & Algina, 1986).

Moreover, because of the small number of participants in the study, the reliability analysis was not restricted, as would have been preferred, to the responses of the clinically anxious and/or depressed.

It is clear, then, that the question of reliability in a clinical population has not been fully addressed, and that it will be important to conduct additional examinations of the procedure's degree of stability over extended time periods, and using additional participants. It will also be important to attempt to compute the measure's internal consistency in future investigations with clinical samples.

In terms of the analysis of content validity, it is important to recognize that the interpretation of the anxious/depressed group's third dimension was not verified by the regression analyses, and that it will be desirable to increase confidence in the interpretation. Because it is possible that meaningful statistical correlations with the items from the Attribute Questionnaire were attenuated by the small number of participants (eight) who weighted this dimension most highly, it will be desirable to increase the number of participants in order to compute separate multiple regressions for each group of participants who weigh each of the dimensions most highly (Kruskal & Wish, 1978).

Finally, it would be instructive to reconsider the process by which criterion-validity was examined. Although two of the three estimates of the procedure's concurrence

with therapist judgements of schemata were statistically significant, the actual correlations were quite modest (.53 and .65), and do not represent a particularly powerful or impressive degree of prediction. It is possible, however, that the process that was used to produce the estimates of concurrence may have misrepresented the true degree of convergence.

It is a basic tenet of psychometric research that "the scientific and practical utility of criterion validation depends as much on the measurement of the criterion as it does on the quality of the measurement instrument itself" (Carmines & Zeller, 1979, p. 18). There were a number of potential sources of error in the measure of the criterion. Perhaps most significantly, it can only be assumed that the therapist judgements of core schemata were, in fact, accurate. Given that identification of schemata can involve judgements of relatively ambiguous information (Safran et al., 1986), it is quite possible that some of the therapist's hypotheses may have been incorrect. In a related vein, the fact that the non-significant estimate of concordance was produced by the rater who had not received clinical training would suggest that clinical experience and familiarity with cognitive-behavioural theory was a factor in the rating process. It is also possible that the estimates were affected by not asking the therapists, who had first-hand experience of the participants' issues, to

match their personal judgements of core schemata with the three dimensions.

It would be desirable, then, to re-examine the question of criterion-related validity by obtaining a more rigorous determination of the criterion (for example, by using the consensus opinion of a therapist team), by asking the therapists to match their own judgements with the dimensional definitions, and, of course, by increasing the sample size beyond thirteen.

Extending the Analysis of Construct Validity

The preceding discussion indicates that while the results of the investigation of the scaling procedure's psychometric properties are quite promising, it will be important to confirm the findings, essentially by replicating and refining the basic research design. Because this project was conceptualized as an initial psychometric investigation, it would also seem important to consider some possibilities for extending the analysis of the procedure's construct validity. Four possibilities can be considered.

First, it would be instructive to conduct convergent and discriminant validation analyses of the procedure's performance in relation to the measures of cognitive vulnerabilities that are beginning to emerge in the literature such as the Sociotropy-Autonomy Scale (Beck et al., 1983; Clark & Beck, 1991), and the Multidimensional Perfectionism Scale (Hewitt et al., 1991). It would also be

instructive to include measures of related variables that have been developed within the psychodynamic tradition, such as the Interpersonal Dependency Inventory (Hirschfeld et al., 1977) and the Depressive Experiences Questionnaire (Blatt et al., 1982). Clearly, one would only expect high correlations between the specific perceptual categories that are measured by the scaling procedure and the particular belief systems with which they are hypothesized to be thematically related.

The attempts that have been made to validate Beck's descriptions of the relationship of sociotropy and autonomy to symptom profiles in depression (Beck, 1983) suggest a second approach for validating the scaling procedure (Persons et al., 1991; Peselow, Robins, Sanfilipo, Block, & Fieve, 1992; Robins, Block, & Peselow, 1989; Robins & Luten, 1991). Specifically, if the expected correlations among the autonomous and sociotropic symptom profiles and the three dimensions are obtained from administration to a clinical sample, this would support the interpretation that the procedure is measuring sociotropic and autonomy related semantic schemata.

A third approach would be to determine whether the scaling procedure can be substituted for the self-report inventories that have been used in investigations of what has become known as the congruency hypothesis (e.g., Hammen, Ellicott, & Gitlin, 1989; Robins, 1990; Segal et al., 1992).

This hypothesis is derived from Beck's model, and holds that only those events that match an individual's cognitive vulnerability are likely to trigger depression. If evidence of expected congruency is obtained (e.g., those high on dimension two becoming depressed after an experience of perceived failure), this would also lend support to the interpretation that the procedure is measuring the relevant semantic schemata.

Finally, one could administer the procedure to participants both before and after therapy, and, if changes in the expected direction are observed (such as a de-emphasis of an originally highly salient dimension), this would also provide evidence of construct validity.

