THE PERFECTIONISM MODEL OF BINGE EATING:

IDIOGRAPHIC AND NOMOTHETIC TESTS OF AN INTEGRATIVE MODEL

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By

SIMON BRYAN SHERRY

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dietary restraint, depressive affect, binge eating

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ABSTRACT

Perfectionism is implicated in the onset, course, and remission of disordered eating (Bastiani, Rao, Weltzin, & Kaye, 1995; Bruch, 1979; Cockell et al., 2002; Stice, 2002; Tozzi, et al., 2005; Vohs, Bardone, Joiner, & Abramson, 1999; references are contained in Appendix F on p. 271). Building on the above research tradition, this dissertation proposed and evaluated a model relating perfectionism to binge eating. This new model is termed the Perfectionism Model of Binge Eating (PMOBE). According to the PMOBE, perfectionism confers vulnerability to binge eating by generating encounters with and by magnifying responses to specific triggers of binge eating: namely, perceived discrepancies, low self-esteem, depressive affect, and dietary restraint.

A multi-site, 7-day, web-based structured daily diary study was conducted to test the PMOBE. Overall, 566 female university students participated, and these individuals provided 3509 useable diary responses. A data analytic strategy involving structural equation modeling and multilevel modeling generally supported the PMOBE. For example, a structural model relating socially prescribed perfectionism (i.e., perceiving that others are demanding perfection of oneself) to binge eating through the aforementioned binge eating triggers demonstrated acceptable fit. Multilevel mediation also indicated that the influence of self-oriented perfectionism (i.e., demanding perfection of oneself) and socially prescribed perfectionism on binge eating operated through the abovementioned binge eating triggers (excepting dietary restraint). Support for multilevel moderation was limited, but suggested that the relationship between self-oriented perfectionism and binge eating was conditional upon dietary restraint.

This study is, to my knowledge, the first to examine the perfectionism-disordered eating connection using a structured daily diary methodology. Thus, this study offered a unique perspective apart from the usual cross-sectional and nomothetic research on perfectionism and eating pathology. In particular, this study suggested that, in their day-to-day lives, perfectionistic individuals (especially socially prescribed perfectionists) inhabit a world permeated with putative triggers of binge eating. Although perfectionism appeared to generate “exposure to” binge eating triggers, by and large, it did not seem to magnify responses to these same triggers (Bolger & Zuckerman, 1995, p. 890). A somewhat qualified version of the PMOBE was thus supported, with socially prescribed perfectionism assuming greater importance than self-oriented perfectionism and with perfectionism conferring vulnerability to binge eating by generating

environments with, but not magnifying responses to, binge triggers. Overall, this dissertation contributed new knowledge to our understanding of the precipitants and the correlates of binge eating and highlighted the idea that perfectionism may play an important part in binge eating.

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LIST OF ABBREVIATIONS

AIC = Akaike information criterion

ANOVA = analysis of variance

AR(1) = first-order autoregressive error structure

BIC = Bayes information criterion

BMI = Body Mass Index

CFA = confirmatory factor analysis

CFI = comparative fit index

CB = cognitive behavioral

CBT = cognitive behavioral therapy

CI = confidence interval

DSM-IV = Diagnostic and Statistical Manual of Mental Disorders

EFA = exploratory factor analysis

FML = full maximum likelihood

GFI = goodness-of-fit index

HLM = hierarchical linear modeling

IFI = incremental fit index

IPT = interpersonal therapy

ML = maximum likelihood

MLM = multilevel modeling

NFI = normed fit index

OCPD = Obsessive-Compulsive Personality Disorder

PMOBE = perfectionism model of binge eating

RML = restricted maximum likelihood

RMSEA = root mean square error of approximation

SEM = structural equation modeling

SOP = self-oriented perfectionism

SPP = socially prescribed perfectionism

UBC = University of British Columbia

U of S = University of Saskatchewan

CHAPTER 1
GENERAL INTRODUCTION

In the following general introduction to the main study, several general issues related to binge eating are reviewed, including: (1) the definition and the prevalence of binge eating, (2) gender differences in prevalence estimates of binge eating, (3) the role of binge eating in eating pathology and in health problems, and (4) prominent empirically supported models of binge eating. Thus, this review provides general information prior to the specific model proposed and evaluated in the main study.

The Definition and the Prevalence of Binge Eating

Binge eating is defined as the rapid and the subjectively uncontrollable consumption of a large amount of food in a short period of time, usually less than two hours (American Psychiatric Association, 1994; references are contained in Appendix F on p. 199). In addition, binge eating is characterized by eating until uncomfortably full, eating apart from others, and eating in the absence of hunger. Binge eating is also typified by feeling out of control and by marked distress regarding overeating (Spitzer et al., 1993; Stice, Telch, & Rizvi, 2000).

The prevalence of Binge-Eating Disorder, based on the criteria proposed in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994), ranges from 2.0% to 4.0% in female community members and from 0.5% to 1.5% in male community members (Bruce & Agras, 1992; Kinzl, Traweger, Trefalt, Mangweth, & Biebl, 1999a, 1999b; Spitzer et al., 1992). Among individuals attending weight control programs ($N = 1785$; 89.0% women), the rate for Binge-Eating Disorder is estimated at 28.8% (Spitzer et al., 1993) whereas, for individuals seeking bariatric surgery ($N = 92$; 71.7% women), the rate of Binge-Eating Disorder is estimated at 46.7% (Adami, Gandolfo, Bauer, & Scopinaro, 1995). Furthermore, at a subclinical level, 41.9% of female high school students (French et al., 1998) and 58.8% of female university students (Edwards-Hewitt & Gray, 1993) report binge eating, making binge eating a prevalent phenomenon. From the excessively thin (Shisslak, Pazda, & Crago, 1990) to the massively obese (Adami et al., 1995) and from public school

children (Tanofsky-Kraff et al., 2004) to middle-aged community members (Spitzer et al., 1993), binge eating is found across a spectrum of ages and weights.

Gender Differences in Prevalence Estimates of Binge Eating

As suggested by the prevalence estimates reviewed above, gender differences in binge eating have been found. The female-to-male ratio in Binge-Eating Disorder is roughly 2-to-1 (Barry, Grilo, & Masheb, 2002; Spitizer et al., 1992). This finding suggests that women tend to engage in more frequent, severe, and impairing episodes of binge eating. Similarly, at a subclinical level, roughly twice as many female university students report engaging in binge eating when compared to male university students (Greenfeld, Quinlan, Harding, Glass, & Bliss, 1987; Keel, Heatherton, Dorer, Joiner, & Zalta, 2006). For example, 50.0% to 80.0% of female university students and 25.0% and 45.0% of male university students report engaging in binge eating (e.g., Katzman, Wolchick, & Braver, 1984; Edwards-Hewitt & Gray, 1993). Overall, at both a clinical and a subclinical level, women appear to engage in more binge eating than men.

Binge Eating in Eating Pathology and in Health Problems

Theoretical accounts (Stunkard, 1959), empirical investigations (Williams, Michela, Contento, Gladis, & Pierce, 1996), diagnostic manuals (American Psychiatric Association, 1994), and case studies (Telch, 1997) converge to depict binge eating as destructive. Binge eating may be viewed as a core feature of disordered eating. For instance, binge eating is featured in diagnostic criteria for most Eating Disorders in the *DSM-IV* (American Psychiatric Association, 1994). There is also evidence to suggest that binge eating is a persistent difficulty (Polivy, Zeitlin, Herman, & Beal, 1994) that is prone to reoccurrence (Agras, Telch, Arnow, Eldredge, & Marnell, 1997) and that is refractory to treatment (Agras et al., 1995). As well, obese individuals with Binge-Eating Disorder demonstrate greater impairment and distress than obese individuals without Binge-Eating Disorder (Wilfley, Wilson, & Agras, 2003). For example, obese individuals with Binge-Eating Disorder have lower psychosocial quality of life (e.g., increased public distress and decreased sexual satisfaction; Rieger, Wilfley, Stein, Marino, & Crow, 2005) and have more comorbid psychiatric distress (Fassino, Leombruni, Piero, Abbate-Daga, & Rovera, 2003; Van Hanswijck de Jonge, van Furth, Lacey, & Waller, 2003) than obese individuals who do not have Binge-Eating Disorder.

Furthermore, binge eating is linked to an assortment of health problems, including osteoarthritis, irritable bowel syndrome, chronic muscular pain, and general health dissatisfaction (Bulik & Reichborn-Kjennerud, 2003; Bulik, Sullivan, & Kendler, 2002; Reichborn-Kjennerud, Bulik, Tambs, & Harris, 2004). Binge eating is especially implicated in the pathogenesis of obesity and diabetes (Herpertz et al., 2000; Yanovski, 2003). For instance, in a 5-year prospective study, Rydall, Rodin, Olmsted, Devenyi, and Daneman (1997), found that disordered eating (including binge eating) impairs metabolic control and promotes diabetic retinopathy among females diagnosed as Type I diabetics.

Binge eating is also a contributor to obesity (i.e., a body mass index [BMI] of ≥ 30 kg/m^2). For example, in a sample of obese females, higher levels of binge eating predicted more episodes of weight cycling (i.e., repeatedly gaining and losing ≥ 9.07 kg). Furthermore, binge eating is related to weight gain over time. For instance, 1-year after cognitive-behavioral therapy for binge eating, Agras et al. (1997) showed that middle-aged obese females who ceased binge eating ($n = 31$) lost an average of 4.0 kg, whereas middle-aged obese females who continued binge eating ($n = 44$) gained an average of 3.6 kg. Given the rising obesity rates (Statistics Canada, 2002), the number of obesity-related diseases (e.g., hypertension, sleep apnea, and diabetes; Bulik & Reichborn-Kjennerud, 2003), and the estimated annual $1.8 billion direct cost of obesity to the Canadian health care system (Birmingham, Muller, Palepu, Spinelli, & Anis, 1999), greater understanding of binge eating is needed to aid in reducing and in managing obesity.

Having defined binge eating, reviewed prevalence data on binge eating, and considered the role of binge eating in eating disorders and in health problems, several empirically supported models of binge eating are now discussed.

Empirically Supported Models of Binge Eating

Numerous models of binge eating exist, with varying degrees of evidential support (for a review see Fairburn & Wilson, 1993). Seven prominent empirically supported models of binge eating are now reviewed.

The affect-regulation model of binge eating. In the affect-regulation model, negative affect is viewed as a proximal antecedent of binge eating and binge eating is believed to momentarily reduce or regulate negative affect (Polivy & Herman, 1993). For instance, using a sample of overweight, binge-eating females seeking weight-loss treatment, Greeno, Wing, and

Shiffman (2000) found that when participants used handheld computers to track mood states prior to binge-eating episodes, negative affect was identified as a precursor of binge eating. Deaver, Miltenberger, Smyth, Meidinger, and Crosby (2003) found that negative affect was higher before binge eating, decreased during binge eating, and increased again following binge eating. Overall, support for the affect-regulation model is strong (Stickney, Miltenberger, & Wolff, 1999), but there is still much to be learned about the relationship between negative affect and binge eating. For example, little is known about what precipitates negative affect among binge eaters.

The interpersonal model of binge eating. The interpersonal model holds that disturbances in relationships instigate and maintain binge-eating behavior. For example, using a qualitative interview methodology, Wasson (2003) found that 10 of 26 (38.5%) young women with bulimia mentioned interpersonal stress as a trigger of binge eating. Similarly, Wilfley et al. (1993) showed that 10 of 18 (55.5%) middle-aged women seeking treatment for non-purging bulimia identified interpersonal deficits (e.g., social isolation) as their main problem. In addition, utilizing a methodology where participants completed diary responses following social interactions, Steiger, Gauvin, Jabalpurwala, Seguin, and Stotland (1999) demonstrated that women with bulimia reported more negative social experiences than women without bulimia and experienced binge eating episodes following perceived negative social interactions. Finally, support for the interpersonal model is provided by evidence that interpersonal therapy (focusing on interpersonal functioning without targeting eating behavior) is effective in reducing binge eating (Wilfley et al., 1993).

The restraint model of binge eating. According to the restraint model, dieting "precedes and produces" (Polivy et al., 1994, p. 490) binge eating. Although the mechanism through which dietary restraint influences binge eating is in dispute (Williams et al., 1996), Polivy and Herman (1985) contend that binge eating may represent an attempt to compensate for extreme caloric restriction. Regardless, there is evidence that "dieting…precedes [binge eating] chronologically" (Polivy & Herman, 1985, p. 193). For instance, Polivy et al. (1994) showed that 21.9% of former POWS subjected to extreme food deprivation during WWII reported heavy binge eating since their imprisonment, whereas 1.5% of former non-POW combat veterans, spared from extreme food deprivation during WWII, reported heavy binge eating as part of their postwar experience. Although once believed to cause binge eating (Polivy & Herman, 1985), the hypothesized

influence of dietary restraint on binge eating has been downgraded from primary causal agent to possible contributor (Howard & Porzelius, 1999) and it is currently disputed whether dieting is an antecedent of binge eating (Herman & Polivy, 1975), a consequence of binge eating (Stice, 1998a), or both (Howard & Porzelius, 1999). Clearly, there is still a lot to be learned about the dietary restraint-binge eating link.

The escape model of binge eating. Heatherton and Baumeister's (1991) escape model postulates that (1) binge eaters possess high self-standards and view others' expectations as excessive, (2) such standards and perceptions engender failure experiences and aversive self-awareness, (3) acute, aversive self-awareness is a catalyst for negative affect, and (4) to escape from aversive self-awareness and negative affect, binge eaters restrict their cognitive focus, creating a climate wherein irrational thinking and disinhibited eating are likely to occur. Research has supported some components of the escape model (Heatherton, Striepe, & Wittenberg, 1998). For instance, undergraduate females characterized by restrained eating displayed unrestrained eating when exposed to an ego-threatening event, but not a physically threatening event (Heatherton, Herman, & Polivy, 1991). This research lends support to Heatherton and Baumeister's (1991) contention that ego threat, a form of aversive self-awareness, is involved in binge eating. Congruent with Heatherton and Baumeister's (1991) assertion that restricted cognitive focus predisposes binge eating, Heatherton, Polivy, Herman, and Baumeister (1993) have also shown that undergraduate females who typically exhibit restrained eating demonstrate unrestrained eating during a period of narrowed attentional focus. In sum, support for components of the escape model is consistent, but a complete test of the model has yet to be undertaken.

