Application of the Transtheoretical Model of Change to Binge Eating and Smoking

by

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Abstract

Applicability of the stage of change and decisional balance constructs for bingers and smokers was examined in a study of 191 participants; bingers (n = 47), smokers (n = 80), and controls (n = 64). The Stage of Change Inventory (SCI) was cross-validated with the University of Rhode Island Change Assessment (URICA) scale and used to assign bingers and smokers to one of five stages of change; precontemplation, contemplation, action, maintenance, and recovery. Psychological distress, the characteristics of binge eating and smoking, and the pros and cons of behavioural change were evaluated as a function of the stages of change. Although an increase in the con scores from precontemplation to action did not support the weak principle of the decisional balance. an increase in the pros of behavioural change from precontemplation to action provided support for the strong principle for bingers and smokers. Results of the Brief Symptom Inventory (BSI) indicated that psychological distress was not related to stage of change for bingers or smokers. However, bingers were found to score significantly higher than controls on the Global Severity Index (GSI) of the BSI. Several measures were used to further explore the phenomenology of binge eating and smoking. Results of the Binge Eating Adjective Checklist (BEAC) and Smoking Adjective Checklist (SAC) suggested that both behaviours serve a function in reducing the amount of psychological distress experienced by participants. For bingers, degree of loss of control and negative affect were found to vary as a function of stage of change, with precontemplators experiencing the least negative consequences associated with their behaviour and action-takers the most. The overall findings support the applicability of the transtheoretical model for bingers and smokers and further suggest that stage of change is related to characteristics of binge eating such as negative affect and loss of control.

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Introduction

An increased awareness of health-related issues and behaviours has contributed to the development of programs and techniques to assist individuals in changing their behaviour (Prochaska, Norcross, & DiClemente, 1994). In 1982, Prochaska and DiClemente developed a therapeutic approach based on a synthesis of the processes of change found to be common among 18 different therapy systems, known as the transtheoretical model. This integrative model of behavioural change was extended to include addictive and problem behaviours such as smoking (Prochaska, & DiClemente, 1983) and weight control (O'Connell, & Velicer, 1988). A further construct of the model, decisional balance, has been found to vary as a function of an individual's motivation to change (Prochaska, 1994).

The present study involved an evaluation of the applicability of the transtheoretical model and decisional balance to binge eating and smoking. Individuals at different stages of changing their binge eating and smoking were examined in terms of the consequences affecting their decision to change their behaviour. Further, the psychological distress experienced by these individuals relative to participants that have never smoked or binged was examined overall and as a function of stage of change. Associated features that characterize binge eating and smoking were examined such as the affective experience of the behaviour, loss of control, frequency, and age-related factors.

The Stages of Change

Based on research concerning how people intentionally change, the core construct of the transtheoretical model is a series of stages representing various degrees of motivational readiness to change. The stages that have been identified by Prochaska, DiClemente, and Norcross (1992) include precontemplation, contemplation, action, and maintenance.

Precontemplation is characterized by a lack of intention to change a behaviour in the future. Individuals may be unaware of a problem or feel that a behaviour is not problematic at all. Contemplation is characterized by an awareness that a problem exists and careful assessment of the pros and cons of behavioural change. Action represents an active modification of behaviour in order to overcome the problem. Maintenance is considered a continuation, not an absence of change in which individuals work to prevent relapse from 6 months after action has taken place to termination of the problem.

Thus far, evaluation of a stage of change beyond maintenance has not occurred. In a study predicting smoking status, Velicer, DiClemente, Prochaska, and Brandenburg (1985) distinguish between recent and long-term quitters. A 6-month critical period was used to classify quitters as either recent or long-term, a distinction they equated with the action and maintenance stages of change. Prochaska and DiClemente (1982) note that for some individuals, change results in the successful termination of a problem behaviour. However, although long-term abstinence and termination have been discussed in the literature, the characteristics associated with such a stage have not been examined as a construct of the transtheoretical model. Absolute recovery from a problem behaviour may warrant the identification of a stage beyond maintenance in which an individual is no longer actively working to prevent relapse, and no longer considers the previous behaviour as a current problem, or anticipates its re-emergence in the future. A staging instrument developed for eating disordered behaviours by Davis (1996), includes an item to assess the recovery stage of change in accordance with the above-mentioned criteria.

Decisional Balance

A further consideration in modifying behaviour is the decision making process, or evaluation of the pros and cons of behavioural change. Janis and Mann (1977) proposed a model to identify the motivational and cognitive considerations of decision making known as the Decisional Balance Sheet of Incentives. The model categorizes decision making in terms of the anticipated gains and losses that will result for both the individual and his/her reference group with regard to a particular choice. Further, decisions are evaluated in terms of material or emotional impact that may result from a particular choice. Janis and Mann have identified the following categories as important considerations in the decision making process: (a) utilitarian gains and losses for self, (b) utilitarian gains and losses for others, (c) self-approval or self-disapproval, and (d) approval or disapproval from significant others. Thus, the model proposes that any decision made by an individual to change a given behaviour involves an examination of both the positive and negative effects that the change will have on the individual and others. Further, a behavioural objective is viewed in terms of either the physical or affective consequence, such as monetary gain or increased self-esteem (Prochaska, Norcross, et al., 1994).

Many aspects of the transtheoretical model have roots in psychotherapeutic interventions (McConnaughy, Prochaska & Velicer, 1983). From a clinical perspective, discovering an individual's readiness to change can prove advantageous to the timing and selection of intervention procedures. However, application of the transtheoretical model has evolved beyond the psychotherapeutic situation to include a wide range of behaviours (Prochaska, Norcross, et al., 1994). Although diverse in scope, the types of behaviours to which the model has most widely been applied include those with consequences for physical

and psychological well-being (Prochaska, Velicer, et al., 1994). Thus far, the majority of research has focussed on applying the stages of change and decisional balance constructs to smoking cessation (Prochaska, & DiClemente, 1984).

Smoking

Smoking is the most frequently investigated of all health-related behaviours in relation to the transtheoretical model (Dijkstra, De Vries, Roijackers & van Breukelen, 1998; Prochaska & DiClemente, 1984). Initially, the stages of change concept developed as a result of an empirical investigation into the processes of change used by smokers who quit on their own compared to smokers involved in two different therapy programs (DiClemente & Prochaska, 1982). Four stages of change were identified as important to the goal of smoking cessation and maintenance: (a) thinking about quitting (contemplation); (b) becoming determined to quit (decision making); (c) actively modifying the behaviour (action); and (d) maintaining cessation of the behaviour (maintenance). Subsequent investigation by Prochaska and DiClemente (1983) resulted in some modification of the model to include the addition of a precontemplative stage and a shift in the emphasis placed on decision making. Refinement of the stages of change model in smoking cessation has continued as several studies have attempted to replicate these early findings (Dijkstra, Bakker & De Vries, 1997; Prochaska, Crimi, Lapsanski, Martel & Reid, 1982; Prochaska, DiClemente, Velicer, Ginpil & Norcross, 1985).

A study by Prochaska, Velicer, DiClemente, and Fava (1988) investigated the processes of change used by 970 smokers as they progressed through the various stages of change. Results of this study confirmed the existence of distinct stages of smoking cessation (precontemplation, contemplation, action, maintenance, and relapse). Further validation of the

stages of change model was achieved through an analysis of the stages of change for smoking cessation (DiClemente, Prochaska, Fairhurst, Velicer, Velasquez & Rossi, 1991). The study investigated the smoking behaviour and attitude towards smoking of participants in the precontemplative, contemplative, and preparation stages of change. Results indicated stage of change was highly correlated with number of attempts to quit smoking, and successful cessation at 1- and 6-month follow-up.

Decisional balance for smoking has been investigated as a predictive measure for assessing smoking status (Velicer, et al., 1985). The relative importance assigned to the pros and cons of quitting smoking was found to successfully differentiate between the five stages of change for all 960 participants. As well, the decisional balance measure proved successful in predicting smoking status at a 6-month follow-up. Thus, support for the transtheoretical model of change has been demonstrated through many investigations of smoking cessation. However, evidence also suggests that a more universal application of the model to other problem behaviours yields similar results (Prochaska, Velicer, et al., 1994).

Several studies have illustrated the clinical utility of matching treatment to the client's stage of change (DiClemente et al., 1991; Velicer, et al., 1985). For example, Levy (1997) found in a study of bulimia nervosa that subjects preferred treatment approaches compatible with their current stage of change. The application of the transtheoretical model to behavioural change has been supported in studies on smoking (Prochaska, Velicer, Guadagnole, Rossi & DiClemente, 1991), weight control (Prochaska, Norcross, Fowler, Follick & Abram, 1992), alcoholism (DiClemente, & Hughes, 1990), opiate addiction (Tejero, Trujols, Hernandez, de los Cobos & Casas, 1997), and eating disorders (Franko, 1997; Ward, Troop, Todd & Treasure, 1996). Thus, the ability to determine a subject's readiness for change has implications for

treatment as demonstrated in a weight loss study by O'Connell, and Velicer (1988). The results of this study indicate the combination of stage of change and decisional balance provides an effective instrument for understanding change and enhancing treatment planning.

The Strong and Weak Principles of Change

Prochaska, Velicer, et al. (1994) investigated the relationship between stage of change and decisional balance for 12 problem behaviours; smoking cessation, cocaine cessation, weight control, high-fat diets, adolescent delinquent behaviours, safer sex, condom use, sunscreen use, radon gas exposure, exercise acquisition, mammography screening, and physician's preventive practices with smokers. Results indicated the same pattern of pros and cons at each stage of change for all 12 behaviours. In the precontemplation stage, the cons for changing a behaviour outweigh the pros. Progress to the action stage involves an increase in the evaluation of the pros of changing a behaviour and a decrease in the cons. Thus, a crossover occurs between the pros and cons with progress from precontemplation to action. A decrease in the relevance of both pros and cons occurs with progression towards maintenance. Based on the results of this study, Prochaska (1994) identified two principles of change:

> The strong principle states that progression from precontemplation to action is a function of approximately a 1 standard deviation increase in the pros of a health behavior change. The weak principle states that progression from precontemplation to action is a function of approximately a 0.5 standard deviation decrease in the cons of a health behavior change. (Prochaska, 1994, p.1)

Dijkstra, et al. (1996) conducted a study of smoking cessation in a Dutch population which yielded results compatible with the pattern of pros and cons established by Prochaska (1994). Further, Dijkstra, et al. (1997) found that the progression from precontemplation to

contemplation can be determined by an individuals' perception of the advantages of modifying a behaviour.

The Transtheoretical Model and Binge Eating

Binge eating was identified by Stunkard (1959) as an eating disturbance occurring within a subset of obese patients who reported consuming vast quantities of food in a short period of time. More recently, the fourth edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV, American Psychiatric Association, 1994) has outlined a set of research criteria pertaining to Binge-Eating Disorder (BED); recurrent episodes of binge eating characterized by the consumption of large amounts of food, a sense of loss of control over intake, marked distress, and an absence of compensatory behaviours such as purging or exercising. Discrepancies exist in the research regarding the use of the term "binge". This has resulted in considerable variability in the composition of samples studied and their findings (Brody, Walsh & Devlin, 1994; Johnson, Carr-Nangle, Nangle, Antony & Zayfert, 1997). In a study of 243 women, Beglin and Fairburn (1992) determined that a subject's perceived loss of control rather than the actual quantity of food consumed was more important in defining a binge episode. Further, Niego, Pratt, and Agras (1997) proposed that the amount of food should be considered secondary to the psychological experience in defining binge eating.

Although BED is primarily associated with overweight and obese individuals, evidence exists to support the occurrence of binge eating episodes in subjects of varying weights (de Zwann, 1997; Castonguay, Eldredge & Agras, 1995). A review of binge eating by Wardle and Beinhart (1981) concluded that some form of binge eating is evident in obese, normal weight, and underweight groups. Reported prevalence rates of BED vary from approximately 0.7% - 4% in nonpatient community samples, and 15% - 55% for people who attend weight-control

programs (DSM-IV, 1994; Telch, Agras, Rossiter, Wilfley & Kenardy, 1990). A multisite field trial involving 1,984 participants determined that several patterns of episodic overeating exist, with fluctuations in prevalence rates depending on the set of criteria imposed on the sample (Spitzer et al., 1992). For example, in a college sample, reported rates varied from 39% for episodic overeating to 2.7% for BED. Typically, females are approximately 1.5 times more likely to exhibit a pattern of binge eating behaviour than males according to DSM-IV (APA, 1994)..