Practical Considerations

If additional research supports the utility of using the scaling procedure as a measure of dysfunctional schemata in anxiety and depression, it will become necessary to develop software that will render it suitable for administration in clinical practice. Although the procedure takes less than five minutes to administer, and although it can readily be used in research applications (by utilizing the existing data base with SPSS), the process of handling, scoring, and interpreting clients' responses will need to be developed for clinical use. The obvious solution would be to develop a program that could transform the raw data from card-sorts into dissimilarity matrices, to enter these into

the appropriate statistical model (probably through interaction with SPSS), to run the model with the existing data base, and to provide interpretation of the output.

Summary and Conclusions

This study has demonstrated that it is possible to use multidimensional scaling as a measure of dysfunctional semantic schemata in clinical anxiety and depression. It has also provided corroborating evidence for two of Beck's theoretical propositions. First, it has generated evidence in support of the notion that the dysfunctional schematic organization operates within the perceptual system, insofar as it would appear that semantic schemata function to produce "top-down" perceptions of the environment in a manner that is consistent with core rules or motives. Second, by producing an interpretable solution from the responses of a mixed anxious and depressed sample, it provides support for Beck's recent position that both conditions result, in part, from the operation of common schemata.

Assuming that further investigations substantiate the psychometric findings, and that the procedure can be developed for convenient administration and scoring, the research will also have contributed to the resolution of an important problem. That is, it will have contributed to the development of a convenient and economical method, which does not require self-report, for identifying the core

cognitive processes in anxiety and depression that are typically addressed by cognitive-behavioural therapists. As such, it will offer a method for streamlining the therapeutic process, which may be particularly helpful for beginning therapists (Safran et al., 1986). Moreover, it will have produced a tool that can be used in explorations of the proposed role of the dysfunctional schema in the onset and maintenance of disorder, and in investigations that attempt to explain the effectiveness of cognitive therapy.

REFERENCES

Adler, A. (1959). The practice and theory of individual psychology. Totowa, NJ: Littlefield Adams.

Alloy, L. B., Hartlage, S., & Abramson, L. Y. (1988). Testing the cognitive diathesis-stress theories of depression: Issues of research design, conceptualization, and assessment. In L. B. Alloy (Ed.), Cognitive processes in depression (pp. 31-73). New York: Guilford.

American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed., rev.). Washington, DC: Author.

Arieti, S., & Bemporad, J. R. (1980). The psychological organization of depression. American Journal of Psychiatry, 137, 1360-1365.

Barnett, P. A., & Gotlib, I. H. (1988). Psychosocial functioning and depression: Distinguishing among antecedents, concomitants, and consequences. Psychological Bulletin, 104, 97-126.

Bartlett, F. (1932). Remembering. Cambridge, England: Cambridge University Press.

Beck, A. T. (1967). Depression: Clinical, experimental, and theoretical aspects. New York: Hoeber.

Beck, A. T. (1976). Cognitive therapy and the emotional disorders. New York: International Universities Press.

Beck, A. T. (1983). Cognitive therapy of depression: New perspectives. In P. J. Clayton & J. E. Barrett (Eds.), Treatment of depression: Old controversies and new approaches (pp. 265-290). New York: Raven.

Beck, A. T. (1984). Cognition and therapy. Archives of General Psychiatry, 41, 1112-1114.

Beck, A. T. (1987). Cognitive models of depression. Journal of Cognitive Psychotherapy, 1, 5-37.

Beck, A. T. (1988). Love is never enough. New York: Harper & Row.

Beck, A. T. (1991). Cognitive therapy: A 30-year retrospective. American Psychologist, 46, 368-375.

Beck, A. T., Brown, G., Steer, R. A., & Weissman, A. N. (1991). Factor analysis of the Dysfunctional Attitude Scale in a clinical population. Psychological Assessment, 3, 478-483.

Beck, A. T., & Emery, G. (1985). Anxiety disorders and phobias: A cognitive perspective. New York: Basic Books.

Beck, A. T., Epstein, N., Harrison, R. P., & Emery, G. (1983). Development of the sociotropy-autonomy scale: A measure of personality factors in psychopathology. Unpublished manuscript. University of Pennsylvania, Philadelphia.

Beck, A. T., & Freeman, A. (1990). Cognitive therapy of personality disorders. New York: Guilford.

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). Cognitive therapy of depression. New York: Guilford.

Beck, A. T., & Steer, R. A. (1987). Beck depression inventory manual. New York: Psychological Corporation/Harcourt.

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

Bellack, A. S., Hersen, M., & Lamparski, S. M. (1979). Role-play tests for assessing social skills: Are they valid? Are they useful? Journal of Consulting and Clinical Psychology, 47, 335-342.

Benjafield, J. G. (1992). Cognition. Englewood Cliffs, NJ: Prentice Hall.

Blatt, S. J., Quinlan, D. M., Chevron, E. S., McDonald, C., & Zuroff, D. (1982). Dependency and self-criticism: Psychological dimensions of depression. Journal of Consulting and Clinical Psychology, 50, 113-124.

Brewer, W. F., & Nakamura, G. V. (1984). The nature and functions of schemas. In R. S. Wyer Jr. & T. K. Srull (Eds.), Handbook of social cognition (Vol. 1) (pp. 119-160). Hillsdale NJ: Erlbaum.