The three-factor interactive model of bulimia and binge eating. This model is reviewed in detail in the main study and is therefore discussed only briefly here. Joiner and colleagues developed a three-factor interactive model of bulimia and binge eating (Abramson, Bardone-Cone, Vohs, Joiner, & Heatherton, 2006; Bardone, Vohs, Abramson, Heatherton, & Joiner, 2000) which stipulates that high perfectionism, high body dissatisfaction, and low self-esteem interact to predict bulimia and binge eating. Several cross-sectional and longitudinal studies have demonstrated empirical support for this model (e.g., Joiner, Heatherton, Rudd, & Schmidt, 1997; Vohs, Bardone, Joiner, & Abramson, 1999).

The cognitive behavioral model of binge eating. The cognitive behavioral (CB) model of binge eating is based primarily on the CB model for bulimia (Fairburn, 1997). In the CB model for bulimia, a self-schema oriented around body shape and weight is considered central to bulimic symptomatology. Cognitive biases or distortions (e.g., selective attention to food and weight related stimuli and overestimation of body size) are believed to arise from this self-schema. Such cognitive dysfunction is, in turn, postulated to drive maladaptive eating behaviors (e.g., restricted eating, binge eating, compensatory behaviors; Williamson, White, York-Crowe, & Stewart, 2004). According to the CB model for bulimia, other factors such as low self-esteem, negative affect, all-or-nothing thinking, and high personal standards also interact with the self-schema and the cognitive biases to foster disordered eating (Fairburn, 1997). Support for the CB model for bulimia is based in large part on the success of CB treatments for Bulimia Nervosa, which address cognitive biases (e.g., attentional bias) and maladaptive behaviors (e.g., dietary restraint; Wilson & Fairburn, 1993). The CB model of bulimia is further supported by evidence that change in cognitive biases, specifically, may be critical to preventing relapse in bulimia (Fairburn, Peveler, Jones, Hope, & Doll, 1993).

Although the CB model is well-established in bulimia, less is known as to whether cognitive distortions play a central role in the onset or the maintenance of Binge-Eating Disorder (Castonguay, Eldredge, & Agras, 1995; Cooper, Wells & Todd, 2004; Fairburn, 1997). For example, the diagnostic criteria for Binge-Eating Disorder do not include the cognitive biases concerning body image present in the diagnostic criteria for Bulimia Nervosa, suggesting that cognitive features may not play a central role in Binge-Eating Disorder (Fairburn, 1997). Decaluwe and Braet (2005) found preliminary evidence that the CB model for bulimia holds in obese adolescents with binge eating. Specifically, these authors found that self-esteem, concern over weight, and dietary restraint combined to foster binge eating. However, contrary to the CB model, distorted cognitions concerning weight and shape did not appear central to explaining binge eating. Thus, although the CB model is well established in bulimia, more investigation is required to evaluate its relevance to binge eating.

The social contagion or the peer selection model of binge eating. Based on anecdotal evidence that bulimia tends to "run in groups" (Crandall, 1988, p. 589), this model stipulates that individuals learn to engage in binge eating as a result of socialization processes that occur within groups where body image is a salient concern. Socialization refers to a process in which

members of a group become more similar over time due to group pressures to conform. Consistent with this model, Crandall (1988) found that females in sororities became more alike in their binge eating levels over time. Crandall (1988) asserted that the display of binge eating attitudes and behaviors as well as "sanctions for counter-normative behavior," fostered this "contagion" in binge eating (p. 590). Meyer and Waller (2001) also found that, over time, socialization processes may lead to a convergence in personality characteristics associated with disordered eating such as perfectionism.

More recent versions of this model highlight the need to incorporate both peer selection and socialization processes in understanding social influences on binge eating (e.g., Gilbert & Meyer, 2004; Paxton, Schutz, Wetheim, & Muir, 1999; Zalta & Keel, 2006). That is, individuals who interact with one another may become more similar over time (socialization), but they may also seek out individuals who are similar to them initially (selection). In their longitudinal study of male and female college students living in a residence, Zalta and Keel (2006) demonstrated that, although socialization in binge eating occurred (i.e., residents became more or less similar in bulimic symptoms depending on whether they were living together), this effect was only observed among residents with similar personality traits who had selected to live together. Moreover, only personality traits associated with increased risk for disordered eating (e.g., perfectionism) predicted this socialization effect. This suggests that socialization processes may be most apparent among individuals who have selected to affiliate due to their existing similarities.

The social contagion or the peer selection model of binge eating may be distinguished from the interpersonal model of binge eating, in that the former proposes that natural patterns of affiliation and socialization impact binge eating, whereas the latter holds that negative and disturbed interpersonal relationships foster binge eating. Although the social contagion or the peer selection model of binge eating is provocative and highlights the importance of social factors in binge eating, it is in its infancy compared to other models described in this section.

Summation of the General Introduction

Given the prevalence and the destructiveness of binge eating, greater understanding of this phenomenon is warranted. Having discussed seven prominent empirically based models of binge eating, a new model is now proposed. This model is intended to partially synthesize and to extend the above models by introducing perfectionism as a personality vulnerability that

underlies episodes of binge eating and that engenders triggers of binge eating. This model is now presented in the main study.

CHAPTER 2
MAIN STUDY

There is a longstanding tradition of clinical observation and empirical research linking perfectionism to disordered eating (e.g., Bruch, 1979; DuBois, 1949; Garner, Olmstead, & Polivy, 1983; Vohs, Bardone, Joiner, & Abramson, 1999). In individuals with eating difficulties, perfectionism is prominent before symptom onset (Joiner, Heatherton, Rudd, & Schmidt, 1997; Killen et al., 1994), during symptom occurrence (Cockell et al., 2002; Tozzi, et al., 2005), and following symptom remission (Bastiani, Rao, Weltzin, & Kaye, 1995; Stein et al., 2002).

Several authors have suggested a key role for perfectionism in the pathogenesis of disordered eating (Hewitt, Flett, & Ediger, 1995; Kaye et al., 1998; Tyrka, Waldron, Graber, & Brooks-Gunn, 2002; Vitousek & Manke, 1994). Shafran, Cooper, and Fairburn (2002), for example, viewed eating pathology as resulting from "the expression of perfectionism in the domain of eating, shape or weight and their control" (p. 783), whereas Thompson-Brenner and Westen (2005) demonstrated that perfectionistic individuals represent a prominent subtype among patients with eating problems (see also Wonderlich et al., 2005). In a meta-analytic review of 6 longitudinal studies involving 2932 female participants, Stice (2002) also identified perfectionism as both a risk factor for (i.e., a prospective predictor of symptom onset) and a maintenance factor in (i.e., a longitudinal predictor of symptom persistence) disordered eating.

Perfectionism and Binge Eating

Despite a recent explosion of research on binge eating (see Dingemans, Bruna, & Furth, 2002; Pull, 2004), theory and research on perfectionism and eating pathology has, for the most part, focused on bulimia or anorexia, making the perfectionism-binge eating link a relatively understudied problem. That being said, prominent theoretical models (e.g., Heatherton & Baumeister, 1991) and several empirical studies (e.g., de Zwaan et al., 1994) have suggested that perfectionists' excessive need for others' approval, unrealistic self-expectations, punitive self-rebuke, intense fear of others' scrutiny, stringent self-evaluations, and unrelenting strivings are implicated in the generation of binge eating.

As a general conclusion, individuals meeting the proposed criteria for Binge-Eating Disorder in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994; see list of abbreviations on p. 9) evidence a level of perfectionism that is comparable to individuals with a *DSM-IV* diagnosis of Bulimia Nervosa and higher than community members without eating difficulties (Pratt, Telch, Labouvie, Wilson, & Agras, 2001; Raymond, Mussell, Mitchell, de Zwaan, & Crosby, 1995; Striegel-Moore et al., 2005; Tasca, Illing, Lybanon-Daigle, Bissada, & Balfour, 2003). Obsessive-Compulsive Personality Disorder (OCPD), a constellation of traits wherein perfectionism figures prominently (Grilo, 2004; Sherry, Hewitt, Flett, Lee-Baggley, & Hall, 2006), is also frequently comorbid with Binge-Eating Disorder. In their recent review, Sansone, Levitt, and Sansone (2005) identified OCPD as "the most common personality disorder" (p. 7) among patients with Binge-Eating Disorder and estimated that 15.9% of patients with Binge-Eating Disorder also have OCPD (as compared to an estimated 1.0% prevalence in community members; American Psychiatric Association, 1994).

In addition, although Heatherton and Baumeister (1991) do not explicitly mention perfectionism in their Escape Theory of Binge Eating, these authors suggest that binge eaters possess high, rigid self-standards and perceive others' expectations as unreasonable. Pratt et al. (2001) used Hewitt and Flett's (1991) model of perfectionism and reached a similar conclusion in their cross-sectional study of patients with Binge-Eating Disorder. Namely, the tendency to require perfection of oneself was elevated in female patients with Binge-Eating Disorder relative to female community members without eating problems; whereas the tendency to perceive that others require perfection of oneself was linked to increased binge eating severity. Collectively, the theory and the evidence reviewed above identify perfectionism as a potentially important factor in binge eating over and above its demonstrated importance for other—primarily restricting—forms of disordered eating such as Anorexia Nervosa.

A Three-Factor Interactive Model of Bulimia and Binge Eating

Although several longitudinal studies of perfectionism and eating pathology exist (e.g., Fichter, Quadflieg, & Rehm, 2003; O'Connor & O'Connor, 2004; Pla & Toro, 1999; Ruggiero, Levi, Ciuna, & Sassaroli, 2003), Joiner and colleagues' three-factor interactive model of bulimia and binge eating has, to date, used the strongest methods and received the clearest support (for a review see Abramson, Bardone-Cone, Vohs, Joiner, & Heatherton, 2006; Bardone, Vohs,

Abramson, Heatherton, & Joiner, 2000). In a series of four studies (two cross-sectional and two longitudinal), Joiner et al. (1997) and Vohs et al. (1999, 2001) supported an etiological model wherein high perfectionism, high body dissatisfaction, and low self-esteem interacted to predict increased bulimia in women over time.

Bardone-Cone, Abramson, Vohs, Heatherton, and Joiner (2006) also recently confirmed a variant of their three-factor interactive model that involved high perfectionism, high body dissatisfaction, and low self-efficacy (with self-efficacy understood as a central but separate aspect of self-esteem). This revised model demonstrated symptom specificity in that it predicted the binge eating aspect of bulimia, but not compensatory behavior, in women over time. Overall, the three-factor interactive model has specified when bulimia or binge eating is likely to develop, and has suggested that perfectionism may represent a risk factor that confers vulnerability to disordered eating in conjunction with other variables.

Limitations of Existing Studies

Although the three-factor interactive model has made a valuable contribution to our understanding of the connection between perfectionism and eating pathology, there is still much to learn. For example, because the three-factor interactive model is focused on moderation, it can only illuminate when (i.e., the conditions under which)—and not why (i.e., the mechanisms through which)—perfectionism is likely to result in disordered eating.[1] In addition, Shaw, Stice, and Springer (2004) recently failed to replicate the three-factor interactive model in a sample of 496 girls, despite using a methodology (e.g., an interview-based measure of bulimia) that was arguably superior to earlier research (e.g., Vohs et al., 1999, 2001). The replicability of the three-factor model is thus somewhat open to question. Finally, Joiner et al. (1997), Shaw, Stice, et al. (2004), and Vohs et al. (1999, 2001) assessed perfectionism using only a 6-item measure (Garner et al., 1983), which may not fully or precisely capture the perfectionism construct (see Enns & Cox, 2002; Sherry, Hewitt, Besser, McGee, & Flett, 2004).

Several additional areas for improvement are discernable in other studies on perfectionism and eating pathology. First, although there is a voluminous literature on perfectionism and disordered eating (see Cassin & von Ranson, 2005; Shafran & Mansell, 2001),

[1]In Vohs et al. (1999, 2001), perfectionism did not independently predict bulimia over time, thereby precluding consideration of perfectionism within a typical mediational framework (Baron & Kenny, 1986). See Shrout and Bolger (2002) for a different view suggesting that mediation analyses remain viable under such circumstances.

most research on this topic is unlikely to advance our understanding of perfectionism as a risk factor for eating pathology because it is cross-sectional. Second, although notable exceptions to this assertion exist (e.g., Joiner et al., 1997; Kaye, 1997; McGee, Hewitt, Sherry, Parkin, & Flett, 2005; Shafran et al., 2002), research on perfectionism and disordered eating is seldom grounded in a well-articulated model. Without such a model, research on perfectionism and eating pathology is unlikely to be incremental or to translate into a strategy for intervention.

Third, to my knowledge, only nomothetic, between persons research has been conducted on perfectionism and eating disorder symptomatology. It is therefore unknown whether between persons differences in perfectionism predict, exacerbate, or generate eating difficulties within a single person over time (Affleck, Zautra, Tennen, & Armeli, 1999). Results of nomothetic investigations may differ substantively from idiographic studies (Snijders & Bosker, 1999), suggesting that a within person approach to understanding perfectionism and disordered eating may offer something novel.

Fourth, longitudinal studies of perfectionism and eating difficulties have investigated either the direct effect of perfectionism on disordered eating (e.g., Tyrka et al., 2002) or the interaction between perfectionism and other variables in predicting eating problems (e.g., Vohs et al., 1999). In other words, my critique of the three-factor interactive model (see above) is applicable to the overall perfectionism and eating pathology literature insofar as both have yet to test whether the impact of perfectionism on eating difficulties is mediated by certain variables. As a consequence, there is presently no model capable of explaining *why or how* perfectionism is instigative of disordered eating over time.