Presently, the transtheoretical model has not been applied to the distinct behaviour of binge eating in the absence of related eating disorder criteria for anorexia nervosa (AN) or bulimia nervosa (BN). Franko (1997) studied a group of 16 subjects with BN during 12 weeks of cognitive-behavioural group therapy. Results of the study indicated that subjects who were able to decrease binge frequency over the course of treatment were at more advanced stages of change at pretreatment compared to those with negative outcomes. Another application of the transtheoretical model involved a sample of 35 AN subjects in a study conducted by Ward et al. (1996). An examination of the stages and processes of change among AN subjects indicated that different processes of change characterized each stage, with patients relying on certain processes throughout the course of treatment. Several limitations were discussed by the authors regarding the applicability of the model to eating disorders. It appears that discrepancy arose between clinician's impression of stage of change and the stage determined as a function of the questionnaire administered to subjects. The complex nature of eating disorders may complicate stage assignment as some individuals may simultaneously engage in behaviours and attitudes representative of more than one stage. Further, the study of eating disorders compared to other

problem behaviours may be complicated by the fact that binge eating is subjective compared to behaviours where abstinence is the final goal of treatment (Ward et al.).

A final study by Levy (1997) lends support to the application of the transtheoretical model of change to BN. Stages of change, processes of change and treatment preferences were assessed for 139 subjects with a past or current diagnosis of BN. Results indicated that subjects preferred treatment approaches that were compatible with their current stage and process of change. Overall, evidence supports the application of the transtheoretical model of change to eating disorders, specifically bulimia nervosa. Although binge eating as a distinct behaviour has not been investigated, application of the stages of change to AN and BN lends support to the investigation of the model in the absence of compensatory behaviours. Further, research to date has not been published on the decisional balance construct of the transtheoretical model as it might apply to the behaviour of binge eating.

Binge Eating and Psychopathology

A higher incidence of psychopathology among individuals diagnosed with BED has been demonstrated in several studies (Eldredge, Lockes, & Horowitz, 1998; Fairburn et al, 1998; Villejo, Humphrey & Kirschenbaum, 1997; Wilfley et al, 1993). A comparison of obese binge eaters and obese nonbinge eaters noted an increase in psychiatric symptomatology among those who binge (De Zwann et al., 1994; Marcus, Wing & Hopkins, 1988). Similar results were reported by Yanovski, Nelson, Dubbert & Spitzer (1993) as subjects with BED were more likely than those without BED to receive lifetime diagnoses of panic disorder, major depression, borderline personality disorder, and avoidant personality disorder. Contrary results were reported by Brody et al. (1994) in which measures of psychopathology failed to differentiate between subjects with and without BED. Brody et al. proposed that a weight

continuum may exist to explain the varying degrees of symptomatology exhibited among obese subjects, suggesting that those with the greatest weight problems experience the most distress. Niego et al. (1997) identified a positive relationship between binge eating severity and degree of psychopathology. Further studies have found similar results in the relationship between obesity, binge eating and psychopathology (Telch & Agras, 1994; Vendetti, Wing, Jakicic, Butler & Marcus, 1996). While obesity was not found to relate to psychopathology, a positive relationship was identified between binge eating severity and symptoms of psychopathology. Therefore, the psychological well-being of bingers may be related to additional characteristics of the binge eating experience (e.g.., frequency, volume of food consumed, affective response, and sense loss of control). A study of substance addicts during the first year of recovery indicates that psychological symptoms were found to decrease as a function of substance-free time (Sutherland, 1997). Thus, the level of psychological distress experienced by bingers may relate to the stages of change and frequency of the behaviour.

Phenomenology of Binge Eating and Smoking

Beyond the decision making process and psychopathology, both binge eating and smoking can be identified through characteristics that are similar and unique to both behaviours. For instance, it has been demonstrated in the literature that prior to a binge episode, individuals with BN report a heightened level of negative affect (Davis, Freeman & Garner, 1988; Davis, Freeman & Solyom, 1985; Fairburn & Cooper, 1993). Occurrence of a similar emotional experience among individuals who binge eat in the absence of a disorder remains to be seen. As well, the affective experience of smokers in comparison to binge eaters warrants evaluation to determine whether the behaviours serve a similar function. Further

characteristics such as age of onset and frequency provide insight into the history of the behaviour and ability and motivation to change.

Purposes and Hypotheses of the Present Study

The main purpose of the present research was to examine the applicability of the stage construct and decisional balance to individuals who binge eat or smoke. For smoking, applying these constructs involved a replication of previous research (Prochaska, & DiClemente, 1983), while for binge eating, the pattern of results would help to determine whether the model can be extended to include this behaviour. It was predicted that individuals in different stages of change (precontemplation, contemplation, action, maintenance, and recovery) would exhibit different profiles on the decisional balance measure, with the relative weight assigned to the pros and cons of modifying the behaviour varying across the stages. Progression from precontemplation to action was expected to involve an increase in the pros of eliminating a behaviour and a decrease in the cons of eliminating the same behaviour. The profiles of decisional balance scores were assessed for differences between subjects with a history of either binge eating or smoking.

The second goal of the current study was to examine the psychological symptomatology exhibited across the various stages of behavioural change. It was predicted that the amount of psychological distress would vary according to stage of change. Based on the results of the study in which psychological symptoms decreased as a function of substance-free time (Sutherland, 1997), individuals identifying with the maintenance and recovery stages were predicted to report less psychological distress than those at earlier stages of change (i.e., precontemplation, contemplation, and action). Once again, similarities or differences between people with smoking or binge eating histories were explored.

The final goal was to explore the phenomenology of binge eating and smoking. Several exploratory measures were used to examine various characteristics of the behaviours such as the psychological experience, and historical factors such as age of onset and frequency. Comparisons were also made between binge eating and smoking in terms of the behavioural experience and as a function of the stages of change.

Method

Participants

Male and female participants were recruited through announcement and advertisement at Lakehead University (n = 21), Confederation College (n =34), the Thunder Bay Police Force (n = 34), a national-level judo competition (n = 20), and selected locations in the community (n = 84). Recruitment of participants involved poster advertisements and public presentations. Participants were read a description of the purposes and procedures of the study (Appendix A), and then asked to sign a consent form attesting to their voluntary, informed consent to participate (Appendix B). Participants then completed a one-page screening instrument designed to categorize participants according to the behaviour with which they self-identified; binge eating, smoking, or neither (Appendix C). Upon self-identifying with a behaviour, each participant completed a corresponding package of measures that required approximately 20 minutes of their time.

Measures

Screening Instrument for Behaviours (SIB). Participants completed a two-part series of questions designed to gather personal information. Part 1 consisted of several items related to gender, age, ethnic background, school affiliation, employment status, height and weight. The second part served as a screening instrument through which participants decided whether they

exhibited the behaviour according to the description provided (see Appendix C). Participants then completed one of two questionnaire packages depending on the behaviour they identified with, or a third package if they did not identify with the binge eating or smoking criteria. Control subjects completed only the Brief Symptom Inventory (BSI), providing a comparison group for the bingers and smokers. All measures were completed by bingers and smokers, with appropriate revisions made to reflect the respective behaviours.

Stage of Change Inventory (SCI). The SCI (Davis, 1996) is a self-report instrument that assesses current stage of change for a variety of eating disordered behaviours including binge eating. This instrument was adapted and used as the staging instrument for binge eaters and smokers in the present study. Stage of change was examined through the endorsement of statements reflecting the stage of change for each behaviour (see Appendix D1 and D2). Statements were rated along a five-point scale, with each representative of a different stage of change from precontemplation through recovery. The recovery stage applied to individuals who (a) used to engage in the behaviour, (b) felt they had overcome the problem, and (c)were confident that they would not return to the behaviour in the future.

University of Rhode Island Change Assessment Scale (URICA) Revised. Originally, lengthier staging questionnaires such as the URICA were developed for use with clients in outpatient psychotherapy (Prochaska & DiClemente, 1982). However, shorter, adapted instruments have been found to be as equally effective in staging subjects across a wide range of problem behaviours including smoking cessation (Dijkstra et al., 1996), opiate addiction (Tejero et al., 1997), weight control (Prochaska et al., 1992), and across 12 other problem behaviours including condom use, exercise acquisition, high fat diet, mammography screening, and adolescent delinquency (Prochaska, Velicer, et al., 1994). The shorter staging instruments

have the advantage of decreasing the amount of misclassification that often results from tied scores or incomplete scale scores. The longer URICA was used in the present study as a measure to establish concurrent validity for the SCI. Separate 40-item versions of the URICA were used to assess the stages of change for binge eating and smoking (see Appendix E1 and E2). A five-point likert format was used to score the items on each scale, with higher scores indicating greater agreement with the cognitions, attitudes and affect associated with each stage of change. Items on the binge eating version of the URICA were subjected to peer review and modified from the general form to more accurately reflect binge eating behaviour. In the case of tied scale scores, adjacent scale scores were evaluated and participants were assigned to the scale with the highest adjacent score. As this method of assignment is potentially problematic, the requirement of a simple, forced-choice staging instrument such as the SCI becomes more apparent.

Behaviour Characteristics of Binge Eating (BCBE) and Smoking (BCS). A two-part questionnaire was administered in two forms to participants in each group to assess specific characteristics of binge eating and smoking such as frequency and affective response to the behaviour (see Appendix F1and F2). Part I was used to gather information related to the duration over which the behaviour occurred, the age it began and the time span over which it was most frequent. Part II involved a set of statements reflecting various physical, and psychological characteristics related to either binge eating or smoking. Scales for each behaviour were created a priori based on the face validity of the items. For bingers, four scales were created to explore the behaviour in terms of volume of food, loss of control, affective experience and psychological function. Two scales were created for smokers to explore the affective experience and psychological function of smoking. Participants were required to

evaluate each statement for personal relevance along a five-point likert scale ranging from "never" to "always."

Decisional Balance for Binge Eating (DBBE) and Smoking (DBS). The decisional balance measure was originally designed to assess the decision-making component of the transtheoretical model. Two forms of the measure were modified from the decisional balance scale developed by Velicer et al. (1985) to assess and predict smoking status on the basis of the pros and cons of quitting. The 20-item self-report questionnaire evaluated 10 pros and 10 cons of smoking and binge eating in accordance with the measure developed by Velicer et al. (see Appendix G1 and G2). Potential items were subjected to peer review for content and applicability and were deemed to adequately reflect the behaviours in question. Participants rated each item for agreement along a five-point Likert scale, ranging from "not important at all" to "extremely important". Raw scores for the pros and cons were then converted to standard (T) scores with a mean of 50 and a standard deviation of 10. In a study of 12 problem behaviours, Prochaska, Velicer, et al. (1994) found a consistent pattern in the relative importance assigned to the pros and cons across the stages of change. Movement from precontemplation to action has been found to involve an increase in the pros of changing a behaviour, and a decrease in the cons; progressions referred to as the strong and weak principles, respectively (Prochaska, 1994). Internal consistencies were calculated for the pro and con scales for bingers and smokers in the present study.

Brief Symptom Inventory (BSI). The BSI (Derogatis, 1993) was administered as a measure of current psychological distress within the entire sample of self-identified binge eaters, smokers, and controls. (see Appendix H). A 5-point scale was used to rate each symptom in terms of distress the individual has experienced in the past 7 days, ranging from "not at all"

through "extremely." Scores on the BSI were calculated for the Global Severity Index (GSI), the nine primary symptom dimensions and additional items. Reliability investigations indicate that the BSI has an internal consistency (Cronbach's alpha) ranging from .71 on Psychoticism to .85 on the Depression dimension, based on a sample of 719 psychiatric outpatients (Nunnally, 1970). Test-retest coefficients ranged from .68 for Somatization to .91 for Phobic Anxiety for 60 nonpatients reassessed across a two-week interval (Nunnally).

Binge Eating Adjective Checklist (BEAC) and Smoking Adjective Checklist (SAC). This checklist was used to ascertain the feelings an individual experiences in relation to binge eating (Davis & Jamieson, 1999). A similar version of this checklist was adapted for use with smokers (SAC). The checklist contains 103 items. Participants were required to indicate the words that described the moods and feelings experienced immediately before or during an episode of binge eating or smoking (see Appendix I1 and I2). A composite score was calculated to reflect the overall negative psychological experience associated with the behaviour before and during the act.