Brewin, C. R. (1989). Cognitive change processes in psychotherapy. Psychological Review, 96, 379-394.

Burns, D. D. (1980). The new mood therapy. New York: Signet.

Buser, S. J. (1989). A counseling practitioner's primer to the use of multidimensional scaling. Journal of Counseling and Development. 67, 420-423.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validity by the multitrait-multimethod matrix. Psychological Bulletin, 56, 81-105.

Cane, D. B., Olinger, L. J., Gotlib, I. H., & Kuiper, N. A. (1986). Factor structure of the Dysfunctional Attitude Scale in a student population. Journal of Clinical Psychology, 42, 307-309.

Carmines, E. G., & Zeller, R. A. (1979). Reliability and validity assessment. Beverly Hills, CA: Sage.

Carroll, J. D., & Arabie, P. (1980). Multidimensional scaling. In M. R. Rosenzweig & L. W. Porter (Eds.), Annual Review of Psychology, 31, 607-649.

Clark, D. A., & Beck, A. T. (1989). Cognitive theory and therapy of anxiety and depression. In P. C. Kendall & D. Watson (Eds.), Anxiety and depression: Distinctive and overlapping features (pp. 379-411). San Diego: Academic.

Clark, D. A., & Beck, A. T. (1991). Personality factors in dysphoria: A psychometric refinement of Beck's Sociotropy-Autonomy Scale. Journal of Psychopathology and Behavioral Assessment, 13, 369-388.

Clark, L. A. (1989). The anxiety and depressive disorders: Descriptive psychopathology and differential diagnosis. In P. C. Kendall & D. Watson (Eds.), Anxiety and depression: Distinctive and overlapping features (pp. 83-129). San Diego: Academic.

Coyne, J. C. (1989). Thinking postcognitively about depression. In A. Freeman, K. M. Simon, L. E. Beutler & H. Arkowitz (Eds.), Comprehensive handbook of cognitive therapy (pp. 227-244). New York: Plenum.

Coyne, J. C., & Gotlib, I. (1986). Studying the role of cognition in depression: Well-trodden paths and cul-de-sacs. Cognitive Therapy and Research, 10, 695-705.

Crocker, L. & Algina, J. (1986). Introduction to classical and modern test theory. New York: Holt.

Cronbach, L. J. (1984). Essentials of psychological testing (4th ed.). New York: Harper & Row.

Davison, M. L. (1983). Multidimensional scaling. New York: Wiley.

Davison, M. L., Richards, P. S., & Rounds, J. B. (1986). Multidimensional scaling in counseling research and practice. Journal of Counseling and Development, 65, 178-184.

DeRubeis, R. J. & Beck, A. T. (1988). Cognitive therapy. In K. S. Dobson (Ed.), Handbook of cognitive-behavioral therapies (pp. 273-306). New York: Guilford.

Dobson, K. S., & Shaw, B. F. (1987). Specificity and stability of self-referent encoding in clinical depression. Journal of Abnormal Psychology, 96, 34-40.

Eaves, G., & Rush, A. J. (1984). Cognitive patterns in symptomatic and remitted unipolar depression. Journal of Abnormal Psychology, 93, 31-40.

Ellis, A. (1987). The impossibility of achieving consistently good mental health. American Psychologist, 42, 364-375.

Fitzgerald, L. F., & Hubert, L. J. (1987). Multidimensional scaling: Some possibilities for counseling psychology. Journal of Counseling Psychology, 34, 469-480.

Frank, J. D. (1985). Therapeutic components shared by all psychotherapies. In M. J. Mahoney & A. Freeman (Eds.), Cognition and psychotherapy (pp. 49-79). New York: Plenum.

Goldberg, J. O., & Shaw, B. F. (1989). The measurement of cognition in psychopathology: Clinical and research applications. In A. Freeman, K. M. Simon, L. E. Beutler & H. Arkowitz (Eds.), Comprehensive handbook of cognitive therapy (pp. 37-59). New York: Plenum.

Goldfried, M. R., Padawer, W., & Robins, C. (1984). Social anxiety and the semantic structure of heterosocial interactions. Journal of Abnormal Psychology, 93, 87-97.

Gotlib, I. H., & Cane, D. B. (1989). Self-report assessment of depression and anxiety. In P. C. Kendall & D. Watson (Eds.), Anxiety and depression: Distinctive and overlapping features (pp. 131-169). San Diego: Academic.

Greenberg, M. S., Vazquez, C. V., & Alloy, L. B. (1988). Depression versus anxiety: Differences in self- and other-schemata. In L. B. Alloy (Ed.). Cognitive processes in depression (pp. 109-142). New York: Guilford.

Haaga, D. A. F., & Beck, A. T. (1992). Cognitive therapy. In E. S. Paykel (Ed.), Handbook of affective disorders (2nd ed.) (pp. 511-523). New York: Guilford.

Haaga, D. A. F., Dyck, M. J., & Ernst, D. (1991). Empirical status of cognitive theory of depression. Psychological Bulletin, 110, 215-236.