Lastly, with studies ranging from several weeks (Vohs et al., 2001) to twelve years (Sullivan, Bulik, Fear, & Pickering, 1998), much has been learned from longitudinal research on perfectionism and eating pathology. However, it is not known if, when, or why perfectionism influences daily variability in eating problems. In short, little is currently known—on a day-to-day, micro-analytic level—about perfectionism's role in transmitting risk for eating difficulties. Studying perfectionism and disordered eating on a daily basis is also likely to diminish biased recall by tracking eating problems and associated difficulties closer to their actual point of occurrence (Smyth et al., 2001; Tennen, Affleck, Armeli, & Carney, 2000).

In summary, a connection between perfectionism and disordered eating has been observed utilizing various populations, measures, and methods (Franco-Paredes, Mancilla-Díaz,

Vázquez-Arévalo, López-Aguilar, & Álvarez-Rayón, 2005; Goldner, Cockell, & Srikameswaran, 2002). However, several large gaps still exist in our understanding of the perfectionism-eating pathology relationship in general and in the perfectionism-binge eating relationship in particular.

Through this investigation I begin to fill these gaps by articulating a new model relating perfectionism to binge eating and by testing it using the first structured daily diary study of perfectionism and binge eating.

The Perfectionism Model of Binge Eating (PMOBE)

The purpose of this section is threefold. First, I outline how perfectionism is conceptualized in the PMOBE. Then, the manner in which binge eating is operationalized within the PMOBE is considered. Finally, the PMOBE is discussed as a novel model intended to explain when and why perfectionism is related to binge eating.

Perfectionism in the PMOBE

A number of useful models of perfectionism exist (e.g., Dunkley, Zuroff, & Blankstein, 2003; Frost, Marten, Lahart, & Rosenblate, 1990; Garner et al., 1983). However, several unique features of Hewitt and Flett's (1991) multidimensional model of trait perfectionism make it especially well-suited to the PMOBE. Unlike unidimensional models of perfectionism derived from cognitive perspectives wherein perfectionism is understood as predominantly self-focused (e.g., Shafran et al., 2002), Hewitt and Flett's (1991) multidimensional model involves both *intra*personal and *inter*personal perspectives and distinguishes where perfectionistic demands originate from (self vs. other).

More specifically, Hewitt and Flett (1991) conceptualized perfectionism as three distinct and enduring dimensions: self-oriented perfectionism (i.e., an intrapersonal dimension involving rigidly and ceaselessly demanding perfection of oneself), socially prescribed perfectionism (i.e., an interpersonal dimension involving the perception that others are demanding perfection of oneself), and other-oriented perfectionism (i.e., an interpersonal dimension involving harshly and unrelentingly demanding perfection of others). Other-oriented perfectionism is not discussed further, as neither theory nor evidence has linked this variable to disordered eating.

Self-oriented perfectionism (SOP) and socially prescribed perfectionism (SPP) are both consistently implicated in (e.g., Cockell et al., 2002; Hewitt et al., 1995; McLaren, Gauvin, & White, 2001) and differentially related to (e.g., Bastiani et al., 1995; Castro et al., 2004; McVey,

Pepler, Davis, Flett, & Abdolell, 2002) disordered eating, suggesting merit in distinguishing between SOP and SPP. In fact, Sherry et al. (2004) argued and demonstrated that failing to differentiate SOP from SPP may distort or suppress unique information in predicting eating pathology.

Distinguishing between SOP and SPP is also important, as some authors have emphasized the role of self-related perfectionistic expectations in disordered eating (e.g., Shafran et al., 2002), whereas other authors have stressed that interpersonally-based perfectionistic expectations are central to eating pathology (e.g., Bruch, 1981). Adopting Hewitt and Flett's (1991) multidimensional model allowed me to remain open to the possibility that SOP and SPP are both involved in (or differentially involved in) binge eating, which is important because our understanding of the connection between perfectionism and binge eating is still emerging. Having discussed perfectionism, I now address how binge eating is operationalized within the PMOBE.

Binge Eating in the PMOBE

Binge eating—rapid and subjectively uncontrollable consumption of a large amount of food in a short period of time, usually less than two hours—is a core feature of disordered eating (American Psychiatric Association, 1994; Wilfley, Wilson, & Agras, 2003). More specifically, binge eating is characterized by (1) eating apart from others, (2) feeling out of control, (3) eating an excessive amount, (4) rapid consumption of food, (5) eating without being hungry, (6) eating until uncomfortably full, and (7) marked distress surrounding overeating (Spitzer et al., 1993; Stice, Telch, & Rizvi, 2000). In operationalizing binge eating within the PMOBE, I focused only on binge eating behavior (e.g., quickly eating a large quantity of food). Emotional eating (e.g., eating when feeling sad), compensatory behavior (e.g., laxative use), and post-binge emotionality (e.g., feeling guilty after overeating) were not considered part of binge eating behavior. Thus, in the PMOBE, binge eating was understood as involving criteria (1) to (6), but not criterion (7).

Binge eating is a chronic (Wilfley et al., 2003), recurrent (Safer, Lively, Telch, & Agras, 2002), and impairing (Striegel-Moore et al., 2005) form of psychopathology that is resistant to treatment (Agras et al., 1995). In addition, binge eating is frequently comorbid with health problems such as obesity (Yanovski, 2003) and psychiatric difficulties such as depression (Bulik, Sullivan, & Kendler, 2002). From a diagnostic standpoint, approximately 2.0% to 4.0% of female community members and 0.5% to 1.5% of male community members (Bruce & Agras,

1992; Spitzer et al., 1992; Kinzl, Traweger, Trefalt, Mangweth, & Biebl, 1999a, 1999b) meet criteria proposed in *DSM-IV* for Binge-Eating Disorder (American Psychiatric Association, 1994). Severe binge eating is especially common among patients attending weight control programs (Spitzer et al., 1993). For example, Spitzer et al. (1992) studied 1785 such patients (89.0% women) and found 28.8% satisfied criteria for Binge-Eating Disorder. At a subdiagnostic level, 19.3% of community members ($N = 1031$; 62% women; Spitzer et al., 1992) report a problematic binge eating pattern. University students, in particular, appear prone to binge eating (e.g., Hawkins & Clement, 1980; Spitzer et al., 1992). For instance, 50.0% to 80.0% of female university students and 25.0% and 45.0% of male university students indicate that they engage in binge eating (e.g., Edwards-Hewitt & Gray, 1993; Pyle, Mitchell, Eckert, Halvorson, Neuman, & Goff, 1983). As suggested by the above evidence, at both a clinical and a subclinical level, binge eating is especially prevalent in women, with women being roughly twice as likely as men to engage in binge eating (e.g., Spitizer et al., 1992; Edwards-Hewitt & Gray, 1993).

In several models and measures of binge eating (e.g., Garner et al., 1983), the concept of negative affect (e.g., feeling sad, upset, or guilty) is confounded with the concept of binge eating. For example, "When I feel anxious, I find myself eating" (see item 9 from the Three-Factor Eating Questionnaire by Stunkard and Messick in 1985). Distinguishing binge eating behavior (e.g., eating until excessively full) from binge eating affectivity (e.g., feeling distressed before bingeing) allowed me to concentrate on whether perfectionism is predictive of binge eating independent of negative affect. This is a potentially important consideration, given that perfectionism is routinely and moderately predictive of negative affect (e.g., Besser, Flett, & Hewitt, 2004; Chang, 2000; Dunkley et al., 2003; Powers, Koestner, & Topciu, 2005).

Measuring binge eating behavior (which I will henceforth refer to as simply binge eating) using a structured daily diary methodology also enabled me to quantify bingeing closer to when it happened in real time. Self-report data involving retrospective recall have been shown to underestimate the frequency of binge eating (Bardone, Krahn, Goodman, & Searles, 2000; le Grange, Gorin, Catley, & Stone, 2001), suggesting merit in a diary approach (see Appendix A on p. 130 for further discussion). There is also evidence indicating that reactance (i.e., behavioral change occurring as a result of being assessed or monitored) is minimal, or nonexistent, when binge eating is measured using a daily experience methodology (le Grange, Gorin, Dymek, & Stone, 2002; Stein & Corte, 2003). Having discussed perfectionism and binge eating, I now

proceed to explaining their interrelation within the PMOBE.

Structure and Process in the PMOBE

According to the PMOBE, perfectionism is a multidimensional personality trait (involving SOP and SPP) that is capable of instigating and maintaining a problematic binge eating pattern over time. Perfectionism is hypothesized to operate as a "multivariate risk factor" (Stice, 2002, p. 841) for binge eating that confers risk independent of other factors (i.e., as a main effect) and in conjunction with other factors (i.e., within a multivariate model). From a multivariate perspective, perfectionism is believed to confer risk for binge eating by interacting with and by bringing about four factors: namely, (1) perceived discrepancies, (2) low self-esteem, (3) depressive affect, and (4) dietary restraint. I refer to these factors as binge triggers because they are proposed to operate as proximal antecedents of binge episodes. These factors may be divided into two categories: Self-evaluative features (i.e., perceived discrepancies and low-self esteem) and symptomatic features (i.e., depressive affect and dietary restraint). I now expand on the self-evaluative and the symptomatic features of the PMOBE, which represent both common correlates of perfectionism and putative triggers of binge eating.

The Self-Evaluative Features of the PMOBE

Negative self-evaluation and perfectionism go hand and hand. Perfectionists' intense self-scrutiny, unrealistic expectations, and interpersonal sensitivities make self-dissatisfaction a likely occurrence (Burns, 1980; Sherry, Hewitt, Lee-Baggley, Flett, & Besser, 2005). In particular, case studies (Weiss, Katzman, & Wolchik, 1985) and empirical studies (McGee et al., 2005) converged on low self-esteem and perceived discrepancies as pernicious aspects of perfectionists' lives capable of engendering binge eating. Encouraged by theory and by evidence tying social dysfunction to binge eating (e.g., Maharaj, Rodin, Connolly, Olmsted, & Daneman, 2001; Steiger, Gauvin, Jabalpurwala, Seguin, & Stotland, 1999; Wilfley, Pike, & Striegel-Moore, 1997), I also incorporated both intrapersonal (i.e., evaluating oneself vis-à-vis personal standards and expectations) and interpersonal (i.e., evaluating oneself in relation to others' views and expectations) perspectives on the self into the PMOBE.

Perceived discrepancies. Blatt (1995), Hewitt and Flett (2002), Horney (1950), and Sorotzkin (1985) have all suggested that perceived intrapersonal discrepancies (i.e., viewing oneself as falling short of one's expectations) and perceived interpersonal discrepancies (i.e.,

viewing oneself as falling short of others' expectations) are endemic to perfectionism. Such discrepancies are also commonly discussed as precipitants of binge eating (Gormally, Black, Daston, & Rardin, 1982; Heatherton & Baumeister, 1991; Striegel-Moore, Silberstein, & Rodin, 1993). Considered together, the rigid, harsh, and unrealistic self-evaluative style that characterizes SOP and the hypersensitivity to others' evaluations and expectations that accompanies SPP are likely to create an environment saturated with perceived discrepancies that are conducive to binge eating episodes.

Unlike prior research representing perceived discrepancies as a fixed and an immobile structural element of perfectionism (e.g., Slaney, Rice, & Ashby, 2002; Slaney, Rice, Mobley, Trippi, & Ashby, 2001), in the PMOBE, perfectionistic individuals' perceived discrepancies are understood both as chronic (in that they will almost inevitably occur, remit, and reappear over time) *and* as fluctuating (insofar as meaningful daily variability is expected to take place). This fluid and dynamic conceptualization enabled me to examine the unfolding of perfectionism and perceived discrepancies in day-to-day life and to determine if, when, and why perfectionism and perceived discrepancies result in binge eating over time.

To date, only cross-sectional research has directly considered the potential role of perceived discrepancies in the perfectionism-eating pathology relationship, with McGee et al. (2005) showing that perceived discrepancies moderated the connection between perfectionistic tendencies and eating problems in a sample of undergraduate females. Steiger et al. (1999, 2005) have also conducted research that speaks, albeit indirectly, to the association between perceived discrepancies and binge eating over time. In their research on daily variability in self-criticism, a concept that is similar to but separable from intrapersonal discrepancies (see p. 767 of Steiger et al., 1999), Steiger et al. (1999, 2005) demonstrated that self-criticism is an antecedent of binge eating in women with bulimia. Having discussed perceived discrepancies, I now consider low self-esteem, the other self-evaluative feature in the PMOBE.

Low self-esteem. Perfectionism and self-esteem are commonly discussed in case studies (Wurman, 1989) and in treatment models (Katzman, Weiss, & Wolchik, 1986) as destructive factors that confer vulnerability to binge episodes in conjunction with one another. A direct connection between perfectionism and binge eating (McCabe & Vincent, 2003), self-esteem and perfectionism (Hewitt et al., 1995), and binge eating and self-esteem (Isnard et al., 2003) is also discernable in cross-sectional research. However, apart from the three-factor interactive model

(Abramson et al., 2006), there is no longitudinal research integrating perfectionism, self-esteem, and disordered eating within a multivariate model. Moreover, self-esteem is operationalized as relatively stable and as exclusively intrapersonal in the three-factor interactive model (Holm-Denoma et al., 2005; Shaw, Stice, et al., 2004; Vohs et al., 2001; see Vohs et al., 1999 for an exception), leaving open to question whether self-esteem has an impact on the perfectionism-binge eating relationship when it is viewed as a fluctuating process or understood as having a salient interpersonal component.

Within the PMOBE, esteem is understood as a dynamic form of self-evaluation that is divisible into intrapersonal esteem (i.e., feelings of self-worth based on self-evaluations) and interpersonal esteem (i.e., feelings of self-worth based on perceptions of others' evaluations). My conceptualization of interpersonal esteem is generally consistent with what James (1890, p. 294) referred to as the "social self" (i.e., one's perceptions of how others' view oneself). Drawing on James' notion of the social self, Striegel-Moore et al. (1993) argued that individuals with eating problems "appear preoccupied with…how others perceive and evaluate them" (p. 297). I concur with Striegel-Moore et al.'s (1993) assessment and add it to my belief that SPP is a contributor to this preoccupation.