Results

Characteristics of Participants

A total of 193 participants completed the questionnaire package. Two people were eliminated from the study for incomplete questionnaires. The remaining 191 participants were divided into 3 groups; controls (n = 64), bingers (n = 47) and smokers (n = 80). Table 1 provides the means and standard deviations of each group for the variables of gender, age, height, current weight and ideal weight. The groups were not significantly different on any of these variables.

Table 1

Characteristics of Participants

Variable		Group: Controls (n = 64)	Group: Bingers (n = 47)	Group: Smokers (n = 80)	Statistic	p
Gender: female	%	45	57	51	$\chi^2 = .05$	.83
Age (years)	M	34.4	32.9	37.5	F = 1.93	.15
	(SD)	(12.6)	(14.1)	(14.2)		
Height (inches)	M	68.0	66.8	67.1	F = 1.16	.31
	(SD)	(5.4)	(3.9)	(3.9)		
Current weight (pounds)	M	166.6	173.4	167.2	F = 0.65	.52
	(SD)	(34.0)	(41.1)	(29.7)		
Ideal weight (pounds)	M	154.8	157.0	155.5	F = 0.06	.94
	(SD)	(32.6)	(37.9)	(28.0)		

Note. F tests have dfs = (2, 188).

Internal Consistencies of Measures

Internal consistencies were calculated for the URICA scales, the Decisional Balance scales, and the Behavioural Characteristics (Part II) scales for bingers and smokers. The Cronbach's alpha coefficients for each 8-item URICA scale were as follows: (a) precontemplation (items 1, 5, 13, 15, 28, 32, 36, 38) $\alpha = .81$ for bingers and .65 for smokers; (b) contemplation (items 2, 4, 9, 14, 18, 23, 26, 29) $\alpha = .91$ for bingers and .90 for smokers; (c) action (items 3, 8, 11, 16, 21, 24, 31, 37) $\alpha = .93$ for bingers and .84 for smokers; (d) maintenance (items 6, 10, 19, 22, 27, 33, 35, 39) $\alpha = .87$ for bingers and .84 for smokers; and (e) recovery (items 7, 12, 17, 20, 25, 30, 34, 40) $\alpha = .94$ for bingers and .95 for smokers.

The Decisional Balance measure consisted of two 10-item scales. For the pro scale (all even-numbered items) $\alpha = .91$ for bingers and .84 for smokers. The con scale (all odd-numbered items) had reliability coefficients of $\alpha = .82$ for bingers and .85 for smokers.

Subscales for the behavioural characteristics measure were determined a priori for bingers and smokers. Internal consistencies for the four scales applicable to bingers were: (a) volume (items 6, 14, 15, 16) $\alpha = .81$; (b) control (items 7, 8, 9, 10, 11, 13) $\alpha = .90$; (c) affect (items 12, 17, 19, 20, 22, 23) $\alpha = .92$; and (d) function (items 18, 21) $\alpha = .65$. For smokers, the two subscales were found to have the following internal consistencies: (a) affect (items 6, 8, 9, 11, 12) $\alpha = .83$; and (b) function (items 7, 10) $\alpha = .76$.

Classification of Participants into Stages of Change

A cross-validation was performed between the URICA and the SCI. The single-item SCI correlated $r = .54$ ($p < .001$) with the URICA stage for bingers and $r = .84$ ($p < .001$) for

smokers. Table 2 displays the SCI staging assignment of bingers and smokers. For bingers, 47 participants identified with the criteria for binge eating and 45 were assigned to one of the stages of change. Two bingers did not complete the staging question and were treated as missing. Eighty participants identified themselves as present or past smokers and were assigned to a stage of change based on their SCI responses. The overall distribution of participants was bimodal, with a higher number of participants assigned to the contemplation and recovery stages.

Stages of Change and Decisional Balance

Separate one-way analyses of variance were conducted on the pro and con scale scores for bingers and smokers to determine whether the Decisional Balance scales differed across the stages of change. In order to control the familywise error rate, a Bonferroni correction was applied. The more conservative significance value was calculated at $p = .05/2 = .025$ for each scale.

For bingers, the raw means and standard deviations for the five stages of change and the two decisional balance scales are presented in Table 3. The pro scale was significant, $F(4, 38) = 6.05$, $p < .001$, as was the con scale, $F(4, 38) = 5.31$, $p < .01$, indicating differences in decisional balance scores across the stages of change. To determine exactly how the decisional balance scales differed across the stages, post hoc Student-Newman-Keuls tests were conducted. Amongst bingers, precontemplators scored significantly lower on the pro scale than action-takers and maintainers, while participants in recovery also scored lower than those in the action and maintenance stages. These results suggest that those individuals who are attempting to change or who have recently changed their behaviour place greater value on the benefits of changing compared to people in the other stages. A similar pattern emerged on the con scale, as

Table 2

Distribution of the Number (n) of Particpants According to Group and the Stage of Change Inventory (SCI)

SCI	Group	
	Bingers n	Smokers n
Precontemplation	13	3
Contemplation	12	33
Action	7	8
Maintenance	5	2
Recovery	8	34
Missing	2	-
Total	47	80

Table 3

Decisional Balance Scores as a Function of Stage of Change for Bingers

Decisional Balance		Stage of Change					F	p*
		Precontemplation	Contemplation	Action	Maintenance	Recovery		
Pro scale	n	13	12	7	5	8		
	M	10.38[a]	20.21	27.68[b]	23.20[b]	10.71[a]	6.05	.001
	(SD)	(8.45)	(10.58)	(5.70)	(7.16)	(10.53)		
Con scale	M	10.01[a]	17.08	22.71[b]	15.40	10.86[a]	5.31	.002
	(SD)	(4.95)	(7.32)	(6.47)	(3.05)	(9.12)		

Note. Groups with different superscripts are significantly different ($p < .05$) according to the Student-Newman-Keuls post hoc analysis. F tests have dfs = (4, 38).

*p was evaluated against the Bonferroni significance criterion of .025.

participants in the action stage were found to have significantly higher scores than those in precontemplation and recovery, suggesting that individuals in the throes of change are also more aware of the negative aspects of changing their behaviour.

Table 4 presents the findings for smokers, with significant results for both the pro scale, $F(4, 72) = 4.32$, $p < .01$ and the con scale, $F(4, 72) = 2.99$, $p < .025$. Student-Newman-Keuls testing revealed that precontemplators scored significantly lower on the pro scale than participants in the stages of contemplation, action, maintenance and recovery. These results suggest that precontemplators placed the least value on the positive aspects of changing their behaviour compared to individuals in any other stage of change. On the con scale, contemplators were found to score significantly higher than precontemplators, indicating a greater concern over the negative effects of behavioural change.

To place the current findings in the context of previous research (Prochaska, 1994; Prochaska, Velicer, et al., 1994), raw scores for the pro and con scales were converted to standardized T scores with $M = 50$ and $SD = 10$. Figure 1 depicts the standardized means for the pros and cons plotted as a function of stage of change for bingers. Movement from the precontemplation to action stage involved an increase of 1.60 SD on the pro scale. This finding is consistent with the strong principle of change (Prochaska, 1994). However, movement from precontemplation to action also involved an increase on the con scale of 1.65 SD. This finding is contrary to the decrease that was predicted by the weak principle of change. The relative emphasis placed on both the pros and cons of change was found to decrease from action through recovery.

Standardized means for the pros and cons according to stage of change for smokers are presented in Figure 2. The pros were found to increase by 2.55 SD from the precontemplation

Table 4

Decisional Balance Scores as a Function of Stage of Change for Smokers

Decisional balance		Stage of Change					F	p
		Precontemplation	Contemplation	Action	Maintenance	Recovery		
Pro scale	n	3	33	8	2	34		
	M	8.33[a]	23.49[b]	29.07[b]	19.50[b]	22.89[b]	4.32	.003
	(SD)	(9.29)	(6.58)	(4.78)	(2.12)	(8.77)		
Con scale	M	3.00[a]	18.55[b]	16.50	13.50	14.59	2.99	.024
	(SD)	(2.65)	(8.29)	(9.43)	(2.12)	(8.12)		

Note. Groups with different superscripts are significantly different ($p < .05$) according to the Student-Newman-Keuls post hoc analysis. F tests have dfs = (4, 72).

*p was evaluated against the Bonferroni significance criterion of .025.

Figure 1. Standardized T scores (M = 50, SD = 10) for the pro and con scales of the Decisional Balance measure plotted as a function of stage of change for bingers.

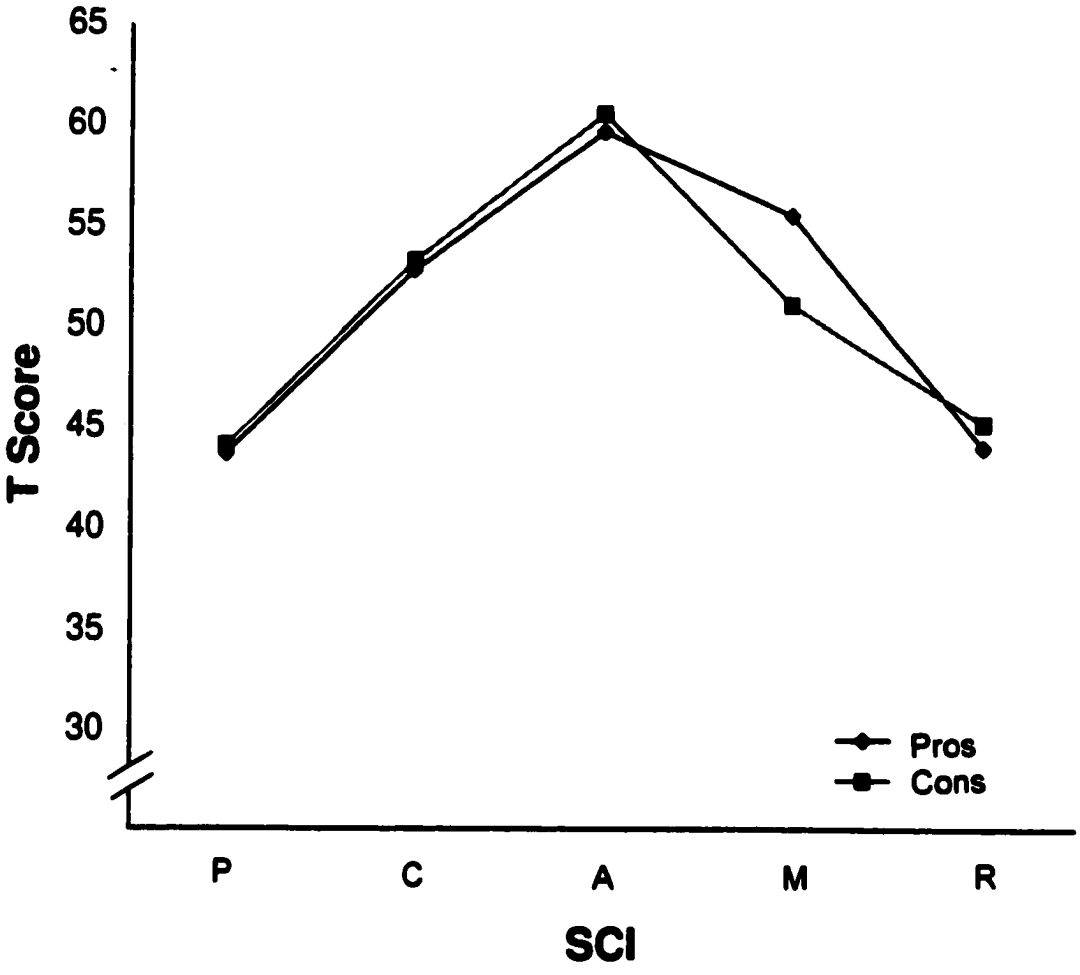
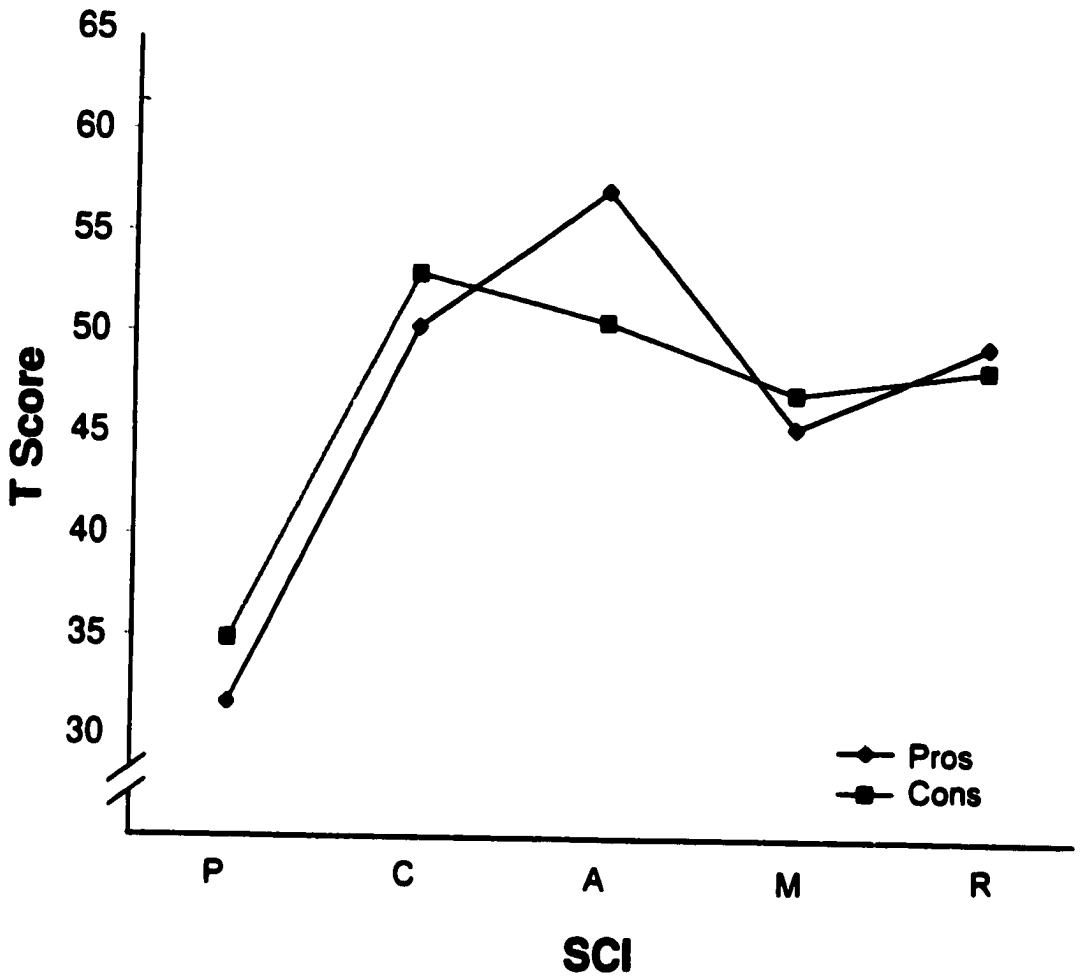