Hamilton, E. W., & Abramson, L. Y. (1983). Cognitive patterns and major depressive disorder: A longitudinal study in a hospital setting. Journal of Abnormal Psychology, 92, 173-184.

Hammen, C. (1988). Depression and cognitions about personal stressful life events. In L. B. Alloy (Ed.), Cognitive processes in depression. (pp. 77-108). New York: Guilford.

Hammen, C., Ellicott, A., & Gitlin, M. (1989). Vulnerability to specific life events and prediction

of course of disorder in unipolar depressed patients. Canadian Journal of Behavioural Science, 24, 377-388.

Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. Journal of Personality and Social Psychology, 60, 456-470.

Hewitt, P. L., Flett, G. L., Turnbull-Donovan, W., & Mikail, S. F. (1991). The Multidimensional Perfectionism Scale: Reliability, validity, and psychometric properties in psychiatric samples. Psychological Assessment, 3, 464- 468.

Hirschfeld, R. M. A., Klerman, G. L., Gough, H. G., Barret, J., Korchin, S. J., & Chodoff, P. (1977). A measure of interpersonal dependency. Journal of Personality Assessment, 41, 610-618.

Hollon, S. D., Kendall, P. C., & Lumry, A. (1986). Specificity of depressotypic cognitions in clinical depression. Journal of Abnormal Psychology, 95, 52-59.

Hollon, S. D., Shelton, R. C., & Loosen, P. T. (1991). Cognitive therapy and pharmacotherapy of depression. Journal of Consulting and Clinical Psychology, 59, 88-99.

Ingram, R. E., Kendall, P. C., Smith, T. W., Donnell, C., & Ronan, K. (1987). Cognitive specificity in emotional

distress. Journal of Personality and Social Psychology, 53, 734-742.

Kendall, P. C., & Ingram, R. E. (1989). Cognitive-behavioral perspectives: Theory and research on depression and anxiety. In P. C. Kendall & D. Watson (Eds.), Anxiety and depression: Distinctive and overlapping features (pp. 27-53). San Diego: Academic.

Kline, P. (1986). A handbook of test construction: Introduction to psychometric design. New York: Methuen.

Kovacs, M., & Beck, A. T. (1978). Maladaptive cognitive structures in depression. American Journal of Psychiatry, 135, 525-533.

Kruskal, J. B., & Wish, M. (1978). Multidimensional scaling. Beverly Hills, CA: Sage.

Kuiper, N. A., Olinger, L. J., & MacDonald, M. R. (1988). Vulnerability and episodic cognitions in a self-worth contingency model of depression. In L. B. Alloy (Ed.), Cognitive processes in depression (pp. 289-309). New York: Guilford.

Landau, R. J. (1980). The role of semantic schemata in phobic word interpretation. Cognitive therapy and Research, 4, 427-434.

Landau, R. J., & Goldfried, M. R. (1981). The assessment of schemata: Unifying framework for cognitive,

behavioral, and traditional assessment. In P. C. Kendall & S. D. Hollon (Eds.), Assessment strategies for cognitive behavioral interventions (pp. 363-399). New York: Academic.

Markus, H., & Wurf, E. (1987). The dynamic self-concept: A social psychological perspective. Annual Review of Psychology, 38, 299-337.

Meichenbaum, D. (1985). Stress inoculation training. New York: Pergamon.

Merluzzi, T. V., & Boltwood, M. D. (1989). Cognitive assessment. In A. Freeman, K. M. Simon, L. E. Beutler & H. Arkowitz (Eds.), Comprehensive handbook of cognitive therapy (pp. 249-266). New York: Plenum.

Miranda, J., & Persons, J. B. (1988). Dysfunctional attitudes are mood-state dependent. Journal of Abnormal Psychology, 97, 76-79.

Miranda, J., Persons, J. B., & Byers, C. N. (1990). Endorsement of dysfunctional beliefs depends on current mood. Journal of Abnormal Psychology, 99, 237-241.

Neisser, U. (1976). Cognition and reality. San Francisco: Freeman.

Neisser, U. (1978). Anticipations, images, and introspection. Cognition, 6, 169-174.

Nietzel M. T., & Harris, M. J. (1990). Relationship of dependency and achievement/autonomy to depression. Clinical Psychology Review, 10, 279-297.

Oliver, J. M., & Baumgart, E. P. (1985). The Dysfunctional Attitude Scale: Psychometric properties and relation to depression in an unselected adult population. Cognitive Therapy and Research, 9, 161-167.

Persons, J. B., Miranda, J., & Perloff, J. M. (1991). Relationships between depressive symptoms and cognitive vulnerabilities of achievement and dependency. Cognitive Therapy and Research, 15, 221-235.

Peselow, E. D., Robins, C. J., Sanfilipo, M. P., Block, P., & Fieve, R. R. (1992). Sociotropy and autonomy: Relationship to antidepressant drug treatment and endogenous-nonendogenous dichotomy. Journal of Abnormal Psychology, 101, 479-486.

Rehm, L. P., & Marston, A. R. (1968). Reduction of social anxiety through modification of self-reinforcement: An instigation therapy technique. Journal of Consulting and Clinical Psychology, 32, 565-574.