For individuals characterized by elevated SOP or SPP, establishing and maintaining a sense of worth and a satisfying, positive self-view is a difficult (perhaps insurmountable) task, since the attainment of esteem is contingent on meeting self-imposed or externally-based unrealistic standards. Congruent with prior nomothetic research (e.g., Cockell et al., 2002; Flett, Hewitt, Blankstein, & O'Brien, 1991), in the PMOBE it is asserted that SOP and SPP rob individuals of esteem. I also go beyond the extant nomothetic research to examine the widely held (but currently untested) belief that SOP and SPP create susceptibility to binge episodes by bringing about and/or by interacting with diurnal fluctuations in esteem (e.g., Weiss et al., 1985; Wurman, 1989).

Having discussed the self-evaluative features of the PMOBE, its symptomatic features are now considered.

The Symptomatic Features of the PMOBE

From full-blown, diagnosable episodes of depression (Enns & Cox, 1999, 2005) and anorexia (Cockell et al., 2002; Halmi et al., 2000) to less severe and relatively transient periods of depressive affect (Besser et al., 2004; Dunkley et al., 2003) and dietary restraint (O'Connor &

O'Connor, 2004; Ruggiero et al., 2003), the symptomatic features of the PMOBE are a common (if not an inescapable) part of many perfectionists' everyday experiences. In fact, according to the PMOBE, periods of depressive affect (i.e., feeling sad, cheerless, miserable, etc.) and attempts at dietary restraint (i.e., behaviors resulting in reduced intake of calories) suffuse the lives of perfectionists, creating an environment wherein binge eating is a probable occurrence.

Depressive affect. Perfectionists' typical manner of thinking (e.g., rigid and extreme cognition; Brown & Beck, 2002), relating (e.g., interpersonal disharmony; Hewitt, Flett, Sherry, & Caelian, 2006), and behaving (e.g., pursuit of unrealistic goals; Pliner & Haddock, 1996) may be seen as conducive to depressive affect. There is also ample evidence suggesting that depressive affect is an antecedent to binge eating (Greeno, Wing, & Shiffman, 2000; Lingswiler, Crowther, & Stephens, 1987; Steiger et al., 2005), with binge eating understood as a way of reducing, regulating, or escaping depressive affect (Deaver, Miltenberger, Smyth, Meidinger, & Crosby, 2003; Heatherton & Baumeister, 1991; McManus & Waller, 1995). Although well-researched, there is still much to be learned about the depressive affect-binge eating link. For example, what underlies binge eaters' negative reactions to and recurrent experiences with depressive affect? In the PMOBE, perfectionism is offered as the answer to this question.

Dietary restraint. Dietary restraint is also proposed to predispose binge eating within the PMOBE and in other models (e.g., Fairburn, Cooper, & Cooper, 1986; Polivy & Herman, 1985; Stice, 2001). This proposition is, however, currently in dispute (e.g., Goodrick, Poston, Kimball, Reeves, & Foreyt, 1998; Johnson & Wardle, 2005; Williams, Michela, Contento, Gladis, & Pierce, 1996). For example, contrary to the widely held supposition that dietary restraint "precedes and produces" (Polivy, Zeitlin, Herman, & Beal, 1994, p. 490) binge eating, Presnell and Stice (2003) and Stice, Presnell, Groesz, and Shaw (2005) showed that dietary restraint, which resulted in weight loss or in weight maintenance, actually decreased bulimic pathology in young women over time (at least when dieting restraint was encouraged via a systematized, clinician-delivered program).

Given their all-or-nothing, feast-or-famine, cognitive appraisal style (Rice, Vergara, & Aldea, 2006) and their inflexible and unrealistic goal setting and pursuit (Hewitt & Flett, 2002), perfectionists (especially self-oriented perfectionists) are likely to attempt to engage in a rigid and an extreme pattern of dietary restraint. Such a pattern is much different from the measured and the reasonable form of dietary restraint recommended to, and presumably adopted by,

participants in Stice's research (Presnell & Stice 2003; Stice et al., 2005). Rather than adopting a moderate caloric restriction strategy, it is possible that perfectionists excessively and unbendingly pursue dietary restraint, and in doing so, inadvertently expose themselves to an increased likelihood of binge eating over time. Considered from this perspective, binge eating in perfectionistic individuals may reflect an effort to compensate for caloric deprivation arising from dietary restraint (Polivy & Herman, 1985). Alternatively, by struggling to maintain a hypo-caloric state, perfectionists may exhaust their self-regulatory resources and render themselves susceptible to "self-regulatory failures" (Muraven, Tice, & Baumeister, 1998, p. 785) such as binge eating. Perfectionism may thus be understood as an underlying personality vulnerability capable of explaining the paradoxical co-existence of dietary restraint and binge eating within a single person from one day to the next. Overall, both the mood states and the restraint attempts that permeate the lived daily experience of perfectionistic individuals may be seen as "setting conditions" (Kiemle, Slade, & Dewey, 1987, p. 387) for binge episodes.

Relations Between the Self-Evaluative and the Symptomatic Features of the PMOBE

The self-evaluative and the symptomatic features of the PMOBE are believed to arise from perfectionism, to generate binge eating, *and* to influence one another. For instance, as Higgins asserted (e.g., Higgins, 1987; Strauman & Higgins, 1988), falling short of self-generated or socially-based expectations is likely to foster low self-esteem and to generate depressive affect. In addition, as Strauman, Vookles, Berenstein, Chaiken, and Higgins (1991) argued, perceived discrepancies may motivate individuals to engage in maladaptive behaviors, such as excessive dietary restraint, in an attempt to narrow the gap between who they are and who they want to be or who they are and who they believe others want them to be. Consistent with the above theory, research has demonstrated that perceived discrepancies are associated with low self-esteem (Hannover, Birkner, & Pohlmann, 2006; Moretti & Higgins, 1990), depressive affect (Kinderman & Bentall, 1996; Tangney, Niedenthal, Covert, & Barlow, 1998), and dietary restraint (Cash & Szymanski, 1995; Strauman et al., 1991).

In the PMOBE and in other research (Beck, 1987; Cockell et al., 2002; Ormel, Oldehinkle, & Vollebergh, 2004), low self-esteem is also seen as a likely contributor to depressive affect and to dietary restraint. There is abundant research suggesting that low self-esteem predisposes and maintains depressive affect (Brown, Bifulco, & Andrews, 1990; Heimpel, Wood, Marshall, & Brown, 2002; Metalsky, Joiner, Hardin, & Abramson, 1993).

Individuals with feelings of low self-worth have also been shown to attempt to bolster their views of themselves or to enhance others' perceptions of them by restricting their caloric intake in an effort to control their weight (Byrne & McLean 2002; Fairburn, Cooper & Cooper, 1986; Gilbert & Meyer, 2005).

Ethnicity and the PMOBE

At one time, disordered eating was viewed as a culturally-bound phenomenon because of the reportedly high frequency of eating pathology among middle- to upper-class Caucasian women and the purportedly low frequency of eating pathology in non-Western countries and minority populations (e.g., Crago, Shisslak & Estes, 1996). Increasingly, however, evidence is emerging that disordered eating occurs in a number of non-Western countries (e.g., China, Japan, and the Philippines; Huon, Mingyi, Oliver, & Xiao, 2002; Lorenzo, Lavori, & Lock, 2002; Nakamura et al., 1999) and across various minority groups living in Western countries (e.g., Asians, Blacks, and Hispanics; Crago et al., 1996; le Grange, Stone, & Brownell, 1998; Smith, 1995). Overall, then, there is growing interest in exploring ethnic differences and similarities in eating problems (e.g., Striegel-Moore et al., 2000; Wassenaar, le Grange, Winship, & Lachenicht, 2000).

With respect to the PMOBE, research suggests that perfectionism is observable in samples of Asians residing in China and in Japan (e.g., Cheng, Chong, & Wong, 1999; Yamaguchi et al., 2000) and in samples of Asians living in North America (e.g., Castro & Rice, 2003; Chang, Watkins, & Banks, 2004). Evidence also indicates that perfectionism and binge triggers are related to eating pathology in both European Americans and Asian Americans (Davis & Katzman, 1999; Phan & Tylka, 2006). For example, Shaw, Ramirez, Trost, Randall, and Stice (2004) found depressive affect, low self-esteem, and dietary restraint appeared to function as risk factors for eating problems in both Asian American and European American women. Despite such findings, studies of risk factors for eating problems in ethnic groups are scare, and further research is needed to establish whether models of disordered eating, such as the PMOBE, generalize across ethnic groups.

Hypotheses Derived From the PMOBE

Building on past theory and evidence (e.g., Beck, 1983; Hewitt et al., 2006; Robins & Block, 1988; Zuroff & Mongrain, 1987), I conceptualized self-focused, *intra*personal concerns

as most relevant to SOP and socially-based, *inter*personal concerns as most pertinent to SPP. That is, according to the PMOBE, self-oriented perfectionists exhibit greater sensitivity to intrapersonal difficulties (e.g., harsh self-criticism and negative self-appraisal), which is consistent with their excessive concern over self-definition and achievement; whereas socially prescribed perfectionists encounter more interpersonal difficulties (e.g., feeling that others are critical of them or disappointed in them), which is congruent with their distorted and exaggerated focus on relatedness (Blatt & Zuroff, 1992; Hewitt & Flett, 1991).

When testing the PMOBE, I conducted nomothetic, between persons analyses using structural equation modeling (SEM) and idiographic, within person analyses using multilevel modeling (MLM). Both approaches to study hypotheses are now reviewed. Figure 2.1 is also available to facilitate understanding of how the PMOBE was evaluated.

Nomothetic Hypotheses

In the SOP component of the PMOBE it is proposed that SOP is generative of binge eating through intrapersonal discrepancies, intrapersonal esteem, depressive affect, and dietary restraint (see Figure 2.2). Similarly, in the SPP component of the PMOBE, SPP is hypothesised to propagate binge eating via interpersonal discrepancies, interpersonal esteem, depressive affect, and dietary restraint (see Figure 2.3). Binge triggers are therefore postulated to explain why or how perfectionism is instigative of binge eating (Baron & Kenny, 1986; Holmbeck, 1997).

Other mediated effects are also predicted in the structural models for the SOP and the SPP components of the PMOBE. For instance, interpersonal esteem is proposed to mediate the SPP-dietary restraint link and dietary restraint is hypothesized to mediate the relation between interpersonal esteem and binge eating (see Figure 2.3). Binge triggers are also postulated to predict each other in a specified manner (e.g., interpersonal esteem predicting dietary restraint in Figure 2.3). On a nomothetic level, the PMOBE may thus be seen as an integrative model not only relating SOP and SPP to binge eating through triggers of binge episodes but also connecting triggers of binge episodes to one another.

Idiographic Hypotheses

When viewed from an idiographic perspective, the PMOBE may be understood as the unfolding of a dynamic temporal process that is driven by perfectionism. On a micro-analytic level, perfectionism is hypothesized to transmit risk for binge eating by magnifying responses to

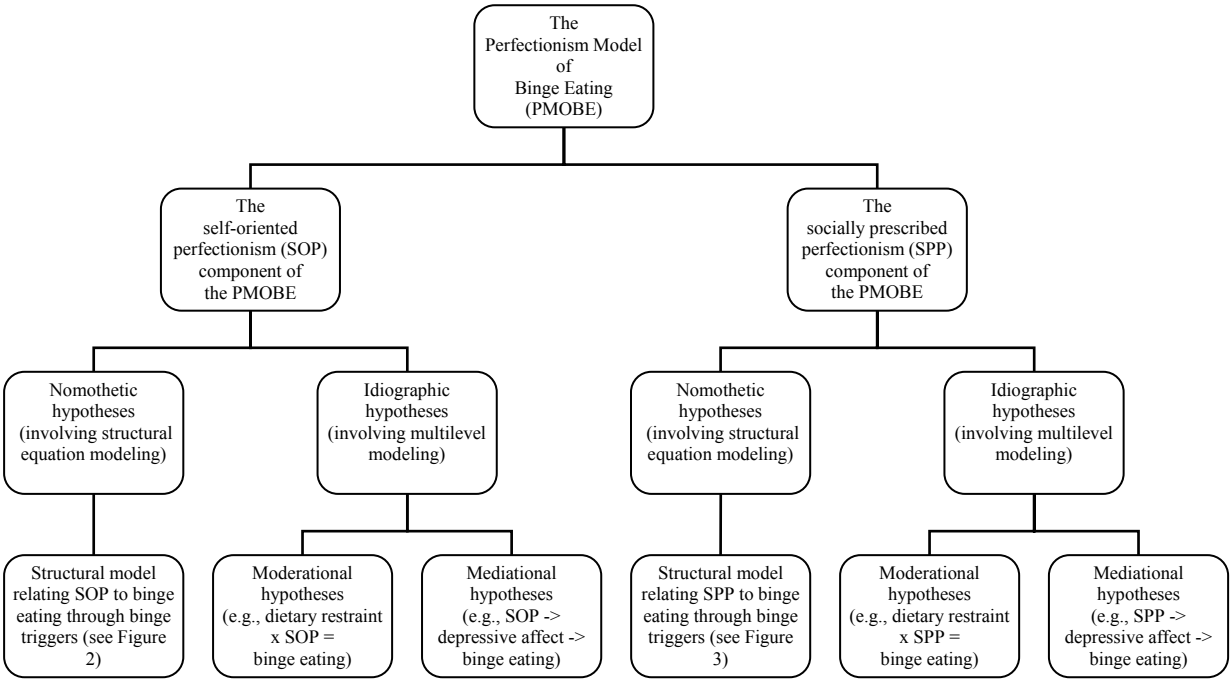

Figure 2.1 A schematic representing hypotheses derived from the PMOBE.