Figure 2. Standardized T scores (M = 50, SD = 10) for the pro and con scales of the Decisional Balance measure plotted as a function of stage of change for smokers.



to action stage. This result is consistent with the strong principle of change, although the magnitude of the change was even greater than predicted. For the con scale, movement from precontemplation to action involved an increase in the cons of 1.57 SD. An increase of 1.81 SD was found between precontemplation and contemplation, while a decrease of -.24 SD occurred between the contemplation and action stages. The overall increase that occurred on the con scale is contrary to the decrease that was predicted by the weak principle of change.

To summarize the results thus far, support was found for the strong principle of change for both bingers and smokers. The weak principle of change was not supported by the data for bingers or smokers. The cons were found to increase from the precontemplation to action stage. The relative importance placed on both the pros and cons of changing was found to significantly decrease from action through recovery for bingers, although this pattern was not replicated for smokers.

BSI Scores for Group and Stage of Change

A one-way analysis of variance was conducted to determine if controls, bingers, and smokers differed significantly on the BSI Global Severity Index (GSI). A significant difference was found between groups, $F(2, 187) = 4.66$, $p < .02$ (see Table 5). Post hoc comparisons using the Student-Newman–Keuls test revealed that bingers scored significantly higher than controls on the global measure of psychological distress.

The nine BSI subscales and the composite of four additional items were tested using a Bonferroni correction calculated as $\alpha = .05/10 = .005$. A significant difference was found between groups on the Hostility scale, $F(2, 185) = 5.87$, $p < .004$. The Student-Newman-Keuls test revealed that controls scored significantly lower than bingers and smokers on Hostility. A further difference was found between groups on the Somatization scale, $F(2, 185) = 7.40$, p

Table 5

Differences Between Groups on the Brief Symptom Inventory (BSI)

BSI scale		Group: Controls	Group: Bingers	Group: Smokers	F	p
Global Severity Index	M	.40[a]	.72[b]	.57	4.66	.011*
	(SD)	(.31)	(.56)	(.66)		
Additional items	M	.44	.84	.61	4.67	.011
	(SD)	(.43)	(.68)	(.82)		
Anxiety	M	.32	.54	.53	2.67	.072
	(SD)	(.39)	(.59)	(.70)		
Depression	M	.49	.84	.67	2.40	.093
	(SD)	(.58)	(.98)	(.95)		
Hostility	M	.43[a]	.89[b]	.74[b]	5.87	.003**
	(SD)	(.38)	(.79)	(.88)		
Interpersonal sensitivity	M	.65	1.01	.70	3.06	.049
	(SD)	(.62)	(.89)	(.85)		
Obsessive-compulsion	M	.68	.93	.76	1.74	.179
	(SD)	(.51)	(.70)	(.83)		

Table cont.

BSI scale score		Group: Controls	Group: Bingers	Group: Smokers	F	p
Phobic anxiety	M	.15	.37	.27	2.63	.075
	(SD)	(.30)	(.58)	(.62)		
Paranoid ideation	M	.35	.73	.58	4.22	.016
	(SD)	(.50)	(.76)	(.78)		
Psychoticism	M	.32	.55	.44	1.60	.204
	(SD)	(.48)	(.65)	(.77)		
Somatiziation	M	.29[a]	.78[b]	.57[b]	7.40	.001**
	(SD)	(.40)	(.75)	(.77)		

Note. Groups with different superscripts are significantly different ($p < .05$) according to the Student-Newman-Keuls post hoc analysis.

*p was evaluated against the significance criterion of .05.

**p was evaluated against the Bonferroni significance criterion of .005.

<.002, with controls scoring significantly lower than bingers and smokers. No significant differences were found between groups on the remaining seven scales or on the additional items.

Separate one-way analyses of variance were conducted to determine whether the GSI differed significantly as a function of stage of change for bingers and smokers. Table 6 presents GSI means and standard deviations as a function of stage of change and behaviour. GSI scores were not found to vary across the stages for bingers, $F(4, 39) = .86$, $p = .49$, or for smokers, $F(4, 74) = 1.46$, $p = .22$. A Bonferroni correction calculated at $\alpha = .05/10 = .005$ was applied to the 9 subscales and additional items of the BSI. The analyses of variance indicated that no significant differences were found on the BSI subscales for bingers or smokers across the stages of change.

Phenomenology of the Behaviours

Several exploratory measures were utilized to examine various aspects of binge eating and smoking behaviour. Areas of particular research interest included volume, control, function, and the psychological experiences associated with the behaviours. Additional historical characteristics were also examined such as frequency and age-related factors.

The BEAC was used to evaluate the psychological experience immediately before and while engaged in the behaviour for both bingers and smokers. A repeated-measures analysis of variance was conducted on the BEAC composite scores, with group as the between-subject effect (binger versus smoker) and time as the within-subject effect (before versus during). The main effect of group was significant, $F(1, 125) = 6.51$, $p < .05$, as was the main effect of time, $F(1, 125) = 38.04$, $p < .01$. The Group X Time interaction was not significant, $F(1, 125) = .00$, $p = .99$. Figure 3 depicts BEAC composite scores for bingers and smokers plotted as a function

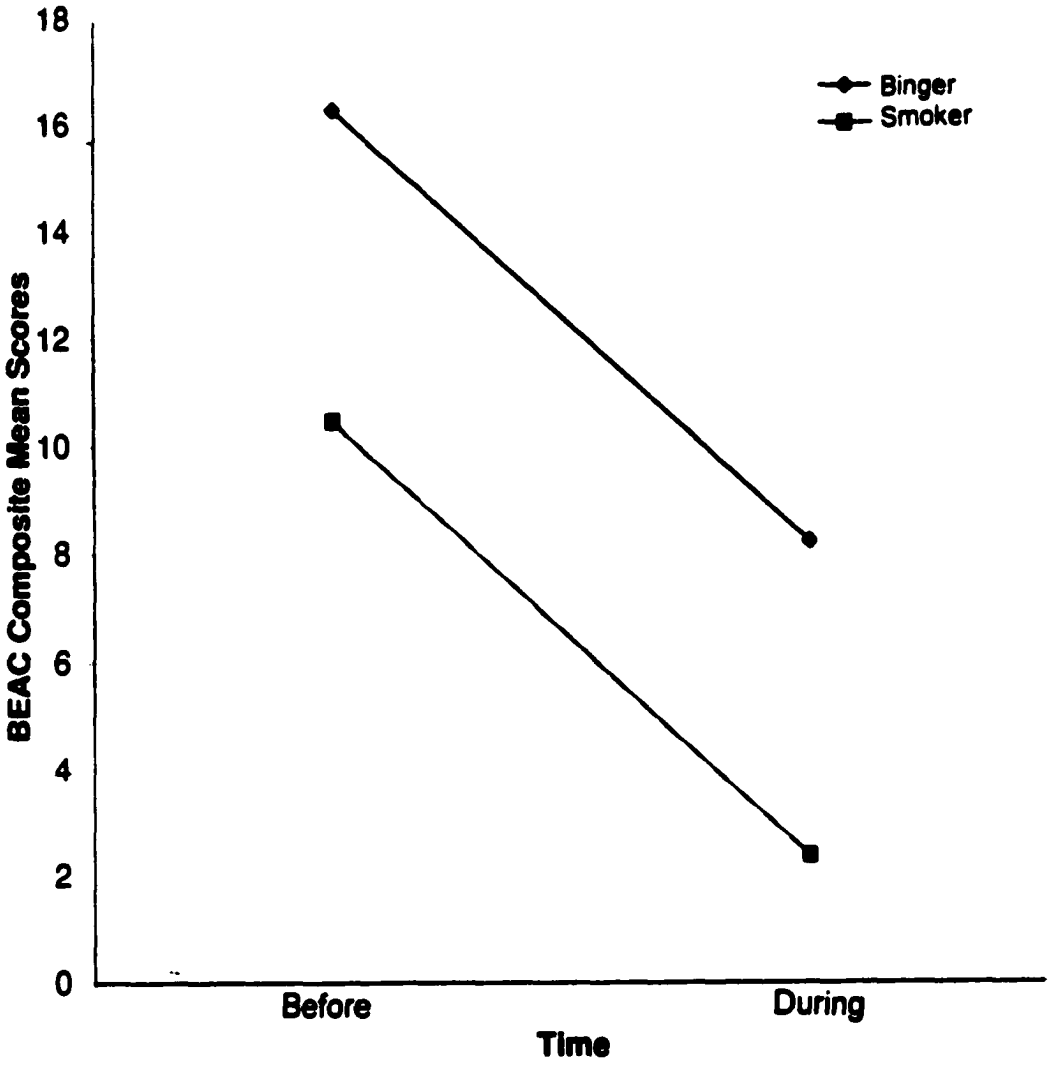
Table 6

Brief Symptom Inventory (BSI) Global Severity Index (GSI) as a Function of Stage of Change for Bingers and Smokers

BSI		Stage of Change					F	p
		Precontemplation	Contemplation	Action	Maintenance	Recovery		
				Bingers				
GSI	M	.61	.91	.78	.92	.53	.86	.49
	(SD)	(.54)	(.66)	(.24)	(.64)	(.61)		
				Smokers				
GSI	M	.36	.65	.97	.50	.41	1.46	.22
	(SD)	(.54)	(.67)	(.84)	(.60)	(.60)		

Note. dfs = (4, 39) for bingers and df = (4, 74) for smokers.