Riskind, J. H., Beck, A. T., Berchick, R. J., Brown, G., & Steer, R. A. (1987). Reliability of DSM-III diagnoses for major depression and generalized anxiety disorder using the Structured Clinical Interview for DSM-III. Archives of General Psychiatry, 44, 817-820.

Riskind, J. H., & Rholes, W. S. (1984). Cognitive accessibility and the capacity of cognitions to predict future depression: A theoretical note. Cognitive Therapy and Research, 8, 1-12.

Robins, C. J. (1985). Construct validation of the Sociotropy-Autonomy Scale: A measure of vulnerability to depression. Paper presented at the annual meeting of the Eastern Psychological Association, Boston.

Robins, C. J. (1987). Social perception and heterosocial self-efficacy: A multidimensional scaling analysis. Cognitive Therapy and Research, 11, 197-214.

Robins, C. J. (1990). Congruence of personality and life events in depression. Journal of Abnormal Psychology, 99, 393-397.

Robins, C. J., Block, P., & Peselow, E. D. (1989). Relations of sociotropic and autonomous personality characteristics to specific symptoms in depressed patients. Journal of Abnormal Psychology, 98, 86-88.

Robins, C. J., & Luten, A. G. (1991). Sociotropy and autonomy: Differential patterns of clinical presentation in unipolar depression. Journal of Abnormal Psychology, 100, 74-77.

Rummelhart, D. E. (1984). Schemata and the cognitive system. In R. S. Wyer Jr. & T. K. Srull (Eds.), Handbook of social cognition (Vol. 1) (pp. 161-188). Hillsdale NJ: Erlbaum.

Safran, J. D., Segal, Z. V., Hill, C., & Whiffen, V. (1990). Refining strategies for research on self-representations in emotional disorders. Cognitive Therapy and Research, 14, 143-160.

Safran, J. D., Vallis, T. M., Segal, Z. V., & Shaw, B. F. (1986). Assessment of core cognitive processes in cognitive therapy. Cognitive Therapy and Research, 10, 509-526.

Sanford, A. J., & Garrod, S. C. (1981). Understanding written language: Explorations of comprehension beyond the sentence. New York: John Wiley.

Schank, R., & Abelson, R. (1977). Scripts, plans, goals, and understanding. Hillsdale, NJ: Erlbaum.

Schiffman, S. S., Reynolds, M. L., & Young, F. W. (1981). Introduction to multidimensional scaling. New York: Academic.

Segal, Z. V. (1988). Appraisal of the self-schema construct in cognitive models of depression. Psychological Bulletin, 103, 147-162.

Segal, Z. V., Hood, J. E., Shaw, B. F., & Higgins, E. T. (1988). A structural analysis of the self-schema construct in major depression. Cognitive Therapy and Research, 12, 471-485.

Segal, Z. V., & Shaw, B. F. (1988). Cognitive assessment: Issues and methods. In K. S. Dobson (Ed.), Handbook of cognitive-behavioral therapies (pp. 39-81). New York: Guilford.

Segal, Z. V., Shaw, B. F., & Vella, D. D. (1989). Life stress and depression: A test of the congruency hypothesis for life event content and depressive

subtype. Canadian Journal of Behavioural Science, 24, 389-400.

Segal, Z. V., Shaw, B. F., Vella, D. D., & Katz, R. (1992). Cognitive and life stress predictors of relapse in remitted unipolar depressed patients: Test of the congruency hypothesis. Journal of Abnormal Psychology, 101, 26-36.

Silverman, J. S., Silverman, J. A., & Eardley, D. A. (1984). Do maladaptive attitudes cause depression? Archives of General Psychiatry, 41, 28-30.

Spielberger, C. D., Gorsuch, R. L., Lushene, P., Vagg, P. R., & Jacobs, G. A. (1983). Manual for the state-trait anxiety inventory (Form Y). Palo Alto CA: Consulting Psychologists Press.

Spitzer, R. L., Williams, J. B. W., Gibbon, M., & First, M. B. (1990). Structured clinical interview for DSM-III-R -- Patient edition (with Psychotic Screen) -- SCID-P (W/PSYCHOTIC SCREEN) -- version 1.0. Washington, DC: American Psychiatric Press.

Spitzer, R. L., Williams, J. B. W., Gibbon, M., & First, M. B. (1990). Structured clinical interview for DSM-III-R -- Non-patient edition -- SCID-NP -- version 1.0. Washington DC: American Psychiatric Press.

Stiles, T. C., & Gotestam, K. G. (1988). The role of cognitive vulnerability factors in the development of depression: Theoretical and methodological

considerations. In C. Perris, I. M. Blackburn, & H. Perris (Eds.), Cognitive psychotherapy: Theory and practice (pp. 120-139). New York: Springer-Verlag.

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

Taylor, S. E., & Crocker, J. (1981). Schematic bases of social information processing. In E. T. Higgins, P. Herman, & M. P. Zanna (Eds.), The Ontario symposium in social personality and social psychology (Vol. 1, pp. 81-134). Hillsdale, NJ: Erlbaum.