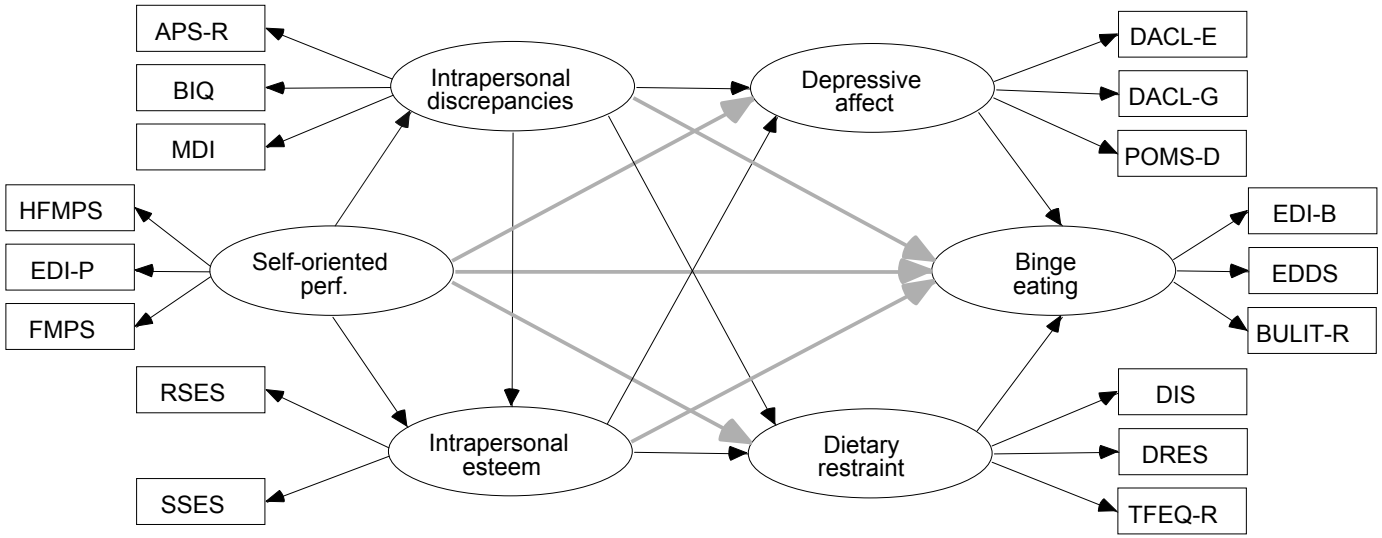

Figure 2.2 The structural model for the SOP component of the PMOBE. Ovals represent latent variables; rectangles represent manifest variables. Thin black arrows represent hypothesized direct effects; thick grey arrows represent hypothesized mediated effects. Self-oriented perf. = self-oriented perfectionism.

Note. APS-R = the global intrapersonal discrepancies subscale from the Almost Perfect Scale-Revised (Slaney et al., 2001); BIQ = the appearance intrapersonal discrepancies subscale from the Body-Image Ideals Questionnaire (Cash & Szymanski, 1995); MDI = the global intrapersonal discrepancies subscale from the Multidimensional Discrepancy Inventory (Flett & Hewitt, 2006); HFMPS = the self-oriented perfectionism subscale from Hewitt and Flett's Multidimensional Perfectionism Scale (Hewitt & Flett, 1991); EDI-P = the self-oriented perfectionism subscale of the Eating Disorder Inventory Perfectionism Scale (Garner et al., 1983); FMPS = the personal standards subscale from Frost's Multidimensional Perfectionism Scale (Frost et al., 1990); RSES = intrapersonal esteem measured by the Rosenberg Self-Esteem Scale (Rosenberg, 1965); SESS = the performance self-esteem subscale of the State Self-Esteem Scale (Heatherton & Polivy, 1991); DACL-E = depressive affect measured by the Depression Adjective Checklist: Form E; DACL-G = depressive affect measured by the Depression Adjective Checklist: Form G; POMS-D = the depressive affect subscale of the Profile of Mood States (McNair, Lorr, & Droppleman, 1992); EDI-B = the binge eating subscale of the Eating Disorder Inventory Bulimia Scale (Garner et al., 1983); EDDS = the binge eating subscale of the Eating Disorder Diagnostic Scale (Stice et al., 2000); BULIT-R = the binge eating subscale of the Bulimia Test-Revised (Thelen, Farmer, Wonderlich, & Smith, 1991); DIS = the abstaining from eating subscale of the Dietary Intent Scale (Stice, 1998b); DRES = dietary restraint measured by the Dutch Restrained Eating Scale (van Strien, Frijters, Bergers, & Defares, 1986); TFEQ-R = the dietary restraint subscale of the Three-Factor Eating Questionnaire (Stunkard & Messick, 1985).

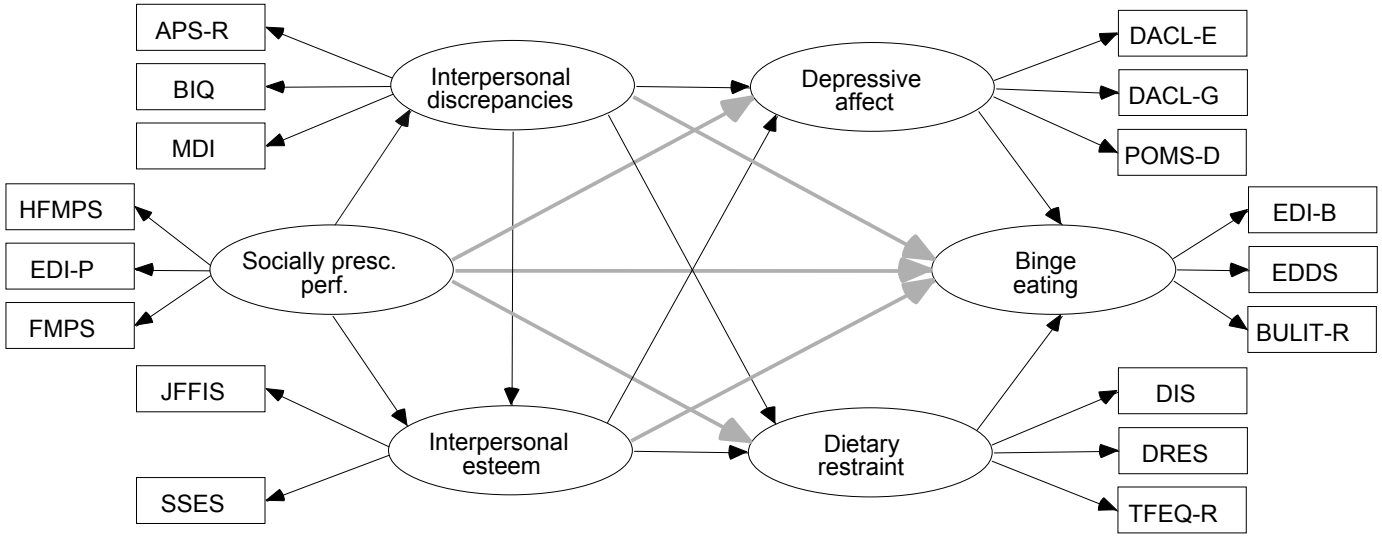

Figure 2.3 The structural model for the SPP component of the PMOBE. Ovals represent latent variables; rectangles represent manifest variables. Thin black arrows represent hypothesized direct effects; thick grey arrows represent hypothesized mediated effects. Socially presc. perf. = socially prescribed perfectionism.

Note. APS-R = the global interpersonal discrepancies subscale from the Almost Perfect Scale-Revised (Slaney et al., 2001); BIQ = the appearance interpersonal discrepancies subscale from the Body-Image Ideals Questionnaire (Szymanski & Cash, 1995); MDI = the global interpersonal discrepancies subscale from the Multidimensional Discrepancy Inventory (Flett & Hewitt, 2006); HFMPS = the socially prescribed perfectionism subscale from Hewitt and Flett's Multidimensional Perfectionism Scale (Hewitt & Flett, 1991); EDI-P = the socially prescribed perfectionism subscale of the Eating Disorder Inventory Perfectionism Scale (Garner et al., 1983); FMPS = the interpersonal perceptions subscale from Frost's Multidimensional Perfectionism Scale (Frost et al., 1990); JFFIS = the social self-esteem subscale of the Janis-Field Feelings of Inadequacy Scale (Janis & Field, 1959); SESS = the social self-esteem subscale of the State Self-Esteem Scale (Heatherton & Polivy, 1991); DACL-E = depressive affect measured by the Depression Adjective Checklist: Form E; DACL-G = depressive affect measured by the Depression Adjective Checklist: Form G; POMS-D = the depressive affect subscale of the Profile of Mood States (McNair et al., 1992); EDI-B = the binge eating subscale of the Eating Disorder Inventory Bulimia Scale (Garner et al., 1983); EDDS = the binge eating subscale of the Eating Disorder Diagnostic Scale (Stice et al., 2000); BULIT-R = the binge eating subscale of the Bulimia Test-Revised (Thelen et al., 1991); DIS = the abstaining from eating subscale of the Dietary Intent Scale (Stice, 1998b); DRES = dietary restraint measured by the Dutch Restrained Eating Scale (van Strien, Frijters, Bergers, et al., 1986); TFEQ-R = the dietary restraint subscale of the Three-Factor Eating Questionnaire (Stunkard & Messick, 1985).

and by generating encounters with binge triggers. In their day-to-day lives, perfectionistic individuals are therefore proposed (1) to respond to binge triggers with more severe binge episodes and (2) to generate or to encounter an increased number of binge triggers, thereby increasing their likelihood of engaging in binge eating over time. That is, SOP and SPP are expected to moderate the relationship between daily binge triggers and daily binge episodes and daily binge triggers are anticipated to mediate the association between SOP or SPP and daily binge eating (Baron & Kenny, 1986; Kenny, Korchmaros, & Bolger, 2003).

SOP and SPP are thus hypothesized to create an environment wherein binge eating is a highly probable occurrence by heightening reactivity to and by increasing exposure to binge triggers (see Bolger & Zuckerman, 1995). Perfectionistic individuals are therefore viewed as "active agents" (Srivastava, John, Gosling, & Potter, 2003, p. 1042) who are not only responsive to their environments but also authors of their environments. In other words, both reactions to and encounters with binge triggers are seen as part of the unfolding or the manifestation of perfectionism in daily life over time. From this perspective, binge triggers (e.g., perceived discrepancies) represent a sort of friction that perfectionists create as they move through their environments across time.

The Incremental Validity of the PMOBE

We also evaluated whether the PMOBE in general, and SOP and SPP in particular, contributed to our understanding of binge eating and binge triggers above and beyond neuroticism (i.e., the tendency to experience negative emotional states). The PMOBE was expected to remain essentially unchanged once neuroticism was taken into account, thereby suggesting a unique role for this model. Neuroticism is a suitable and a stringent control variable as it is related to perfectionism (especially SPP; Enns, Cox, & Clara, 2005; Hill, McIntire, & Bacharach, 1997), binge triggers (Kling, Ryff, Love, & Essex, 2003; Suls & Martin, 2005), and binge eating (Bulik et al., 2002; Rieder & Ruderman, 2001). My attention to incremental validity is consistent with calls from other researchers to examine whether lower-order domains of personality such as SOP and SPP offer something unique compared to higher-order domains of personality such as neuroticism (e.g., Enns & Cox, 1997; Enns et al., 2005; Paunonen, 1998; Watson, Clark, & Harkness, 1994).

The Generalizability of the PMOBE

Recruiting an ethnically and a geographically diverse sample (see the Method section) also enabled me to examine whether the PMOBE generalized across data collection sites (i.e., University of Saskatchewan and University of British Columbia) and ethnic identities (i.e., Asian Canadians and European Canadians). The relationships specified in the PMOBE were hypothesized to generalize across data collection sites and ethnic identities. For example, a positive and a moderate association between SPP and binge eating was expected in both sites and within both ethnicities. This expectation is grounded in evidence suggesting that the connections predicted by the PMOBE are discernable in and comparable across various locations and ethnicities within Canada and abroad (Bizeul, Sadowsky, & Rigaud, 2001; Davis, 1997; Sassaroli & Ruggiero, 2005), including persons from Asian backgrounds (Castro & Rice, 2003; Cheng et al., 1999; Leung, Wang, & Tang, 2004).

Method

Participants and Procedures

This investigation involved two interrelated phases. During Phase 1, which occurred in a university lab, participants provided demographics and completed personality questionnaires. Phase 2 commenced the day after Phase 1 was finished. During Phase 2 of this study, participants completed an Internet-based, structured daily diary once per day for seven consecutive days. This Internet-based diary was completed from home utilizing a website designed for this investigation.

The aforementioned website, which contained 88 questions, was designed using Macromedia's Dreamweaver MX (2004 Education Version). In designing this website, technical support was generously provided by the Web Development Manager of the Department of Psychology at the University of British Columbia (UBC). Although this website has been deactivated, it was located at the following address: http://viscog.psych.ubc.ca/~hewittlab/diary/pscdiary.psy.

Pilot testing, which involved more than 20 university students and resulted in several revisions, helped ensure that the website was user friendly. In providing their response to a given question (e.g., a 6 on a Likert scale ranging from 1 to 7), participants simply clicked their mouse

on their desired numeric response. To safeguard participants' confidentiality, all diary responses were encrypted when transmitted over the Internet.

In teaching participants how to take part in this investigation, trained lab assistants followed a standardized study protocol. As part of this study protocol, a lab assistant provided the participant with a guided tour of the website and gave the participant an opportunity to interact with the website. Each participant was also given a unique ID (e.g., UBC1) and password (e.g., AAA1), which was used each time the participant entered the website. Finally, no Internet-related technical problems (e.g., server outages) were reported during the course of this investigation.