Figure 3. **Binge Eating Adjective Checklist composite scores for bingers and smokers plotted as a function of time.**



of time. Bingers reported a greater magnitude of negative affective and somatic experience compared to smokers. However, both groups reported significant reductions in these experiences when they were engaged in binge eating or smoking. These results suggest that for both bingers and smokers, the act of engaging in the behaviour serves a psychological function.

Additional features associated with binge eating and smoking were examined according to responses on the Behavioural Characteristics scales (Part II). Mean totals, standard deviations, and analysis of variance results are displayed in Table 7 for bingers. The binge-eating items comprised four scales evaluating control, negative affect, volume of food, and function. A Bonferroni criterion for significance was calculated at $\alpha = .05/4 = .0125$ for each test. A significant one-way analysis of variance found that bingers differed as a function of stage of change, $F(4, 39) = 7.04$, $p < .001$. A Student-Newman-Keuls test indicated that precontemplative bingers differed significantly from contemplators, action-takers, maintainers and recovered participants as they reported less loss of control than participants in all other stages.

The affect scale for bingers quantified the negative emotional experiences associated with binge eating. Significant differences were found between stages on the composite of items reflecting distress, disgust, depression, guilt and helplessness towards binge eating, $F(4, 39) = 7.04$, $p < .001$. Participants in precontemplation and recovery reported significantly lower associated affect compared to action-takers, and maintainers. Participants who have recently changed or are currently in the midst of changing their binge eating behaviour reported more negative affect in relation to binge eating than those in recovery and precontemplation.

Function and volume scale scores did not differentiate across the stages of change for bingers. Therefore, the positive function that binge eating serves such as pleasure and

Table 7

Behavioural Characteristics Scales (Part II) as a Function of Stage of Change for Bingers

Scale		SCI					F	p
		P	C	A	M	R		
	n	13	12	7	5	8		
Volume	M	8.00	11.17	10.29	11.20	9.63	1.58	.20
	(SD)	(3.11)	(3.46)	(2.29)	(3.20)	(4.81)		
Control	M	5.69[a]	14.33[b]	16.00[b]	14.60[b]	12.63[b]	7.40	.001*
	(SD)	(3.12)	(5.12)	(3.87)	(6.11)	(6.99)		
Affect	M	6.69[a]	12.83	19.00[b]	18.20[b]	10.25[a]	7.04	.001*
	(SD)	(5.12)	(6.21)	(3.56)	(5.26)	(7.55)		
Function	M	2.84	4.08	2.42	3.40	3.00	.81	.53
	(SD)	(1.72)	(2.71)	(2.30)	(1.52)	(2.27)		

Note. P = precontemplation, C = contemplation, A = action, M = maintenance, R = recovery. Groups with different superscripts are significantly different ($p < .05$) according to the Student-Newman-Keuls post hoc analysis.

*p was evaluated against the Bonferroni significance criterion of .0125.

relaxation was the same for participants in all stages of change. Further, the volume of food and rate of consumption did not differentiate among the stages. Thus, observed differences between the stages of change in loss of control and negative affect were not significantly related to the volume of food consumed.

Table 8 presents the means and standard deviations for smokers across the stages of change for the negative affect and function scales. No significant differences were found across the stages for either scale, using the Bonferroni correction of $\alpha = .05/2 = .025$. Thus, smokers reported consistent levels of negative affect and function, regardless of stage of change.

The Behavioural Characteristics questionnaire (Part I) examined the history of binge eating and smoking across the stages of change. Descriptive statistics for the items relating to age-related and frequency-related variables are displayed in Table 9 for bingers. Separate analyses were conducted with a Bonferroni criterion of $\alpha = .05/5 = .01$. One-way analyses of variance were conducted on the two age-related variables and no significant differences were found for bingers. Kruskal-Wallis analyses of variance were conducted on the three frequency variables as the existence of outliers resulted in a skewed distribution and violated the assumption of homogeneity of variance. Calculations based on median scores found that the current frequency of binges reported over the last 28 days differed significantly as a function of stage of change, $\chi^2(1) = 20.08$, $p = .0005$. As expected by definition of the stages of change, participants in maintenance and recovery reported a median frequency of 0 binges over the last 28 days. Contemplators reported the highest number of binges with a median frequency of 8. No significant differences were found between groups on the two maximum frequency-related variables.

Table 8

Behavioural Characteristics Scales (Part II) as a Function of Stage of Change for Smokers

		SCI						
Scale		P	C	A	M	R	F	p
	n	3	33	8	2	34		
Affect	M	3.67	7.94	10.75	8.00	6.38	2.45	.05
	(SD)	(4.62)	(4.58)	(3.77)	(1.41)	(4.05)		
Function	M	3.33	5.30	5.13	5.50	4.62	1.13	.35
	(SD)	(1.53)	(1.78)	(1.73)	(.71)	(2.10)		

Note. P = precontemplation, C = contemplation, A = action, M = maintenance, R = recovery.

*p was evaluated against the Bonferroni significance criterion of .025.

Table 9

Behavioural Characteristics (Part I) as a Function of Stage of Change for Bingers

Characteristic		SCI P	C	A	M	R	Statistic	p
Age at first episode	M (SD)	14.0 (3.2)	21.3 (15.8)	12.3 (1.6)	13.5 (3.0)	15.0 (2.5)	$F = 1.38$	.26
Age began regular episode	M (SD)	16.0 (4.7)	24.4 (15.7)	16.8 (4.2)	15.5 (2.4)	17.2 (3.2)	$F = 1.32$	.28
Current frequency over past 28 days	Mdn	3.0	8.0	2.0	.00	.00	$\chi^2 = 20.08$	.001*
Maximum frequency ever over 28 days	Mdn	3.0	10.0	12.0	15.0	7.5	$\chi^2 = 1.34$	.85
Months at maximum frequency	Mdn	12.0	9.0	21.0	4.0	12.0	$\chi^2 = 5.28$	.26

Note. P = precontemplation, C = contemplation, A = action, M = maintenance, R = recovery.

*p was evaluated against the Bonferroni significance criterion of .01.

For smokers, a significant difference was found on the current daily frequency item, $\chi^2(1) = 63.09$, $p < .0001$ (see Table 10). As expected, participants in recovery reported a median frequency of 0. However, caution should be taken in the interpretation of frequency totals for both the precontemplation and maintenance stages as a result of small cell sizes. For example, in the maintenance stage, one participant reported not smoking at all over the past 28 days, while the other reported smoking 20 cigarettes during this time, contrary to the staging definition for maintenance. Thus, the current median frequency was 10, above the expected frequency for self-identified maintainers. No significant differences were found between groups on the age-related and maximum frequency-related variables.

Summary of Findings

Decisional Balance as a function of stage of change. Partial support was found for Prediction 1, as the strong principle of change was evidenced for both bingers and smokers. Movement from precontemplation to action involved an increase greater than 1 SD for the pro scale. However, support was not found for the weak principle of change, as con scores actually increased from precontemplation to action, a finding opposite to that predicted.

Psychological distress as a function of stage of change. Support was not found for Prediction 2 as the index of distress did not decrease in the maintenance and recovery stages compared to the earlier stages of change. However, regardless of stage of change, group differences were found between controls, bingers, and smokers: (a) bingers scored higher than controls on the GSI, (b) bingers and smokers both scored higher than controls on the Hostility scale, and (c) bingers and smokers both scored higher than controls on the Somatization scale.

Phenomenology of the behaviours. The exploratory measures revealed the following about binge eating and smoking: (a) Both behaviours serve a psychological function in

Table 10

Behavioural Characteristics (Part I) as a Function of Stage of Change for Smokers

Characteristic		SCI P	SCI C	SCI A	SCI M	SCI R	Statistic	p
Age at first episode	M (SD)	13.7 (3.2)	15.1 (3.3)	12.5 (4.1)	13.5 (3.5)	15.0 (3.3)	$F = 1.17$	.33
Age began regular episode	M (SD)	16.0	17.4 (4.9)	15.3 (2.6)	19.0 (2.8)	17.1 (4.3)	$F = .49$	.75
Current frequency over past 28 days	Mdn	14.0	280.0	252.0	10.0	.00	$\chi^2 = 63.09$	.001*
Maximum frequency ever over 28 days	Mdn	56.0	331.0	406.0	700.0	420.0	$\chi^2 = 8.25$	.08
Months at maximum frequency	Mdn	6.0	21.0	12.0	139.5	120.0	$\chi^2 = 11.32$	.023

Note. P = precontemplation, C = contemplation, A = action, M = maintenance, R = recovery.

*p was evaluated against the Bonferroni significance criterion of .01.

decreasing the level of affective and somatic distress. (b) Bingers in the precontemplative stage experience less loss of control and negative affect than bingers in the other stages of change. (c) Bingers in the midst of change (i.e., action) report the greatest loss of control and negative affect associated with binge eating. (d) As expected, current behavioural frequency over the last 28 days differed as a function of stage of change for both bingers and smokers.

Discussion

Several limitations of the present study must be noted. The small sample size calls for caution to be exercised in the interpretation of the results. This problem is particularly evident in the smoking sample where the precontemplation and maintenance stages have very small numbers. An additional limitation exists in the use of the staging instrument for bingers and smokers. Difficulties noted with the URICA such as tied and missing scale scores has led to the creation of shorter staging algorithms such as the SCI. However, in the present study, the SCI was not entirely accurate and resulted in a false-positive misclassification for 1 out of 80 smokers. Although the SCI has good concurrent validity with the URICA, there is a lack of collateral or biological measures with which to further validate the instrument. Lastly, binge eating may be more difficult to classify into distinct stages than other problem behaviours as binge eating is dependent upon an individual's subjective perception of food consumption versus complete abstinence from a behaviour such as smoking.

In spite of the limitations discussed, the results of the study tend to support the utility of the stages of change model and decisional balance for bingers and smokers. For both behaviours, the pros of changing the behaviour were found to increase one or more standard deviations from precontemplation through action, as predicted by the strong principle of change. For bingers and smokers, the total con score was also found to increase from

precontemplation through action contrary to the weak principle. For bingers, the con scale continuously increased through the action stage, while for smokers an increase occurred from precontemplation to contemplation, followed by a decrease towards action. For smokers, the lack of support for the weak principle of change may be a reflection of the very small number of participants in the action stage. An alternative explanation may be that participants were misclassified in some cases, although similar results were found on the pro and con scores when the URICA was used to stage participants. For both behaviours, the pro and con scores decreased from action towards recovery, a pattern consistent with previous findings (Dijkstra et al., 1996; Velicer et al., 1985). For bingers and smokers, the action stage appears to be the critical stage in the decision-making process: Participants in this stage evidence the greatest awareness of the pros and cons for changing their behaviour. The decrease in these scores towards recovery suggests that once the decision to change has been made, the reasons motivating the change decrease in importance. Further, participants in the precontemplation stage do not acknowledge their behaviour as a problem as evidenced by the low pro and con scale scores. These results are entirely consistent with the attitudes and beliefs characteristic of this stage of change.

For bingers specifically, the results of the staging approach and decisional balance are of particular interest because the model has not previously been applied to a non-clinical binge eating sample. The heightened pro and con scores in the action stage correspond with an increase in the negative affect and loss of control scales that was also found in this study. These findings suggest that participants in the throes of changing their binge eating are most aware of both the negative and positive consequences and also experience the greatest negative affect and loss of control regarding their behaviour. The effort required to change may be greatest at

this stage as the individual is confronted with the consequences of changing their behaviour thereby contributing to the loss of control and negative affect characteristic of this stage.

The amount of psychological distress experienced by bingers and smokers did not differentiate between the stages of change as predicted. Based on addictions research with a drug and alcohol abusing sample (Sutherland, 1997), participants in the maintenance and recovery stages were predicted to exhibit less psychological symptomatology than the other stages of change as a function of the amount of substance free time. Results of the study were not in support of this prediction. The lack of support may again be attributed to the previously discussed limitations, as it was found that one self-identifying maintainer had smoked at a frequency comparable to participants in the other stages of change over the last 28 days. Therefore, the level of psychological distress experienced as a function of substance free time cannot be evaluated in this situation. However, differences were found between bingers, smokers and controls on the measures of psychological distress regardless of stage of change. Bingers were found to experience more distress than smokers and controls as indicated on the Global Severity Index of the Brief Symptom Inventory. This finding is consistent with previous research indicating a positive relationship between binge eating severity and psychological functioning (Fairburn et al., 1998; Marcus et al., 1988; Spitzer et al., 1993). Further differences emerged between the groups on the Hostility and Somatization scales. Control subjects were found to exhibit less psychological distress than either bingers or smokers. However, causality cannot be determined in the relationship between problem behaviours and psychological functioning. Significantly, it cannot be determined whether engaging in the problem behaviour leads to psychological distress or whether the level of distress experienced causes someone to

engage in the behaviour. Further questions remain regarding the causal relationship across the stages of change and in relation to different frequencies and severity of the behaviour.