Teasdale, J. D. (1988). Cognitive vulnerability to persistent depression. Cognition and Emotion, 2, 247-274.

Teasdale, J. D., & Dent, J. (1987). Cognitive vulnerability to depression: An investigation of two hypotheses. British Journal of Clinical Psychology, 26, 113-126.

Thorndyke, P. W., & Hayes-Roth, B. (1979). The use of schemata in the acquisition and transfer of knowledge. Cognitive Psychology, 11, 82-106.

Weissman, A. N. (1979). The dysfunctional attitude scale: A validation study. (Doctoral dissertation, University of Pennsylvania, 1978). Dissertation Abstracts International, 40, 1389B-1390B.

Weissman, A. N. (1980). Assessing depressogenic attitudes: A validation study. Paper presented at the 51st annual meeting of the Eastern Psychological Association,

Hartford, CT.

Williams, J. M. G., Watts, F. N., MacLeod, C., & Mathews, A. (1988). Cognitive psychology and emotional disorders. Chichester, England: John Wiley & Sons.

Winfrey, L. P. P., & Goldfried, M. R. (1986). Information processing and the human change process. In R. E. Ingram (Ed.), Information processing approaches to clinical psychology (pp. 241-258). New York: Academic.

Young, F. W., & Harris, D. F. (1990). Multidimensional scaling: Procedure ALSCAL. In M. J. Norusis/SPSS Inc., SPSS base system user's guide (pp. 396-461). Chicago: SPSS Inc.

Zuroff, D. C., & Mongrain, M. (1987). Dependency and self-criticism: Vulnerability factors for depressive affective states. Journal of Abnormal Psychology, 96, 14-22.

APPENDIX A

Specific Diagnoses for Anxious/Depressed Group

ID*	Specific Diagnosis
01	Major Depression **; Sub-threshold Agoraphobia w/o Panic Disorder; Social Phobia.
02	Major Depression; Panic Disorder w/o Agoraphobia.
03	Major Depression.
04	Panic Disorder w/o Agoraphobia; Generalized Anxiety Disorder.
05	Major Depression.
06	Major Depression.
07	Major Depression; Panic Disorder w/o Agoraphobia; Social Phobia; Simple Phobia.
08	Sub-threshold Major Depression; Panic Disorder w/o Agoraphobia; Sub-threshold Social Phobia.
09	Major Depression; Sub-threshold Social Phobia.
10	Dysthymia; Sub-threshold Social Phobia.
11	Social Phobia.
12	Major Depression; Social Phobia; Obsessive Compulsive Disorder.
13	Major Depression; Social Phobia; Sub-threshold Agoraphobia w/o Panic Disorder.
14	Major Depression; Sub-threshold Social Phobia; Sub-threshold Simple Phobia.
15	Major Depression **; Social Phobia.
16	Major Depression; Agoraphobia w/o Panic Disorder; Social Phobia; Simple Phobia.
17	Major Depression.
18	Major Depression.
19	Major Depression.
20	Dysthymia.
21	Dysthymia; Agoraphobia w/o Panic Disorder; Social Phobia.
22	Major Depression **: Panic Disorder w/o Agoraphobia; Obsessive Compulsive Disorder.
23	Major Depression.
24	Major Depression; Dysthymia; Obsessive Compulsive Disorder.
25	Social Phobia
26	Sub-threshold Major Depression; Simple Phobia.

27 Major Depression; Social Phobia.

28 Agoraphobia.

29 Dysthymia.

* Denotes participant identification code.

** Denotes "in partial remission".

APPENDIX B

Participant Consent Form

PARTICIPANT CONSENT FORM

I _____ have been asked to participate in a research project that involves an investigation of a psychological instrument which is intended to be used with patients in therapy. The instrument has been designed to measure perceptions of events that may be associated with varying degrees and types of psychological distress. The project is being conducted by Mr. Bill McConnell, Chartered Psychologist, and currently Graduate Student in Educational Psychology at the University of Calgary.

If I consent to participate, I understand that I will be asked to meet with Mr. McConnell on one or two occasions. During the first meeting I will be asked to complete three questionnaires, make judgements about a set of events, and be interviewed about current and past psychological difficulties. In the second meeting (one or two weeks after the first) I will be asked to complete two of the original questionnaires and again make judgements about a set of events.

I understand that if I receive Cognitive Therapy from Mental Health Services, my therapist may be approached by Mr. McConnell and asked to complete a very brief questionnaire about specific beliefs that may be identified as related to my presenting concerns. I understand that if I am on the waiting-list for Mental Health Services, information from the interview of current and past psychological difficulties will be released to my assigned therapist. I also understand that, in order to ensure consistent practice by all personnel associated with this project, administration of the interview of psychological difficulties may be audiotaped.

I have been assured that all information will be held as strictly confidential, and that all questionnaires and any audiotapes will be labelled with an anonymous code number.

I understand that I have a right to withdraw from the study at any time, and that this would in no way affect my receiving treatment.

I understand that I can request the results of any questionnaire that I complete, and also a summary of the results of the study.