A total of 572 female university students taking first- or second-year psychology courses participated in this study. All 572 participants completed Phase 1. Two participants were dropped because they reported situations that may have influenced their eating behaviors (specifically, one participant reported undergoing dental surgery mid study and another participant indicated that she was pregnant). Two participants were also dropped because they "backfilled" their diaries (i.e., they provided all seven of their daily reports in a single day). Two additional participants who completed Phase 1 were dropped because they failed to provide sufficient Phase 2 data (i.e., at least one complete daily report). Thus, 566 female undergraduates (representing 99.0% of the initial sample) were included in the final sample. Of these students, 178 (31.4%) were from the University of Saskatchewan (U of S; Saskatoon, Canada) and 388 (68.6%) were from UBC (Vancouver, Canada). U of S students and UBC students were combined to form one sample. This decision is elaborated on below (see the Results section).

Data collection occurred in October and in November of 2004. No students participated during Thanksgiving due to anticipated eating irregularities during this time. U of S and UBC participants were recruited from the undergraduate research pools in their respective Departments of Psychology. Participants responded to an ad requesting their involvement in a study on personality. In exchange for their participation, U of S and UBC students received a 2.0% bonus added to their course grade. U of S participants also received a $5 payment. This study was approved by the U of S and the UBC Behavioral Research Ethics Boards. Participation in this study was anonymous and voluntary and all participants provided informed consent. Participants were also debriefed following their involvement in this study (see Appendix H on p. 236).

Participants averaged 19.53 years of age (*SD* = 2.60) and 1.86 years of study in university (*SD* = 1.02); 46.1% of students were in their first year of university, 32.5% were in their second year, 12.4% were in their third year, 7.4% were in their fourth year, and 1.6% were in their fifth year or higher. With respect to relationship status, 93.6% percent of participants described themselves as either "single" or "dating." Overall, 45.4% of women reported their ethnicity as Asian, 45.4% as European, 3.4% as mixed (e.g., Asian and European), 2.8% as East Indian, 1.2% as Middle Eastern, and 1.8% were classified as other (e.g., Latino). Participants reported living in Canada for an average of 14.73 years (*SD* = 7.11). Study participants also reported an average body mass index (BMI = kg/m^2) of 21.06 (*SD* = 2.94). A BMI value between 18.5 and 24.9 is considered to be normal weight (Health Canada, 2003). Participant demographics from this study were comparable to other samples of university students recruited at U of S (e.g., Morrison & Harriman, 2005) and at UBC (e.g., Sherry, Hewitt, Flett, & Harvey, 2003).

Five hundred and sixty-six participants completed Phase 2 (representing 99.0% of Phase 1 participants). These 566 participants provided 3901 structured daily diaries. All participants were instructed to complete their daily diary just before going to bed. To encourage protocol compliance, each day participants received a personalized reminder via email to complete their diary. Participants' daily reports were date and time stamped so as to verify accurate and timely reporting. Reports provided by participants between 7 p.m. and 4 a.m. were retained for analyses. Late entries were not included in this study. In total, 10.0% (392 of 3901) of daily reports were dropped because they did not fit within the 7 p.m. to 4 a.m. reporting window. Thus, 3509 diary responses were included in the final sample, meaning that 88.6% (3509 of 3962) of all possible daily reports were returned in a useable, timely manner. This represented an average of 6.20 daily reports per person. Response rates were consistently high across days; response rates ranged from a high of 94.5% (535 of 566) on Day 1 to a low of 85.7% (485 of 566) on Day 5.

Measures

The nine constructs of the PMOBE were each measured with three separate indicators (except for self-esteem). For example, dietary restraint was measured using the Dutch Restrained Eating Scale (van Strien, Frijters, Bergers, et al., 1986), the abstaining from eating subscale of the Dietary Intent Scale (Stice, 1998b), and the restraint subscale of Three-Factor Eating Questionnaire (Stunkard & Messick, 1985). Intrapersonal and interpersonal esteem were each measured with two indicators. Measuring constructs with multiple, separate indicators is central

to SEM and helps to ensure increased generality in that findings are not dependent on a particular scale (Cohen, Cohen, West, & Aiken, 2003). Constructs, and their constituent indicators, are described below.

Neuroticism was also measured in this investigation and functioned as a control variable in various analyses. A single indicator was used to assess neuroticism. In this study, measures were scored such that higher scores signify higher levels of a construct. All measures in this investigation are presented in Appendix G on p. 215. During Phase 1, participants completed the following measures:

Trait perfectionism

Hewitt and Flett's Multidimensional Perfectionism Scale (HFMPS). The HFMPS (Hewitt & Flett, 1991) is a 45-item measure of trait perfectionism divided into three, 15-item subscales that assess HFMPS-SOP (i.e., demanding perfection of oneself; e.g., "One of my goals is to be perfect in everything I do"), HFMPS-SPP (i.e., perceiving that others are demanding perfection of oneself; e.g., "People expect nothing less than perfection from me"), and other-oriented perfectionism (i.e., demanding perfection of others). Congruent with previous research (Sherry et al., 2003), in this study coefficient alphas for SOP ($\alpha = .89$) and for SPP ($\alpha = .85$) were high. Both the reliability and the validity of the HFMPS are well-established in samples of university students (e.g., Hewitt & Flett, 1991, 2004). For example, using an undergraduate sample, Hewitt and Flett (1991) showed that the 3-month test-retest correlations for SOP, other-oriented perfectionism, and SPP are .88, .85, and .75, respectively. The HFMPS is also moderately to strongly related to one widely used measure of perfectionistic attitudes: namely, the perfectionism subscale of Weissman and Beck's (1978) Dysfunctional Attitude Scale (Sherry et al., 2003).

Eating Disorder Inventory Perfectionism Scale (EDI-P). The EDI-P (Garner et al., 1983) is a 6-item measure of trait perfectionism composed of two subscales: EDI-SOP (3 items) and EDI-SPP (3 items). In order to assess trait perfectionism apart from developmental history, to reduce memory bias, and to broaden the interpersonal content of the EDI-P, the tense and the scope of EDI-P items were modified so as to be more consistent with Hewitt and Flett's (1991) model and measure of trait perfectionism. For instance, the EDI-SPP item "As a child, I tried very hard to avoid disappointing my parents and teachers" was revised to "I try very hard to avoid disappointing others." In this study, coefficient alphas for SOP ($\alpha = .66$) and for SPP ($\alpha =$

.67) were comparable to earlier research (Joiner et al., 1997). The EDI-P has good psychometric properties in samples of undergraduates (Joiner & Schmidt, 1995), including evidence indicating that the 3-week test-retest coefficient for this scale is .86 among university students (Wear & Pratz, 1987). Sherry, Hall, Hewitt, Flett, and Besser (2006) also supported the validity of the EDI-P by showing that it is strongly correlated with the HFMPS.

Frost's Multidimensional Perfectionism Scale (FMPS). This study used the personal standards subscale (5 items) and the parental perceptions subscale (5 items) from Cox, Enns, and Clara's (2002) revision of the FMPS (Frost et al., 1990). One personal standards item and one parental perceptions item were dropped from the FMPS since they appear in the EDI-P. As was done with the EDI-P, the tense and the scope of the parental perceptions subscale were revised in order to be more consistent with the SPP construct. For example, "I never felt like I could meet my parents' expectations" was changed to "I never feel like I can meet others' expectations." To reflect those modifications, the parental perceptions subscale is henceforth referred to as the interpersonal perceptions subscale. The personal standards subscale did not require alteration to serve as an indicator of SOP. Consonant with past evidence (Sherry, Hall, et al., 2006), coefficient alphas for the personal standards subscale ($\alpha = .76$) and the interpersonal perceptions subscale ($\alpha = .75$) were acceptable in this study. The 10-week test-retest correlation was .73 for the personal standards subscale in a sample of undergraduates (Rice & Dellwo, 2001), whereas the test-retest correlation for the interpersonal perceptions subscale has yet to be studied. Overall, research has consistently supported the validity and the reliability of the FMPS in samples of students (Cox et al., 2002; Frost et al., 1990; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993). For example, the FMPS and the HFMPS are moderately to strongly intercorrelated in samples of undergraduates (e.g., Cox et al., 2002; Frost et al., 1993).

Neuroticism

Big Five Inventory Neuroticism Subscale (BFI-N). The BFI-N (Benet-Martinez & John, 1998) is an 8-item measure of neuroticism (i.e., the tendency to experience negative emotional states; e.g., "I see myself as someone who gets nervous easily"). As in other research (Srivastava et al., 2003), the BFI-N displayed good alpha reliability in this study ($\alpha = .79$). Overall, research suggests that the BFI-N has good psychometrics in undergraduates (John & Srivastava, 1999), including evidence showing that the 3-month test-retest coefficient for the BFI-N is .85 in student samples (Benet-Martinez & John, 1998). John and Srivastava (1999) also

reported that the correlation between the BFI-N and the neuroticism subscale of the NEO-FFI (Costa & McCrae, 1992) is .76, thereby supporting the validity of the BFI-N.

In Phase 2, a 24-hour timeframe was clearly specified for all measures. As is commonly done in diary research (e.g., Crocker, Karpinski, Quinn, & Chase, 2003; Fortenberry et al., 2005), when necessary, measures were slightly modified so as to agree with the 24-hour timeframe adopted in this study. For example, the Rosenberg Self-Esteem Scale (Rosenberg, 1965) item "I feel I do not have much to be proud of" was changed to "During the past 24 hours, I felt I did not have much to be proud of."

In Phase 2, coefficient alphas were calculated based on 1-week aggregates of scale items. Participants completed the following measures during Phase 2:

Intrapersonal and interpersonal discrepancies

Multidimensional Discrepancy Inventory (MDI). The 5-item, global intrapersonal discrepancies subscale (i.e., viewing oneself as falling short of one's expectations; e.g., "Did your behaviors fall short of your expectations?") and the 5-item, global interpersonal discrepancies subscale (i.e., viewing oneself as falling short of others' expectations; e.g., "Did your behaviors fall short of other people's expectations?") from Flett and Hewitt's (2006) MDI were utilized. Coefficient alphas for MDI subscales typically range from .75 to .95 (Flett & Hewitt, 2006), as was the case for intrapersonal discrepancies ($\alpha = .94$) and for interpersonal discrepancies ($\alpha = .95$) in this study. Flett and Hewitt (2006) showed that the MDI has good psychometric properties in students. The original and the revised MDI global intrapersonal discrepancies subscales are strongly correlated at .78 ($p < .001$). The relation between the original and the revised MDI global interpersonal discrepancies subscales is also strong ($r = .73$, $p < .001$; Sherry & Hall, 2006; Appendix E on p. 190).[2]

Body-Image Ideals Questionnaire (BIQ). The BIQ (Cash & Szymanski, 1995; Szymanski & Cash, 1995) was used to measure appearance-related intrapersonal discrepancies (i.e., viewing one's appearance as falling short of one's expectations) and appearance-related

[2]A cross-sectional study was conducted to examine the correlation between the original measures (e.g., the MDI) and the revised daily measures used in Phase 2 (e.g., the MDI revised to suit a 24-hour timeframe). This study involved 112 university students (37 men; 75 women). Participants were recruited from a U of S introductory psychology course and averaged 22.38 years of age (SD = 6.65) and 1.60 years of university education (SD = 1.04); 67.9% of students were in their first year of university, 15.2% were in their second year, 11.6% were in their third year, and 5.3% were in their fourth year or higher. The results from this research are presented in the Method section (and in Appendix E) and are referenced as Sherry and Hall (2006; Appendix E).

interpersonal discrepancies (i.e., viewing one's appearance as falling short of others' expectations). Only BIQ items related to weight and to shape (e.g., chest size) were used in this study, resulting in five items per subscale. Items that measured appearance-related interpersonal discrepancies were reworded so as to widen their interpersonal content (e.g., "My partner's ideal for weight…" was modified to "Other people's ideal for my weight…"). As in Cash (2000), coefficient alphas for BIQ intrapersonal discrepancies ($\alpha = .92$) and for BIQ interpersonal discrepancies ($\alpha = .94$) were high in this study. The reliability and the validity of the BIQ are established in students (Cash, 2000; McGee et al., 2005). The original and the revised appearance-related intrapersonal discrepancies subscales are strongly related ($r = .66$, $p < .001$). A .31 ($p < .001$) correlation between the original and the revised appearance-related interpersonal discrepancies subscales was also obtained in Sherry and Hall (2006; Appendix E on p. 190). This moderate correlation is somewhat lower than expected, and is likely attributable to the different interpersonal content of each scale (i.e., the original BIQ scale assesses romantic partners, whereas the revised BIQ scale assesses generalized others).

Almost Perfect Scale-Revised (APS-R). Global intrapersonal discrepancies were assessed using the discrepancy subscale from the APS-R (Slaney et al., 2001), which has displayed good psychometrics in undergraduates (Grzegorek, Slaney, Franze, & Rice, 2004; Slaney et al., 2002). The four items that loaded highest on Slaney et al.'s (2001) factor analysis of the APS-R discrepancy subscale were selected for this study. For each item assessing global intrapersonal discrepancies (e.g., "My best was not good enough for me"), a corresponding item measuring global interpersonal discrepancies was generated (e.g., "My best was not good enough for others"). This resulted in a 4-item global intrapersonal discrepancies scale and a 4-item global interpersonal discrepancies scale. Coefficient alphas for APS-R intrapersonal discrepancies ($\alpha = .96$) and for APS-R interpersonal discrepancies ($\alpha = .98$) were high; these findings match earlier research (Sherry & Hall, 2006; Appendix E on p. 190). The link between the original and the revised APS-R global intrapersonal discrepancies subscales is strong ($r = .68$, $p < .001$; Sherry & Hall, 2006; Appendix E on p. 190).