Regarding the phenomenology of binge eating and smoking, several interesting findings emerged through the use of the exploratory measures. In accordance with the literature on eating disorders, bingers and smokers reported a higher level of negative affect prior to engaging in the behaviour (Davis et al., 1985). Therefore, a psychological function is served by engaging in either binge eating or smoking as determined through the BEAC and SAC composite scores. Binge eating appears to have greater psychological consequences than smoking regardless of stage of change.

For bingers, the amount of loss of control and negative affect experienced in relation to a binge eating episode was found to vary across the stages of change. Precontemplative bingers reported experiencing more control and less negative affect regarding their binge eating than did individuals in any of the other stages. However, these individuals were binge eating with a comparable frequency and volume as the other bingers. Therefore, the psychological impact of binge eating for precontemplators is much less than the other stages. It is difficult to determine whether binge eating is less problematic for precontemplative bingers or whether they are denying the existence of a problem and inflating their sense of control over the experience. However, the lack of significant differences on volume and frequency scales suggests that these individuals are minimizing or denying the existence of a problem behaviour. A similar pattern of responses was found by DiClemente and Hughes (1990) in a study of alcoholic outpatients. In that study, precontemplative alcoholics consumed a comparable quantity of alcohol as the other stages although they reported a lower level of loss of control, deterioration and alcoholism. Thus, it appears that across behaviours, the precontemplation stage of change is

unique in that these individuals engage in the same behaviour as others although they are either psychologically resistant to the experience or minimize the psychological consequences.

In contrast, bingers in the action stage were not binge eating any more frequently than the other stages although they reported the greatest amount of negative affect and loss of control. Further, these individuals scored significantly higher than the others on both decisional balance measures. Therefore, for individuals in the midst of change, both the positive and negative consequences of their behaviour are emphasized and they experience the most distress in relation to their binge eating. Once again, the issue of causality can be raised in this situation: Either action-takers are moved to change their behaviour because of the amount of psychological distress caused by their binge eating, or the process of changing their binge eating behaviour impacts negatively on their psychological functioning.

Interestingly, individuals in maintenance and recovery report similar levels of loss of control as contemplators and action-takers when reflecting on their past behaviour. However, maintainers report a significantly higher amount of negative affect than those in recovery. For those in the maintenance stage, the persistent concern and effort required to prevent a relapse may maintain the negative affect associated with their previous behaviour. In comparison, individuals who consider themselves recovered from binge eating hold a less negative view of their previous behaviour. Therefore, the negative affect experienced by past bingers may be attributed to the present level of concern and confidence related to maintaining the behavioural change. This distinction in negative affect provides support for the inclusion of a stage beyond maintenance as the two stages are characteristically different. Additionally, recovered binge eaters report significantly fewer pros of changing their behaviour than maintainers.

While the results of this study support the extension of the transtheoretical model and decisional balance to binge eating, further exploration is certainly warranted. A longitudinal study is required to determine the influence of the pros and cons of quitting and psychological distress on movement through the stages of change. Inclusion of an additional source of validation for the staging instrument would be beneficial in reducing the misclassification of participants. For smokers, a test for nicotine dependence may provide an additional source of information and for bingers a food diary might prove fruitful. As well, for binge eating participants, a measure should be included to assess compensatory behaviours such as vomiting and/or laxative usage. Within the present study, it is possible that some of the bingers may be engaging in compensatory behaviours, indicating a disorder of a more serious pathological origin. Identifying these individuals may provide a further understanding of binge eating in the presence and absence of an eating disorder. Questions regarding relapse and the number of attempts at change may be useful in further understanding the change process among binge eaters. Lastly, including an opportunity for participants to provide an explanation of any intervention strategies they may have relied upon such as the nicotine patch for smokers may provide additional information regarding movement towards recovery.

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Appendix A

Cover Letter

Dear Participant:

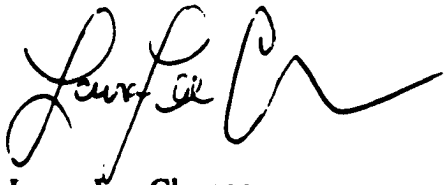
I am conducting a study on the attitudes, beliefs, and feelings that individuals have regarding binge eating and smoking.

The purpose of this study is to investigate the relationship between the occurrence of specific behaviours and personal attitudes and feelings about those behaviours. Your participation in this research will help to shed light on the connection between behaviour and attitudes.

All information gathered will remain confidential and securely stored for a period of seven years at Lakehead University. The general results of the study will be made available to you at your request upon completion of the study.

Thank you for you cooperation.

Sincerely,



Laura-Lee Clausen

Appendix B

Consent Form

My signature on this form indicates that I agree to participate in a study on BEHAVIOURAL ATTITUDES being conducted by Laura-Lee Clausen. I understand the following:

1. I am a volunteer and can withdraw at any time from the study.
2. There is no risk of physical or psychological harm.
3. The information I provide will be confidential and stored for a period of seven years.
4. I will receive a summary of the study, upon request, following the completion of the study.

I have received explanations about the nature of the study, its purpose, and procedures. If I have any questions about the study after my participation, I may directly contact Laura-Lee Clausen (researcher) or Dr. Ron Davis (supervisor) in the Dept. of Psychology, Lakehead University, phone 343-8441.

Signature of Participant Date

Print Name

Appendix C

SIB

PART 1

Please complete the following questions.

Age: ____yrs

Gender (check one): _____ female, _____ male

Check one: ____ college student, ____ university student, ____ employed full or part-time, ____ other

Ethnic Background: _____

Height: ___ft. ___ inches (guess if you don't know)

Current Weight: _____ lbs (guess if you don't know)

Desired Weight: _____lbs

PART 2

Please respond as honestly as possible to the following questions by circling your response.

1. Has there ever been a period of time in your life when you engaged in binge eating? An episode of binge eating is characterized by eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances.

   (a) = yes If **YES**, please continue by completing **Answer Package #1** (skip questions 2 and 3)

   (b) = no If **NO**, please continue with **item #2.**

2. Has there ever been a period of time when you engaged in smoking cigarettes?

   (a) = yes If **YES**, please continue by completing **Answer Package #2** (skip question #3).
   (b) = no If **NO**, please continue with **item #3.**

3. If there has never been a period of time when you have engaged in either binge eating or smoking as described above please continue by completing **Answer Package #3.**

Appendix D1

SCI for Binge Eating

Instructions:

1. Read all of the statements within the box below.
2. Choose the letter beside the one statement that best describes you.
3. Circle this letter.

Some people binge eat: characterized by eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances.

a) I have binged within the past 3 months but I am not concerned about it. I just don't see it as a personal problem.

b) I have binged within the past 3 months and it concerns me. I would like to stop binge eating but I really haven't done anything about it so far.

c) I have binged within the past 3 months and it concerns me. I am really trying hard to stop binge eating but sometimes I still have this problem.

d) I used to binge but I have completely stopped within the past 3 or more months. I am concerned that I could start binge eating again if I am not careful.

e) I used to binge but I have completely stopped within the past 3 or more months. I believe that I have overcome this problem and I am confident that I will not start doing it again in the future.

Appendix D2

SCI for Smoking

Instructions:

1. Read all of the statements within the box.
2. Choose the letter beside the one statement that best describes you.
3. Circle this letter.

Some people smoke: a period of time in their lives when they engage in smoking cigarettes. Select the following statement that best describes you.

a) I have smoked within the past 3 months but I am not concerned about it. I just don't see it as a personal problem.

b) I have smoked within the past 3 months and it concerns me. I would like to stop smoking but I really haven't done anything about it so far.

c) I have smoked within the past 3 months and it concerns me. I am really trying hard to stop smoking but sometimes I still have this problem.

d) I used to smoke but I have completely stopped within the past 3 or more months. I am concerned that I could start smoking again if I am not careful.

e) I used to smoke but I have completely stopped within the past 3 or more months. I believe that I have overcome this problem and I am confident that I will not start doing it again in the future.

Appendix E1

URICA Revised - BE

Instructions:

Each statement describes how a person might feel about his or her binge eating. Please indicate the extent to which you **AGREE** or **DISAGREE** with each statement. In each case, make your choice in terms of how you feel right now, not how you would like to feel. There are FIVE possible responses to each of the questionnaire items.

Please indicate the letter that best describes how much you agree or disagree with each statement by circling that letter on the page.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. As far as I am concerned, I do not have any problems with binge eating that need changing.	a)	b)	c)	d)	e)
2. I think I may be ready for some self-improvement in my binge eating.	a)	b)	c)	d)	e)
3. I am doing something about my binge eating that has been bothering me.	a)	b)	c)	d)	e)
4. It might be worthwhile for me to work on my binge eating.	a)	b)	c)	d)	e)
5. I do not have a problem with binge eating. It doesn't make much sense for me to answer these questions.	a)	b)	c)	d)	e)
6. It worries me that I may slip back into binge eating like I used to, so I am ready to work on it.	a)	b)	c)	d)	e)
7. I used to binge eat, have stopped, and it no longer concerns me.	a)	b)	c)	d)	e)
8. I am finally doing some work to control my binge eating.	a)	b)	c)	d)	e)
9. I have been thinking that I may want to stop binge eating.	a)	b)	c)	d)	e)
10. I have been successful in controlling my binge eating but I am not sure I can continue.	a)	b)	c)	d)	e)
11. At times, my binge eating is a difficult problem, but I am working on it.	a)	b)	c)	d)	e)
12. I have been successful in stopping my binge eating and I no longer think about it.	a)	b)	c)	d)	e)
13. Working on my binge eating is pretty much a waste of time for me because it does not have anything to do with me.	a)	b)	c)	d)	e)

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
14. I am working on my binge eating in order to feel better about myself.	a)	b)	c)	d)	e)
15. I guess I do binge eat, but it is nothing that I really need to change.	a)	b)	c)	d)	e)
16. I am really working hard to stop binge eating.	a)	b)	c)	d)	e)
17. I used to have to try really hard not to binge eat, but now I don't even have to think about it.	a)	b)	c)	d)	e)
18. I have a problem with binge eating and I really think I should work on it.	a)	b)	c)	d)	e)
19. I am not following through on the changes I have already made as well as I had hoped, and I am not working to prevent myself from binge eating.	a)	b)	c)	d)	e)
20. I am no longer even tempted to binge eat now that I have stopped.	a)	b)	c)	d)	e)
21. Even though I am not always successful in changing, I am at least working on my binge eating.	a)	b)	c)	d)	e)
22. I thought once that I had resolved my problem with binge eating, I would be free of it, but sometimes I still find myself struggling with it.	a)	b)	c)	d)	e)
23. I wish I had more ideas on how to stop binge eating.	a)	b)	c)	d)	e)
24. I have started to work on my binge eating but I would like some help.	a)	b)	c)	d)	e)
25. Binge eating is something I consider to be part of my past.	a)	b)	c)	d)	e)
26. Maybe someone will be able to help me with my binge eating.	a)	b)	c)	d)	e)
27. I may need a boost right now to help me maintain the changes I have already made in my binge eating.	a)	b)	c)	d)	e)
28. I may be a part of my binge eating problem, but I do not really think that I am.	a)	b)	c)	d)	e)
29. I hope that someone will have some good advice for me about binge eating.	a)	b)	c)	d)	e)
30. Binge eating used to trouble me, but now that I have stopped I no longer worry about it.	a)	b)	c)	d)	e)
31. Anyone can talk about changing their binge eating; I'm actually doing something about it.	a)	b)	c)	d)	e)

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
32. All this talk about psychology is boring. Why can't people just forget their binge eating?	a)	b)	c)	d)	e)
33. I am working to prevent myself from having a relapse of binge eating.	a)	b)	c)	d)	e)
34. Since I have stopped binge eating, I am no longer concerned that I could start doing it again.	a)	b)	c)	d)	e)
35. It is frustrating, but I feel I might be having a recurrence of the binge eating problem I thought I had resolved.	a)	b)	c)	d)	e)
36. I have worries about my binge eating, but so does the next person. Why spend time thinking about it?	a)	b)	c)	d)	e)
37. I am actively working on my binge eating problem.	a)	b)	c)	d)	e)
38. I would rather cope with my binge eating than try to change it.	a)	b)	c)	d)	e)
39. After all that I have done to stop binge eating, every now and then it comes back to haunt me.	a)	b)	c)	d)	e)
40. I would say that I am "cured" of my binge eating.	a)	b)	c)	d)	e)

Appendix E2

URICA Revised - S

Instructions:

Each statement describes how a person might feel about his or her smoking. Please indicate the extent to which you **AGREE** or **DISAGREE** with each statement. In each case, make your choice in terms of how you feel right now, not how you would like to feel. There are FIVE possible responses to each of the questionnaire items.