I understand that this research has been approved by the Education Joint Research Ethics Committee at the University of Calgary, by the Calgary District Hospital Group Research Committee, by an Alberta Mental Health Services ethics committee, and by the President of Grande Prairie Regional College. If I have any complaints, I may submit them in writing to Dr. J. H. Mueller, Chair of the Educational Psychology Ethics Committee, Department of Educational Psychology, University of Calgary, 2500 University Drive N.W., Calgary, Alberta, T2N 1N4.

I have read and understood the above information, and any questions I had have been answered to my satisfaction. I have been given a copy of this consent form for my own records. I hereby give my consent to participate in this study.

_____ _____

Signature of Participant Date

_____

Witness

APPENDIX C

Therapist Questionnaire

Date: _____

To: _____

From: Bill McConnell

Re: _____ Code: _____

As you are probably aware, your patient is participating in my doctoral research project, which involves an attempt to validate a new method of measuring schemata. The patient completed the experimental procedure at the beginning of therapy, and one of the questions I'm most interested in is whether the schemata or beliefs identified by my measure are comparable to those identified during the therapeutic process.

I would really appreciate it if you would take the time to record the "core" schemata, or beliefs, that you think are most relevant to the patient's presenting problems. By "schemata" I'm thinking of the important beliefs or "dysfunctional attitudes" that Beck and his colleagues have written about (e.g., "I'm worthless or unlovable"; "I must be completely successful in <u>everything</u> that I do" etc.). These would be the kinds of beliefs that patients may not initially be aware of, and which probably should be modified in order to reduce the probability of relapse.

Your impressions of this patient's schemata can be recorded on the attached sheet. If you find that more than one belief seems to be relevant, it would be helpful if you could rank-order them, with #1 being the most salient. The sheet can then be returned to Dr. Mothersill who will pass it on to me. Dr. Mothersill would also be able to answer any questions about this procedure. I hope to have all the data analyzed by February or March of next year, and I will, of course, provide you with a summary of how things work out.

Thank You!

TQ

CODE _____ DATE _____

Please record the patient's schemata below.

1.

2.

3.

4.

Completed forms should be returned to Dr. Mothersill

APPENDIX D

Rater Questionnaire

December 1992

Dear,

Many thanks for agreeing to act as a rater for my doctoral project. As you may know, I have been exploring a multidimensional scaling procedure as a measure of dysfunctional schemata in anxiety and depression. Beck argues that dysfunctional schemata distort interpretations of the environment, and produce, or at least maintain, affective disorder. The procedure allows me to identify, and quantify, the most salient dimensions that respondents use in perceptions of upsetting events. From this, I can make inferences about the contents of their schemata.

Part of my study involves analysis of the scaling procedure's predictive power. I administered the procedure to thirteen patients at the beginning of therapy, and asked their therapists to record the dysfunctional beliefs or self-perceptions that were identified as playing a causal role in the patients' problems.

In order to conduct the analysis, I would ask that you first read the three categories that are described on the next page. They are derived from the core schematic themes that were identified in the scaling analysis. Each contains a profile that describes a driving motive, behaviours that are driven by the motive, situations that threaten self-worth, and thoughts or feelings that are experienced when depressed.

I would next ask that you read the beliefs or self-perceptions that were recorded for each of the thirteen patients, and that you assign each belief/perception to the category with which you think it is most consistent (even if the fit is imperfect). Each patient's beliefs are recorded on pages three to fifteen, and item number one was considered most important by the therapist. The category assignments can be recorded in the space after each item.

Because the beliefs/perceptions were obtained when the patients were depressed, it is perhaps most important that you base your judgements on the category profile descriptions of the thoughts and feelings that are experienced while depressed. Also, you are not required to assign all of a patient's beliefs/perceptions to the same category. I have provided an example of a completed rating on page two.

If you have any questions about this process please call me at 539-2739, or at 538-4156. Once again, my thanks for your assistance, and I look forward to receiving your selections.

Bill McConnell

CATEGORY A: INFERIORITY

The driving motive of individuals who fit this category is to appear competent in the eyes of others. They characteristically engage in a significant amount of impression management in order to minimize the possibility of having their incompetence exposed. Their self-worth is particularly threatened when they perceive themselves as having acted in an inept manner, or when they receive criticism from others. When depressed, they experience a strong sense of not measuring up to others, of being incompetent and inadequate, and of being inferior.

CATEGORY B: AUTONOMY

The driving motive of individuals who fit this category is to be independent and successful. They characteristically have high self-expectations, and act in ways to maximize control over their environments and minimize the possibility of failure. Their self-worth is particularly threatened by goal frustration and by perceived failure. When depressed, they engage in self-criticism, and tend to view themselves as worthless, and as failures. They also tend to experience guilt, and a strong sense of powerlessness. In particular, they may believe that they have lost control of their environments, or of themselves.