Intrapersonal and interpersonal esteem

State Self-Esteem Scale (SSES). The performance self-esteem subscale (e.g., "I felt confident about my abilities") from Heatherton and Polivy's (1991) SSES was utilized to measure intrapersonal esteem (i.e., feelings of self-worth based on self-evaluations); whereas the

SSES social self-esteem subscale (e.g., "I was worried about what other people thought of me") was used to assess interpersonal esteem (i.e., feelings of self-worth based on perceptions of others' evaluations). Drawing on Heatherton and Polivy's (1991) factor analysis, the four highest loading items for each SSES subscale were used in this study. As observed in past research (Herrald & Tomaka, 2002), coefficient alphas for performance ($\alpha = .90$) and social self-esteem ($\alpha = .94$) were high in this study. Investigations have supported the validity and the reliability of the SSES in undergraduates (Heatherton & Wyland, 2003). Sherry and Hall (2006; Appendix E on p. 190) showed that the original and the revised performance self-esteem subscales are strongly linked ($r = .74$, $p < .001$) and the original and the revised social self-esteem subscales are strongly related ($r = .77$, $p < .001$).

Rosenberg Self-Esteem Scale (RSES). Rosenberg's (1965) RSES (e.g., "I was inclined to feel that I was a failure") measured intrapersonal esteem. The RSES has been utilized in other diary studies (Crocker et al., 2003). The two highest loading positively worded RSES items and the two highest loading negatively worded RSES identified in Gray-Little, Williams, and Hancock's (1997) factor analysis were included in this study. The coefficient alpha for the RSES was .92 in this study, as has been found elsewhere (Blascovich & Tomaka, 1991). There is abundant evidence supporting the psychometric adequacy of the RSES in student samples (e.g., Blascovich & Tomaka, 1991; Gray-Little et al., 1997). The original and the revised RSES are strongly overlapping ($r = .71$, $p < .001$; Sherry & Hall, 2006; Appendix E on p. 190).

Janis-Field Feelings of Inadequacy Scale (JFFIS). The social self-esteem subscale of the JFFIS (Janis & Field, 1959), as revised by Fleming and Courtney (1984), was utilized as a measure of interpersonal esteem. In this study, the four items that loaded highest on Fleming and Courtney's (1984) factor analysis of the social self-esteem subscale were used. As in past research (Blascovich & Tomaka, 1991), the coefficient alpha for the JFFIS was .92 in this study. The JFFIS social self-esteem subscale has satisfactory reliability and validity in samples of undergraduates (Blascovich & Tomaka, 1991; Fleming & Watts, 1980). Sherry and Hall (2006; Appendix E on p. 190) showed that the relation between the original and the revised JFFIS social self-esteem subscale is strong ($r = .65$, $p < .001$).

Depressive affect

Profile of Mood States (POMS-D). McNair et al.'s (1992) POMS-D was utilized to measure depressive affect (i.e., feeling sad, cheerless, miserable, etc.). Congruent with other

diary studies (Bolger, Zuckerman, & Kessler, 2000), the four highest loading POMS-D items identified in a factor analysis performed by Lorr and McNair (1971) were used in this study. In keeping with other investigations (Curran, Andrykowski, & Studts, 1995), in this study the coefficient alpha for the POMS-D was high (α = .93). Research by Bolger and Zuckerman (1995) and by others (McNair et al., 1992) has supported the reliability and the validity of the POMS-D in samples of undergraduates. For example, the POMS-D is strongly correlated with depressive symptoms in university students (Malouff, Schutte, & Ramerth, 1985). The three depressive affect measures utilized in this study were not included in Sherry and Hall (2006; Appendix E on p. 190), since these measures are commonly used in diary research (e.g., Bolger et al., 2000; Bolger and Zuckerman, 1995) and did not require modification for this study.

Depression Adjective Checklist: Form E (DACL-E) and Form G (DACL-G). As in previous diary studies (e.g., Zautra, Guenther, & Chartier, 1985), the DACL-E and the DACL-G (Lubin, 1965) were utilized to measure depressive affect (e.g., feeling "depressed," "downcast," etc.). Specifically, the four highest loading DACL-E items and the four highest loading DACL-G items from Van Whitlock, Lubin, and Noble's (1995) factor analysis were used in this research. Coefficients alpha for the DACL-E (α = .95) and the DACL-G (α = .92) were high in this study; other researchers have found similar results (Lubin, Van Whitlock, Swearngin, & Seever, 1993). There is evidence to suggest that the DACL-E and the DACL-G have good psychometric characteristics in samples of university students (Lubin et al., 1993; Shaver & Brennan, 1991). For instance, in samples of undergraduates, the DACL-E and the DACL-G are strongly correlated with measures of depressive symptoms (Lubin & Van Whitlock, 1996).

Dietary restraint

As suggested by Stice, Fisher, and Lowe (2004), dietary restraint was measured utilizing only "items describ[ing] concrete behaviors…use[d] to reduce caloric intake" (p. 57). Specific, concrete eating behaviors (e.g., "I skipped a meal in an effort to control my weight") were assessed in an attempt to augment the validity of self-reported dietary restraint, which Stice, Fisher, and Lowe (2004) have recently called into question to some extent.

Dutch Restrained Eating Scale (DRES). The DRES (van Strien, Frijters, Bergers, et al., 1986) measured dietary restraint (i.e., behaviors resulting in reduced intake of calories; e.g., "I refused food or drink offered because I was concerned about my weight"). Consonant with Johnson and Wardle (2005), the five highest loading items from van Strien, Frijters, van

Staveren, Defares, and Deurenberg's (1986) factor analysis of the DRES were used. The coefficient alpha for the DRES is usually high (e.g., Gorman & Allison, 1995), as was the case in this study (α = .94). There is also evidence supporting the psychometric adequacy of the DRES in samples of undergraduates (e.g., Allison, Kalinsky, & Gorman, 1992). The link between the original and the revised DRES is strong (r = .80, p < .001; Sherry & Hall, 2006; Appendix E on p. 190).

Dietary Intent Scale (DIS). The 3-item abstaining from eating subscale from the DIS (Stice, 1998b) measured dietary restraint (e.g., "I ate only one or two meals to try to limit my weight"). As in Stice (1998b), the coefficient alpha for the abstaining from eating subscale was high (α = .94). Research has suggested that the DIS is valid and reliable (Stice, 1998a). For example, Stice, Fisher, and Lowe (2004) showed that the DIS is negatively related to unobtrusively recorded caloric intake. The original and the revised abstaining from eating subscales are correlated at .95 (p < .001; Sherry & Hall, 2006; Appendix E on p. 190).

Three-Factor Eating Questionnaire (TFEQ-R). The restraint subscale of Stunkard and Messick's (1985) TFEQ-R measured dietary restraint (e.g., "I deliberately took small helpings as a means of controlling my weight"). The four highest loading TFEQ-R items from Bond, McDowell, and Wilkinson's (2001) factor analysis were utilized. The coefficient alpha for the restraint subscale was .97, thereby approximating past research (Laessle, Tuschl, Kotthaus, & Prike, 1989). The restraint subscale has good psychometrics in undergraduates (Laessle et al., 1989). The correlation between the original and the revised restraint subscales is .65 (p < .001; Sherry & Hall, 2006; Appendix E on p. 190).

Binge eating

Instructions for measures of binge eating behavior offered participants a definition for words or phrases such as "bingeing" or "binge eat." For example, participants were instructed that "'Eating binge,' 'binge eat,' etc. refer to the rapid and the uncontrollable consumption of a large amount of food in a short period of time, usually less than two hours." This definition corresponds with *DSM-IV's* (1994) definition of binge eating.

Bulimia Test-Revised (BULIT-R). The binge subscale of the BULIT-R (Thelen et al., 1991), as developed by Lowe, Gleaves, and Murphy-Eberenz (1998), measured binge eating behavior (e.g., "I ate a lot of food when I wasn't even hungry"). Three BULIT-R items were dropped: One because it was not adaptable to a 24-hour timeframe; one because it was

confounded with dietary restraint; and, one because it was redundant with another subscale item. This resulted in a 9-item subscale. In this study, the coefficient alpha for the binge subscale (α = .92) resembled past research (Sherry & Hall, 2006; Appendix E on p. 190). Both the reliability and the validity of the BULIT-R binge subscale are established in undergraduate samples (Thelen, Mintz, & Vander Wal, 1996). The original and the revised the BULIT-R binge subscales are correlated at .75 ($p < .001$; Sherry & Hall, 2006; Appendix E on p. 190).

Eating Disorder Inventory Bulimia Scale (EDI-B). A 4-item version of the EDI-B (Garner et al., 1983), measuring only binge eating behavior (e.g., "I stuffed myself with food"), was used. As found in other research (Espelage et al., 2003), the coefficient alpha for the EDI-B (α = .90) was high in this study. The psychometric properties of the EDI-B are good in students (Wear & Pratz, 1987). The original and the revised EDI-B are also strongly interrelated ($r = .66$, $p < .001$; Sherry & Hall, 2006; Appendix E on p. 190).

Eating Disorder Diagnostic Scale (EDDS). The binge eating subscale of the EDDS (Stice et al., 2000) is a 9-item measure of *DSM-IV* (1994) criteria for Binge-Eating Disorder. Only EDDS items capturing binge eating behavior (e.g., "There were times when I ate much more rapidly than normal") were utilized, which resulted in a 7-item subscale. The coefficient alpha for the binge eating subscale (α = .95) was high in this study; Stice, Fisher, and Martinez (2004) reported a similar alpha value. The EDDS binge eating subscale has good psychometric attributes in student samples (Dunn, Larimer, & Neighbors, 2002). Sherry and Hall (2006; Appendix E on p. 190) showed that the original and the revised EDDS binge eating subscales are strongly related ($r = .64$, $p < .001$).

Overview of Data Analyses

This study adopted a multi-step data analytic strategy. Descriptive statistics and potential means differences in demographic variables were considered first. Bivariate and partial correlations for manifest variables were computed next. In testing nomothetic hypotheses, SEM was used to evaluate the measurement and the structural model for the PMOBE. Latent correlations between variables in the structural model for the PMOBE were also examined via SEM. When idiographic hypotheses were evaluated, multilevel moderational analyses were tested and graphed and multilevel mediational analyses were conducted. Percentages of between persons and within person variance for daily variables were also calculated.

At various points in the above data analyses, the incremental validity of the PMOBE was tested. As noted above, these analyses addressed whether the PMOBE provided unique information beyond neuroticism. Finally, the generalizability of the PMOBE was tested. These analyses evaluated whether results generalized across data collection sites and ethnic identities.

Results

Descriptive Statistics

Means, standard deviations, and ranges for measures used in this study are displayed in Table 2.1. These values are based on U of S students and UBC students combined into a single sample (see Appendix C on p. 151 for further information). Descriptive statistics were considered relative to previously reported values from comparable populations. Means for demographics (e.g., Sherry et al., 2003), the HFMPS subscales (e.g., Hewitt & Flett, 2004), the EDI-P subscales (e.g., Sherry et al., 2004), the FMPS subscales (e.g., Sherry, Hall, et al., 2006), and neuroticism (e.g., Benet-Martinez & John, 1998) fell within one standard deviation of values from past research. When daily measures were aggregated across seven days, means were also within one standard deviation of values from prior research (Sherry & Hall, 2006; Appendix E on p. 190).

Demographic Variables

The U of S sample was combined with the sample from UBC and analysis of variance (ANOVA) was utilized to compare groups on demographics. Specifically, U of S students were compared to UBC students and Asian Canadians were compared to European Canadians. Asian Canadians and European Canadians comprised 90.8% (514 of 566) of the total sample in this study. ANOVAs showed that U of S students were significantly higher than students from UBC with respect to time in Canada and BMI (see upper portion of Table 2.2). These differences were moderate to large in magnitude. The finding that U of S students had lived in Canada for longer than students from UBC is consistent with the large international student population at UBC (University of British Columbia, 2005) and with the large population of Asian immigrants residing in the greater Vancouver area (Hislop et al., 2003).

Table 2.1. Means, standards deviations, and ranges for all study participants.

Manifest variables	*M*	*SD*	Possible Range	Actual Range
SOP				
HFMPS-SOP	72.66	13.81	15-105	25-104
EDI-SOP	11.80	2.88	3-18	4-18
FMPS personal standards	14.12	2.84	4-20	4-20
SPP				
HFMPS-SPP	52.94	12.78	15-105	19-92
EDI-SPP	12.66	2.79	3-18	3-18
FMPS interpersonal perceptions	9.05	3.44	4-20	4-19
Neuroticism	25.38	5.98	8-40	10-39
Intrapersonal discrep.				
MDI global intrapersonal discrep.	9.53	2.66	5-20	5-18
BIQ appear. intrapersonal discrep.	20.78	6.54	5-35	5-35
APS-R global intrapersonal discrep.	14.71	4.70	4-28	4-26
Interpersonal discrep.				
MDI global interpersonal discrep.	7.75	2.36	5-20	5-17
BIQ appear. interpersonal discrep.	18.07	5.74	5-35	5-35
APS-R global interpersonal discrep.	11.64	4.25	4-28	4-25
Intrapersonal esteem				
RSES self-esteem	20.98	4.25	4-28	7-28
SSES performance self-esteem	13.49	2.91	4-20	4-20
Interpersonal esteem				
JFFIS social self-esteem	18.46	5.27	4-28	4-28
SSES social self-esteem	14.61	3.47	4-20	4-20
Depressive affect				
POMS-D depressive affect	2.53	2.63	0-16	0-15
DACL-G depressive affect	2.05	2.58	0-16	0-14
DACL-E depressive affect	2.05	2.58	0-16	0-14
Dietary restraint				
DRES dietary restraint	10.57	4.53	5-25	5-25
DIS abstaining from eating	5.55	2.58	3-15	3-15
TFEQ-R dietary restraint	9.84	5.51	4-28	4-28
Binge eating				
BULIT-R binge eating	15.46	5.28	9-45	9-36
EDI-B binge eating	7.90	4.13	4-28	4-24
EDDS binge eating	14.16	7.22	7-49	7-45

Note. Means, standard deviations, and ranges are based on 3509 diary responses from 566 study participants; diary responses were aggregated across seven days. For Possible Range, the lowest possible value is on the left side of the dash and the highest possible value is on the right side of the dash; for Actual Range, the lowest observed value is on the left side of the dash and the highest observed value is on the right side of the dash. SOP = self-oriented perfectionism; SPP = socially prescribed perfectionism; global intrapersonal discrep. = global intrapersonal discrepancies; appear. intrapersonal discrep. = appearance-related intrapersonal discrepancies; global interpersonal discrep. = global interpersonal discrepancies; appear. interpersonal discrep. = appearance-related interpersonal discrepancies.
*$p < .01$. **$p < .001$.