Please indicate the letter that best describes how much you agree or disagree with each statement by circling that letter on the page.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. As far as I am concerned, I do not have any problems with smoking that need changing.	a)	b)	c)	d)	e)
2. I think I may be ready for some self-improvement with my smoking.	a)	b)	c)	d)	e)
3. I am doing something about my smoking that has been bothering me.	a)	b)	c)	d)	e)
4. It might be worthwhile for me to work on smoking.	a)	b)	c)	d)	e)
5. I do not have a problem with smoking. It doesn't make much sense for me to answer these questions.	a)	b)	c)	d)	e)
6. It worries me that I may slip back into smoking like I used to, so I am ready to work on it.	a)	b)	c)	d)	e)
7. I used to smoke, have stopped, and it no longer concerns me.	a)	b)	c)	d)	e)
8. I am finally doing some work to control my smoking.	a)	b)	c)	d)	e)
9. I have been thinking that I may want to quit smoking.	a)	b)	c)	d)	e)
10. I have been successful in controlling my smoking but I am not sure I can continue.	a)	b)	c)	d)	e)
11. At times, my smoking is a difficult problem, but I am working on it.	a)	b)	c)	d)	e)
12. I have been successful in quitting smoking and I no longer think about it.	a)	b)	c)	d)	e)
13. Working on my smoking is pretty much a waste of time for me because it does not have anything to do with me.	a)	b)	c)	d)	e)

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
14. I am working on my smoking in order to feel better about myself.	a)	b)	c)	d)	e)
15. I guess I do smoke, but it is nothing that I really need to change.	a)	b)	c)	d)	e)
16. I am really working hard to quit smoking.	a)	b)	c)	d)	e)
17. I used to have to try really hard not to smoke, but now I don't even have to think about it.	a)	b)	c)	d)	e)
18. I have a problem with smoking and I really think I should work on it.	a)	b)	c)	d)	e)
19. I am not following through on the changes I have already made as well as I had hoped, and I am not working to prevent myself from smoking.	a)	b)	c)	d)	e)
20. I am no longer even tempted to smoke now that I have stopped.	a)	b)	c)	d)	e)
21. Even though I am not always successful in changing, I am at least working on my smoking.	a)	b)	c)	d)	e)
22. I thought once that I had resolved my problem with smoking, I would be free of it, but sometimes I still find myself struggling with it.	a)	b)	c)	d)	e)
23. I wish I had more ideas on how to stop smoking.	a)	b)	c)	d)	e)
24. I have started to work on my smoking but I would like some help.	a)	b)	c)	d)	e)
25. Smoking is something I consider to be part of my past.	a)	b)	c)	d)	e)
26. Maybe someone will be able to help me with my smoking.	a)	b)	c)	d)	e)
27. I may need a boost right now to help me maintain the changes I have already made in my smoking.	a)	b)	c)	d)	e)
28. I may be a part of my smoking problem, but I do not really think that I am.	a)	b)	c)	d)	e)
29. I hope that someone will have some good advice for me about smoking.	a)	b)	c)	d)	e)
30. Smoking used to trouble me, but now that I have stopped I no longer worry about it.	a)	b)	c)	d)	e)

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
31. Anyone can talk about changing their smoking; I'm actually doing something about it.	a)	b)	c)	d)	e)
32. All this talk about psychology is boring. Why can't people just forget their smoking?	a)	b)	c)	d)	e)
33. I am working to prevent myself from having a relapse of smoking.	a)	b)	c)	d)	e)
34. Since I have stopped smoking, I am no longer concerned that I could start doing it again.	a)	b)	c)	d)	e)
35. It is frustrating, but I feel I might be having a recurrence of the smoking problem I thought I had resolved.	a)	b)	c)	d)	e)
36. I have worries about my smoking, but so does the next person. Why spend time thinking about it?	a)	b)	c)	d)	e)
37. I am actively working on my smoking problem.	a)	b)	c)	d)	e)
38. I would rather cope with my smoking than try to change it.	a)	b)	c)	d)	e)
39. After all that I have done to stop smoking, every now and then it comes back to haunt me.	a)	b)	c)	d)	e)
40. I would say that I am "cured" of my smoking.	a)	b)	c)	d)	e)

Appendix F1

BCBE

PART I

Instructions:

1. Please remember in answering the following questions that an eating binge *only* refers to an episode characterized by eating, in a discrete period of time (e.g. within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances.

2. For each of the following items, please provide your best estimate in the space provided.

1. How old were you when you *first* had an eating binge? _____ years old

2. How old were you when you began binge eating on a *regular* basis? _____ years old

3. During the ***last three months***, how often have you typically had an eating binge? (check one item only and fill in corresponding frequency)

   ___Daily - I usually binge ___ time(s) a day.
   ___Weekly - I usually binge ___ time(s) a week.
   ___Monthly - I usually binge ___ time(s) a month.
   ___ I have not binged in the last three months.

4. During the ***most frequent of times in your life***, how often did you typically have an eating binge?

   ___Daily - I would usually binge ___ time(s) a day.
   ___Weekly - I would usually binge ___ time(s) a week.
   ___Monthly - I would usually binge ___ time(s) a month.

5. For how many months were you bingeing this frequently? _____months

PART II

Instructions:

1. Please read the statements below and indicate how characteristic each item is/was of your binge eating behaviour.

2. Circle the letter beside each statement that best reflects your answer.

	Never	Rarely	Sometimes	Often	Always
6. I would consume an unusually large amount of food during a binge	a)	b)	c)	d)	e)
7. I would feel out of control when I binge	a)	b)	c)	d)	e)
8. I would feel that I could not stop eating once a binge started	a)	b)	c)	d)	e)
9. I would feel that I could not prevent a binge from starting in the first place	a)	b)	c)	d)	e)
10. I would feel that I could not control my urges to eat large quantities of food	a)	b)	c)	d)	e)
11. I would eat large amounts of food when not feeling physically hungry	a)	b)	c)	d)	e)
12. I would eat alone because of being embarrassed by how much I would binge upon	a)	b)	c)	d)	e)
13. I would feel that I could not control what type of food I binge upon	a)	b)	c)	d)	e)
14. I would feel that I could not control how much food I would binge upon	a)	b)	c)	d)	e)
15. I would eat much more rapidly during a binge than normal	a)	b)	c)	d)	e)
16. I would eat until feeling uncomfortably full	a)	b)	c)	d)	e)

	Never	Rarely	Sometimes	Often	Always
17. I would feel distressed by my bingeing	a)	b)	c)	d)	e)
18. I would find bingeing pleasurable	a)	b)	c)	d)	e)
19. I would feel disgusted about my bingeing	a)	b)	c)	d)	e)
20. I would feel depressed about my bingeing	a)	b)	c)	d)	e)
21. I would find bingeing relaxing	a)	b)	c)	d)	e)
22. I would feel guilty about my bingeing	a)	b)	c)	d)	e)
23. I would feel helpless about my bingeing	a)	b)	c)	d)	e)

Appendix F2

BCS

PART I

Instructions:

1. Please remember in answering the following questions that smoking refers to a period of time in which you engaged in smoking cigarettes.

2. For each of the following items, please provide your best estimate in the space provided.

1. How old were you when you *first* began smoking? _____ years old

2. How old were you when you began smoking on a *regular* basis? _____ years old

3. During the ***last three months***, how often have you typically smoked?
(check one item only and fill in corresponding frequency)

___Daily - I usually smoke ___ time(s) a day.
___Weekly - I usually smoke ___ time(s) a week.
___Monthly - I usually smoke ___ time(s) a month.
___ I have not smoked in the last three months.

4. During the ***most frequent of times***, how often did you typically smoke?

___Daily - I would usually smoke ___ time(s) a day.
___Weekly - I would usually smoke ___ time(s) a week.
___Monthly - I would usually smoke ___ time(s) a month.

5. For how many months were you smoking this frequently? _____months

PART II

Instructions:

1. Please read the statements below and indicate how characteristic each item is/was of your smoking
2. Circle the letter beside each statement that best reflects your answer.

	Never	Rarely	Sometimes	Often	Always
6. I would feel distressed by my smoking	a)	b)	c)	d)	e)
7. I would find smoking pleasurable	a)	b)	c)	d)	e)
8. I would feel disgusted about my smoking	a)	b)	c)	d)	e)
9. I would feel depressed about my smoking	a)	b)	c)	d)	e)
10. I would find smoking relaxing	a)	b)	c)	d)	e)
11. I would feel guilty about my smoking	a)	b)	c)	d)	e)
12. I would feel helpless about my smoking	a)	b)	c)	d)	e)

Appendix G1

DBBE

Instructions:

The following statements represent different opinions about binge eating. Please rate **HOW IMPORTANT** each statement would be to you if you were deciding whether or not to binge eat. Circle your response to each question on the page.

	Not Important at All	Slightly Important	Moderately Important	Very Important	Extremely Important
1. The effort needed for me to stop binge eating would be far too much.	a)	b)	c)	d)	e)
2. I would feel more optimistic if I stopped binge eating.	a)	b)	c)	d)	e)
3. I would be less productive.	a)	b)	c)	d)	e)
4. I would feel better about myself if I stopped binge eating.	a)	b)	c)	d)	e)
5. Binge eating makes me feel better for a period of time.	a)	b)	c)	d)	e)
6. My self-respect would be greater if I stopped binge eating.	a)	b)	c)	d)	e)
7. I think I would be more moody towards others if I stopped binge eating.	a)	b)	c)	d)	e)
8. My family would be proud of me if I stopped binge eating.	a)	b)	c)	d)	e)
9. I would no longer be able to "binge out" when upset.	a)	b)	c)	d)	e)
10. I would be happier if I stopped binge eating.	a)	b)	c)	d)	e)
11. I am concerned I might fail if I try to change.	a)	b)	c)	d)	e)
12. Others would have more respect for me if I stopped binge eating.	a)	b)	c)	d)	e)
13. Binge eating helps me to relieve tension.	a)	b)	c)	d)	e)
14. I would worry less if I quit binge eating.	a)	b)	c)	d)	e)
15. By continuing to binge eat I am making my own decisions.	a)	b)	c)	d)	e)
16. I am embarrassed about my binge eating and wouldn't have to feel this way if I could stop.	a)	b)	c)	d)	e)
17. Binge eating provides me some sort of "comfort" when I need it.	a)	b)	c)	d)	e)
18. I could save money if I didn't binge eat.	a)	b)	c)	d)	e)
19. Binge eating serves some function in my life.	a)	b)	c)	d)	e)
20. I would be healthier if I stopped binge eating.	a)	b)	c)	d)	e)

Appendix G2

DBS

Instructions:

The following statements represent different opinions about smoking. Please rate **HOW IMPORTANT** each statement would be to you if you were deciding whether or not to smoke cigarettes. Circle your response to each question on the page.