CATEGORY C: DEPENDENCE

The driving motive of individuals who fit this category is to be accepted, and approved of, by others. They characteristically act in ways to please others and to secure interpersonal attachments. Their self-worth is particularly threatened by perceived rejection, abandonment, or loss of relationships. When depressed, they tend to dwell on the lost attachment, and to blame the loss on personal, socially undesirable characteristics. In particular, they tend to view themselves as undesirable, unattractive, unlovable, and unacceptable.

EXAMPLE

---

1. Is afraid that people think less of him when he makes mistakes.

Although it could be argued that this item fits any one of the categories, it was assigned to **A** (Inferiority), because it is highly suggestive of a fear of negative evaluation as a result of acting in an incompetent manner.

That people will think less of him rather than reject him, and that there is no suggestion that he feels unlovable, is consistent with the fear that he doesn't measure up to others, and is therefore more consistent with Inferiority than Dependence.

That he fears "making mistakes" rather than failure, and that there is no suggestion of self-criticism, is more consistent with Inferiority than Autonomy.

2. He fears that he will do horrible things.

This item was assigned to **B** (Autonomy), because it is highly suggestive of a fear of loss of self-control, and therefore gives the impression of an individual who would normally pride himself on being autonomous, and "in" control.

Neither category A nor C was considered because there is no suggestion that the "horrible things" would necessarily lead to criticism or rejection by others.

THESE EXAMPLES SHOW THE REASONING BEHIND THE PARTICULAR CHOICES. YOU NEED ONLY INDICATE THE CATEGORY LETTER FOR EACH ITEM.

PATIENT NUMBER ONE

---

1. Unrelenting standards to meet high expectations of oneself at a high cost.

_____

2. Sense of incompetence or failure to meet unrealistic standards.

_____

3. Worth is measured in terms of unrealistic accomplishments.

_____

PATIENT NUMBER TWO

---

1. Sacrifices one's needs as a way of controlling others.

_____

2. Fear of losing self-control.

_____

3. Recurrent feelings of shame.

_____

PATIENT NUMBER THREE

---

1. I do not get enough love and attention.

_____

2. No-one is there to meet my needs.

_____

3. Fear that one will lose significant others.

_____

4. Expectation that others will hurt, manipulate or take advantage.

_____

PATIENT NUMBER FOUR

---

1. Unable to function without a man.

_____

2. One's need for nurturance will never be met.

_____

3. Fear of isolation.

_____

PATIENT NUMBER FIVE

---

1. Failure.

_____

2. Vulnerability.

_____

3. Fear of losing self-control.

_____

PATIENT NUMBER SIX

---

1. Subjugation
   This patient grew up experiencing extreme neglect. She had limited experiences of being important to her caregivers, and her behaviours were regarded as intrusive and requiring control. At age 19 she married a violent, abusive man whose control reinforced her fears. She was required to be submissive to avoid abuse. As a result, she ignored her own desires/wishes and is now just beginning to believe that she has a right to establish independent goals.

---

2. Self-sacrifice
   Patient developed fundamentalist Christian beliefs which required her to remain with her husband. She adopted a care-taking role. (He would frequently threaten suicide to manipulate her behaviours). She did not leave for 40 years because she felt guilt and responsibility for his life. Paradoxically, it was in remaining that she developed a pseudo self-esteem. Certainly this woman lived her life lacking a sense of self.

PATIENT NUMBER SEVEN

---

1. Guilt/punishment
   Patient's emotional distress is significantly maintained by a schema that she is capable of causing irreparable harm to others by her behaviours. Patient did obtain a sense of worthiness from her father. He is recently deceased and she is experiencing tremendous loss. Her father's death occurred following her marital separation. She wonders whether she is now experiencing punishment from God.

---

2. Failure
   Patient's separation has reinforced schemas of inability. This theme is also present in her self-report of her inadequacies which, undoubtedly, originated from her mother's descriptions of her.

---

3. Self-sacrifice
   This schema was initially developed in her family of origin. Patient is an oldest child and assumed a care-taking role. Later, this role was repeated when she became a mother at a young age, and by her choice of career (volunteerism, social work).

PATIENT NUMBER EIGHT

---

1. Feels unlovable (attachment/loss).

_____

2. Subjugation.

_____

3. Guilt/punishment.

_____

PATIENT NUMBER NINE

---

1. Shame, guilt, and worthlessness.

_____

2. Feels defective and undesirable.

_____

3. Subjugation/lack of individuation.

_____

4. Social isolation/alienation.

_____

PATIENT NUMBER TEN

---

1. Believes that others deserve and are entitled to preferential treatment.

_____

2. Unlovable, something about him makes him this way. He has to be kind and generous and giving to others.

_____

PATIENT NUMBER ELEVEN

---

1. Has high standards for his behaviour, and feels unworthy unless he is conforming and performing.

_____

2. Has fears of being rejected and abandoned, unless he is conforming and performing.

_____

PATIENT NUMBER TWELVE

---

1. I'm a horrible person - bad mother; awful wife; if people really knew what I was like, they'd reject me.

---

2. My mother never really loved me; I missed out on so many things; bad things have happened to me; I never could just be a child . . .

PATIENT THIRTEEN

---

1. I must be successful in everything that I do.

_____

2. Being successful maintains others' approval of me.

_____