	Not Important at All	Slightly Important	Moderately Important	Very Important	Extremely Important
1. The effort needed for me to stop smoking would be far too much.	a)	b)	c)	d)	e)
2. I would feel more optimistic if I stopped smoking.	a)	b)	c)	d)	e)
3. I would be less productive.	a)	b)	c)	d)	e)
4. I would feel better about myself if I stopped smoking.	a)	b)	c)	d)	e)
5. Smoking makes me feel better for a period of time.	a)	b)	c)	d)	e)
6. My self-respect would be greater if I stopped smoking.	a)	b)	c)	d)	e)
7. I think I would be more moody towards others if I stopped smoking.	a)	b)	c)	d)	e)
8. My family would be proud of me if I stopped smoking.	a)	b)	c)	d)	e)
9. I would no longer be able to smoke when upset.	a)	b)	c)	d)	e)
10. I would be happier if I stopped smoking.	a)	b)	c)	d)	e)
11. I am concerned I might fail if I try to change.	a)	b)	c)	d)	e)
12. Others would have more respect for me if I stopped smoking.	a)	b)	c)	d)	e)
13. Smoking helps me to relieve tension.	a)	b)	c)	d)	e)
14. I would worry less if I quit smoking.	a)	b)	c)	d)	e)
15. By continuing to smoke I am making my own decisions.	a)	b)	c)	d)	e)
16. I am embarrassed about my smoking and wouldn't have to feel this way if I could stop.	a)	b)	c)	d)	e)
17. Smoking provides me some sort of "comfort" when I need it.	a)	b)	c)	d)	e)
18. I could save money if I didn't smoke.	a)	b)	c)	d)	e)
19. Smoking serves some function in my life.	a)	b)	c)	d)	e)
20. I would be healthier if I stopped smoking.	a)	b)	c)	d)	e)

Appendix H

BSI

Instructions:

Below is a list of problems people sometimes have. Please read each one carefully, and indicate the response that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY.

Record only one response for each problem and do not skip any items. Circle your response on the page.

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

	Not at All	A Little A Bit	Moderately	Quite a Bit	Extremely
21. Feeling that people are unfriendly or dislike you	a)	b)	c)	d)	e)
22. Feeling inferior to others	a)	b)	c)	d)	e)
23. Nausea or upset stomach	a)	b)	c)	d)	e)
24. Feeling that you are watched or talked about by others	a)	b)	c)	d)	e)
25. Trouble falling asleep	a)	b)	c)	d)	e)
26. Having to check and double-check what you do	a)	b)	c)	d)	e)
27. Difficulty making decisions	a)	b)	c)	d)	e)
28. Feeling afraid to travel on buses, subways, or trains	a)	b)	c)	d)	e)
29. Trouble getting your breath	a)	b)	c)	d)	e)
30. Hot or cold spells	a)	b)	c)	d)	e)
31. Having to avoid certain things, places, or activities because they frighten you	a)	b)	c)	d)	e)
32. Your mind is going blank	a)	b)	c)	d)	e)
33. Numbness or tingling in parts of you body	a)	b)	c)	d)	e)
34. The idea that you should be punished for your sins	a)	b)	c)	d)	e)
35. Feeling hopeless about the future	a)	b)	c)	d)	e)
36. Trouble concentrating	a)	b)	c)	d)	e)
37. Feeling weak in parts of your body	a)	b)	c)	d)	e)
38. Feeling tense of keyed up	a)	b)	c)	d)	e)
39. Thoughts of death or dying	a)	b)	c)	d)	e)
40. Having urges to beat, injure, or harm someone	a)	b)	c)	d)	e)
41. Having urges to break or smash things	a)	b)	c)	d)	e)
42. Feeling very self-conscious with others	a)	b)	c)	d)	e)
43. Feeling uneasy in crowds, such as shopping or at the movie	a)	b)	c)	d)	e)
44. Never feeling close to another person	a)	b)	c)	d)	e)
45. Spells of terror or panic	a)	b)	c)	d)	e)
46. Getting into frequent arguments	a)	b)	c)	d)	e)
47. Feeling nervous when you are left alone	a)	b)	c)	d)	e)
48. Others not giving you proper credit for your achievements	a)	b)	c)	d)	e)
49. Feeling so restless you couldn't sit still	a)	b)	c)	d)	e)
50. Feelings of worthlessness	a)	b)	c)	d)	e)
51. Feeling that people will take advantage of you if you let them	a)	b)	c)	d)	e)
52. Feelings of guilt	a)	b)	c)	d)	e)
53. The idea that something is wrong with your mind	a)	b)	c)	d)	e)

Appendix I1

BEAC - (Side 1)

Instructions:

On this sheet you will find words which describe different kinds of moods and feeling. Mark an (X) in the boxes beside the words which describe how you typically felt right before binge eating, just before you begin to binge eat. Some of the words may seem alike, but please check all the words that typically describe your feelings right before you binge. Work rapidly.

☐ angry	☐ euphoric	☐ lightheaded	☐ sick
☐ anxious	☐ exhausted	☐ lonely	☐ sleepy
☐ apathetic	☐ failure	☐ lousy	☐ spacey
☐ awful	☐ faint	☐ loved	☐ starving
☐ bitchy	☐ fat	☐ mad	☐ stupid
☐ blank	☐ fearful	☐ mental relief	☐ tense
☐ bloated	☐ fine	☐ moody	☐ terrible
☐ blue	☐ frightened	☐ no will power	☐ thirsty
☐ bored	☐ frustrated	☐ numb	☐ ticked off
☐ can't cope	☐ good	☐ obese	☐ tired
☐ compelled	☐ gross	☐ out of control	☐ ugly
☐ confused	☐ grouchy	☐ pacified	☐ uncomfortable
☐ contented	☐ guilty	☐ panicky	☐ unhappy
☐ craving food	☐ happy	☐ physical relief	☐ unloved
☐ dazed	☐ healthy	☐ ravenous	☐ unmotivated
☐ depleted	☐ helpless	☐ relaxed	☐ unproductive
☐ depressed	☐ horrible	☐ released	☐ unreal
☐ desperate	☐ huge	☐ remorseful	☐ upset
☐ disappointed	☐ hungry	☐ resigned	☐ uptight
☐ discontented	☐ hurt	☐ rotten	☐ vibrant
☐ disgusted	☐ hyper	☐ satisfied	☐ worried
☐ distracted	☐ immobilized	☐ self-disgust	☐ worthless
☐ dizzy	☐ incoherent	☐ self-hate	
☐ down	☐ indifferent	☐ self-pity	
☐ drained	☐ irritable	☐ serene	go to next page...
☐ emotional relief	☐ isolated	☐ shaky	
☐ enjoyment	☐ jittery	☐ shame	

Appendix I1

BEAC - (Side 2)

Instructions:

This time, mark an (X) in the boxes beside the words which describe how you typically felt right in the middle of a binge, after you have begun to binge but before you stop binge eating. Work rapidly.

☐ angry	☐ euphoric	☐ lightheaded	☐ sick
☐ anxious	☐ exhausted	☐ lonely	☐ sleepy
☐ apathetic	☐ failure	☐ lousy	☐ spacey
☐ awful	☐ faint	☐ loved	☐ starving
☐ bitchy	☐ fat	☐ mad	☐ stupid
☐ blank	☐ fearful	☐ mental relief	☐ tense
☐ bloated	☐ fine	☐ moody	☐ terrible
☐ blue	☐ frightened	☐ no will power	☐ thirsty
☐ bored	☐ frustrated	☐ numb	☐ ticked off
☐ can't cope	☐ good	☐ obese	☐ tired
☐ compelled	☐ gross	☐ out of control	☐ ugly
☐ confused	☐ grouchy	☐ pacified	☐ uncomfortable
☐ contented	☐ guilty	☐ panicky	☐ unhappy
☐ craving food	☐ happy	☐ physical relief	☐ unloved
☐ dazed	☐ healthy	☐ ravenous	☐ unmotivated
☐ depleted	☐ helpless	☐ relaxed	☐ unproductive
☐ depressed	☐ horrible	☐ released	☐ unreal
☐ desperate	☐ huge	☐ remorseful	☐ upset
☐ disappointed	☐ hungry	☐ resigned	☐ uptight
☐ discontented	☐ hurt	☐ rotten	☐ vibrant
☐ disgusted	☐ hyper	☐ satisfied	☐ worried
☐ distracted	☐ immobilized	☐ self-disgust	☐ worthless
☐ dizzy	☐ incoherent	☐ self-hate	
☐ down	☐ indifferent	☐ self-pity	
☐ drained	☐ irritable	☐ serene	
☐ emotional relief	☐ isolated	☐ shaky	
☐ enjoyment	☐ jittery	☐ shame	

Appendix I2

SAC - (Side 1)

Instructions:

On this sheet you will find words which describe different kinds of moods and feeling. Mark an (X) in the boxes beside the words which describe how you typically felt right before smoking, just before you lit up. Some of the words may seem alike, but please check all the words that typically describe your feelings right before you smoke. Work rapidly.

☐ angry	☐ euphoric	☐ lightheaded	☐ sick
☐ anxious	☐ exhausted	☐ lonely	☐ sleepy
☐ apathetic	☐ failure	☐ lousy	☐ spacey
☐ awful	☐ faint	☐ loved	☐ starving
☐ bitchy	☐ fat	☐ mad	☐ stupid
☐ blank	☐ fearful	☐ mental relief	☐ tense
☐ bloated	☐ fine	☐ moody	☐ terrible
☐ blue	☐ frightened	☐ no will power	☐ thirsty
☐ bored	☐ frustrated	☐ numb	☐ ticked off
☐ can't cope	☐ good	☐ obese	☐ tired
☐ compelled	☐ gross	☐ out of control	☐ ugly
☐ confused	☐ grouchy	☐ pacified	☐ uncomfortable
☐ contented	☐ guilty	☐ panicky	☐ unhappy
☐ craving food	☐ happy	☐ physical relief	☐ unloved
☐ dazed	☐ healthy	☐ ravenous	☐ unmotivated
☐ depleted	☐ helpless	☐ relaxed	☐ unproductive
☐ depressed	☐ horrible	☐ released	☐ unreal
☐ desperate	☐ huge	☐ remorseful	☐ upset
☐ disappointed	☐ hungry	☐ resigned	☐ uptight
☐ discontented	☐ hurt	☐ rotten	☐ vibrant
☐ disgusted	☐ hyper	☐ satisfied	☐ worried
☐ distracted	☐ immobilized	☐ self-disgust	☐ worthless
☐ dizzy	☐ incoherent	☐ self-hate	
☐ down	☐ indifferent	☐ self-pity	
☐ drained	☐ irritable	☐ serene	
☐ emotional relief	☐ isolated	☐ shaky	
☐ enjoyment	☐ jittery	☐ shame	

go to next page...

Appendix I2

SAC - (Side 2)

Instructions:

This time, mark an (X) in the boxes beside the words which describe how you typically felt right in the middle of smoking a cigarette, after you have lit up but before you butt out. Work rapidly.

☐ angry	☐ euphoric	☐ lightheaded	☐ sick
☐ anxious	☐ exhausted	☐ lonely	☐ sleepy
☐ apathetic	☐ failure	☐ lousy	☐ spacey
☐ awful	☐ faint	☐ loved	☐ starving
☐ bitchy	☐ fat	☐ mad	☐ stupid
☐ blank	☐ fearful	☐ mental relief	☐ tense
☐ bloated	☐ fine	☐ moody	☐ terrible
☐ blue	☐ frightened	☐ no will power	☐ thirsty
☐ bored	☐ frustrated	☐ numb	☐ ticked off
☐ can't cope	☐ good	☐ obese	☐ tired
☐ compelled	☐ gross	☐ out of control	☐ ugly
☐ confused	☐ grouchy	☐ pacified	☐ uncomfortable
☐ contented	☐ guilty	☐ panicky	☐ unhappy
☐ craving food	☐ happy	☐ physical relief	☐ unloved
☐ dazed	☐ healthy	☐ ravenous	☐ unmotivated
☐ depleted	☐ helpless	☐ relaxed	☐ unproductive
☐ depressed	☐ horrible	☐ released	☐ unreal
☐ desperate	☐ huge	☐ remorseful	☐ upset
☐ disappointed	☐ hungry	☐ resigned	☐ uptight
☐ discontented	☐ hurt	☐ rotten	☐ vibrant
☐ disgusted	☐ hyper	☐ satisfied	☐ worried
☐ distracted	☐ immobilized	☐ self-disgust	☐ worthless
☐ dizzy	☐ incoherent	☐ self-hate	
☐ down	☐ indifferent	☐ self-pity	
☐ drained	☐ irritable	☐ serene	
☐ emotional relief	☐ isolated	☐ shaky	
☐ enjoyment	☐ jittery	☐ shame	