Table 2.2. Analyses of variance comparing U of S students to UBC students and Asian Canadians to European Canadians on demographic variables.

Demographics variables	U of S (N = 178)		UBC (N = 388)		F (1, 564)	η^2
	M	*SD*	*M*	*SD*		
Age	19.61	3.37	19.50	2.16	0.24	.00
Time in Canada	18.23	5.72	13.13	7.12	70.59**	.11
BMI	22.04	3.57	20.62	2.48	30.19**	.05
Demographics variables	Asian Canadians (N = 257)		Euro. Canadians (N = 257)		F (1, 512)	η^2
	M	*SD*	*M*	*SD*		
Age	19.14	1.91	19.81	2.98	9.09*	.02
Time in Canada	10.82	6.68	18.67	4.99	227.33**	.31
BMI	20.11	2.26	21.96	3.28	55.20**	.10

Note. Time in Canada = number of years spent living in Canada; Euro. Canadians = European Canadians. η^2 = partial eta squared. η^2 is a measure of effect size that is comparable to a R^2 value. For example, group membership (i.e., U of S vs. UBC) accounts for 5.0% of the total variance in performance BMI scores. A η^2 value in the range of .01 signifies a small effect size; a η^2 value in the range of .06 signifies a medium effect size; a η^2 value in the range of .14 signifies a large effect size (Cohen, 1977).
*p < .01. **p < .001.

ANOVAs also indicated that European Canadians were significantly higher than Asian Canadians with respect to age, time in Canada, and BMI (see lower portion of Table 2.2). These differences were small to large in magnitude. Other investigations have found that Asians have lower BMI scores compared to Europeans (e.g., Arriaza & Mann, 2001; World Health Organization, 2004). Given the above differences, the potential influence of data collection sites and ethnic identities were taken into account in all subsequent analyses.

Bivariate Correlations

As in earlier research (e.g., Dunkley et al., 2003), manifest indicators (e.g., HFMPS-SOP, EDI-SOP, and FMPS personal standards) of latent variables (e.g., SOP) were standardized and summed prior to analyses. All correlations involving SOP and SPP, binge triggers, and binge eating were in the expected direction. Specific hypotheses were not made with regard to demographic variables. SPP was significantly correlated with binge triggers and binge eating (see lower portion of Table 2.3). SOP was also significantly correlated with binge triggers and binge eating (except for the relationship between SOP and intrapersonal esteem). Correlations involving SPP were generally moderate in magnitude, whereas correlations involving SOP were all small in magnitude.

Binge triggers were moderately and significantly correlated with binge eating (see lower portion of Table 2.3). In addition, binge triggers were significantly and moderately to strongly correlated with one another. Although several variables were strongly related, Tabachnick and Fidell's (2001) criterion for bivariate multicollinearity was not met (i.e., correlations did not exceed .90). Demographics were weakly related to manifest variables, with 26 of 54 correlations achieving significance (see Appendix D on p. 159 for further information). Small to moderate, significant correlations were also found between neuroticism and the variables of the PMOBE.

Comparing U of S students to UBC students. Statistical comparisons of bivariate correlations were conducted (see Appendix C on p. 151 for further information). Comparisons focused on the variables of the PMOBE. As an example, the correlation between SPP and depressive affect in U of S students ($r = .34$, $p < .001$) was compared to the correlation between SPP and depressive affect in UBC students ($r = .33$, $p < .001$). Across all possible comparisons, one significant difference was detected; namely, the correlation between SOP and SPP in U of S students ($r = .53$, $p < .001$) was significantly higher ($z = 2.83$, $p < .01$) than the correlation

Table 2.3. Bivariate correlations and partial correlations for manifest variables.

Manifest variables	1	2	3	4	5	6	7	8	9
1. SOP	--	.42**	.17**	.13*	.01	-.18**	.07	.19**	.19**
2. SPP	.38**	--	.31**	.34**	-.28**	-.30**	.22**	.17**	.20**
3. Intrapersonal discrep.	.17**	.41**	--	.79**	-.68**	-.52**	.50**	.44**	.44**
4. Interpersonal discrep.	.11*	.44**	.83**	--	-.64**	-.54**	.52**	.36**	.39**
5. Intrapersonal esteem	-.03	-.42**	-.73**	-.71**	--	.51**	-.57**	-.22**	-.27**
6. Interpersonal esteem	-.17**	-.42**	-.59**	-.61**	.62**	--	-.40**	-.35**	-.29**
7. Depressive affect	.11*	.33**	.59**	.59**	-.65**	-.51**	--	.18**	.28**
8. Dietary restraint	.18**	.20**	.48**	.40**	-.27**	-.39**	.24**	--	.41**
9. Binge eating	.17**	.25**	.48**	.44**	-.35**	-.37**	.35**	.46**	--
10. Neuroticism	.18**	.34**	.40**	.36**	-.44**	-.41**	.43**	.17**	.20**
11. Age	.05	-.09	.03	.01	.09	.17**	-.03	-.04	-.08
12. Time in Canada	.14**	-.06	-.13*	-.17**	.15**	.24**	-.12*	-.17**	-.17**
13. Site	.01	-.08	-.10	-.10	.08	.14**	-.07	-.06	-.09
14. Asian ethnicity	-.17**	.24**	.16**	.23**	-.22**	-.26**	.03	.11*	.11
15. European ethnicity	.10	-.23**	-.19**	-.24**	.21**	.23**	-.01	-.14**	-.09
16. BMI	-.02	.00	.16**	.14**	.00	.09	.12*	-.04	.04

Note. Bivariate correlations and partial correlations are based on 3509 diary responses from 566 study participants; diary responses were aggregated across seven days. Bivariate correlations appear below the diagonal; partial correlations appear above the diagonal. SOP = self-oriented perfectionism; SPP = socially prescribed perfectionism; Intrapersonal discrep. = intrapersonal discrepancies; Interpersonal discrep. = interpersonal discrepancies; Time in Canada = number of years spent living in Canada; Site = data collection site. For data collection site, UBC = 0 and U of S = 1; for Asian ethnicity, Asian = 1 and all other ethnicities = 0; for European ethnicity, European = 1 and all other ethnicities = 0. A correlation in the range of .10 signifies a small effect size; a correlation in the range of .30 signifies a medium effect size; a correlation in the range of .50 signifies a large effect size (Cohen, 1992).

*$p < .01$. **$p < .001$.

between SOP and SPP in UBC students ($r = .32$, $p < .001$). To conserve space, only statistics for significant comparisons are reported.

Comparing Asian Canadians to European Canadians. Further comparisons of correlations, focusing on ethnicity, were carried out in the above manner (see Appendix C on p. 151 for further information). Only one significant difference was observed: The link between intrapersonal and interpersonal esteem in European Canadians ($r = .68$, $p < .001$) was significantly higher ($z = 3.16$, $p < .001$) than the link between intrapersonal and interpersonal esteem in Asian Canadians ($r = .50$, $p < .001$). Overall, results suggested that, almost without exception, bivariate correlations generalized across data collection sites and ethnic identities.

Partial Correlations

Partial correlations controlling for neuroticism and for demographics (i.e., age, time in Canada, data collection site, ethnicity, and BMI) were computed (see upper portion of Table 2.3). Partial correlations remained substantial and significant in a manner consistent with bivariate correlations, suggesting that SOP and SPP, and the other variables of the PMOBE, provided unique information above and beyond neuroticism and demographics. More precise statistical comparisons of bivariate correlations to partial correlations were also carried out. As an illustration, the bivariate correlation between depressive affect and binge eating ($r = .35$, $p < .001$) was compared to the partial correlation between depressive affect and binge eating ($r = .28$, $p < .001$). Across all possible comparisons, only two significant differences were found: (1) The bivariate correlation between SPP and intrapersonal esteem ($r = -.42$, $p < .001$) was significantly higher ($z = 2.86$, $p < .001$) than the partial correlation between SPP and intrapersonal esteem ($r = -.28$, $p < .001$). (2) The bivariate correlation between intrapersonal and interpersonal esteem ($r = .62$, $p < .001$) was significantly higher ($z = 2.72$, $p < .001$) than the partial correlation between intrapersonal and interpersonal esteem ($r = .51$, $p < .001$). Thus, comparisons of bivariate correlations to partial correlations suggested that (with two exceptions) controlling for demographics and for neuroticism did not significantly attenuate the strength of bivariate correlations.

Comparing U of S students to UBC students. Partial correlations were compared using the data analytic strategy outlined above for comparisons of bivariate correlations. No significant differences were found across data collection sites.

Comparing Asian Canadians to European Canadians. When ethnic differences in partial correlations were examined, only one significant difference was detected: The partial correlation between intrapersonal and interpersonal esteem in European Canadians ($r = .61$, $p < .001$) was significantly higher ($z = 3.08$, $p < .001$) than the partial correlation between intrapersonal and interpersonal esteem in Asian Canadians ($r = .41$, $p < .001$). Overall, comparisons of partial correlations complemented comparisons of bivariate correlations in suggesting that, almost without exception, correlational findings generalized across both data collection sites and ethnic identities.

To summarize correlational findings, SOP was weakly and significantly correlated with binge triggers and binge eating (except for a null relation between SOP and intrapersonal esteem). In addition, SPP displayed a moderate and a significant pattern of intercorrelation with binge triggers and binge eating. Binge triggers were also found to be (1) significantly and moderately correlated with binge eating and (2) significantly and moderately to strongly correlated with each other. Furthermore, partial correlations (controlling for demographics and for neuroticism) were substantial and significant, and supported the hypothesis that the PMOBE would demonstrate incremental validity. Lastly, comparisons of correlation magnitudes suggested that correlational findings generalized across data collection sites and ethnic identities in the anticipated manner.

Structural Equation Modeling

SEM offers advantages as a data analytic strategy (see Appendix B on p. 136 for further discussion). For example, SEM also enables estimation of measurement error as well as specification and comparison of alternative models (Byrne, 2001; Schumacker & Lomax, 2004). SEM analyses were performed with AMOS 5.0 software (Arbuckle, 2003). As advised by Anderson and Gerbing (1988), measurement models were examined first and then structural models were evaluated. For SEM analyses, Phase 2 variables were aggregated across seven points in time (i.e., across seven days worth of reported data).

As recommended by Kline (2005), overall model fit was assessed with multiple indicators, including the chi-square/*df* ratio (χ^2/df), the goodness-of-fit index (GFI), the comparative fit index (CFI), the incremental fit index (IFI), and the root mean square error of approximation (RMSEA) with a 90% confidence interval (90% CI; Steiger, 1990). A χ^2/df in the range of 2 to 1 (Carmines & McIver, 1981) and a RMSEA in the range of .05 to .08 (Browne &

Cudeck, 1993) suggest adequate fit. For the GFI, CFI, and IFI, a value in the range of .95 is indicative of a reasonably well-fitting model (Kline, 2005; Schumacker & Lomax, 2004).

The Measurement Model for the PMOBE

As outlined in the Method section, the PMOBE is composed of 25 manifest variables and 9 latent variables. Confirmatory factor analysis (CFA) was used to evaluate whether the measurement models for the SOP and the SPP components of the PMOBE represented valid constructs. CFA tested the association between latent variables and their constituent manifest variables (Byrne, 2001). The measurement model for the SOP component of the PMOBE did not meet criteria for an adequately fitting model: $\chi^2(104, N = 566) = 552.93$, $p < .001$; $\chi^2/df = 5.32$; GFI = .90; CFI = .96; IFI = .96; RMSEA = .09 (90% CI: .08, .10). The SOP component of the PMOBE is therefore no longer considered with respect to SEM. However, the measurement model for the SPP component of the PMOBE was well-supported: $\chi^2(104, N = 566) = 261.09$, $p < .001$; $\chi^2/df = 2.51$; GFI = .95; CFI = .98; IFI = .98; RMSEA = .05 (90% CI: .04, .06). All factor loadings for the SPP component of the PMOBE were substantial (ranging from .47 to .99), significant, and in the expected direction (see Table 2.4). Thus, CFA suggested that the measurement model for the SPP component of the PMOBE was psychometrically sound. This measurement model continued to function adequately after neuroticism was included as a covariate: $\chi^2(115, N = 566) = 290.80$, $p < .001$; $\chi^2/df = 2.53$; GFI = .95; CFI = .98; IFI = .98; RMSEA = .05 (90% CI: .05, .06). Factor loadings were virtually unchanged after neuroticism was incorporated into the model.[3]

Comparing U of S students to UBC students. A multigroup CFA tested whether the factor loadings associated with the measurement model for the SPP component of the PMOBE were invariant across U of S students and UBC students. This multigroup CFA was conducted following Byrne (2001). A baseline model was estimated for U of S students, $\chi^2(104, N = 178) = 164.90$, $p < .001$; $\chi^2/df = 1.59$; GFI = .91; CFI = .97; IFI = .97; RMSEA = .06 (90% CI: .04, .07),

[3]The measurement model for the SPP component of the PMOBE was also supported when demographics (i.e., age, time in Canada, data collection site, ethnicity, and BMI) were included in the model: $\chi^2(170, N = 566) = 537.15$, $p < .001$; $\chi^2/df = 3.16$; GFI = .93; CFI = .97; IFI = .97; RMSEA = .06 (90% CI: .06, .07). Factor loadings were largely unaffected when demographics were built into the model. In presenting SEM analyses, a decision was made to focus on the PMOBE independent of demographics. Two factors contributed to this decision. First, demographics made only minor contributions to the measurement and the structural model for the PMOBE. Second, models with many parameters (e.g., six different demographic variables) are hard to replicate (Byrne, 2001, p. 168). Thus, SEM analyses involving demographics are presented only in footnotes.

Table 2.4. Factor loadings for the measurement model.

Latent variables and their indicators	Standardized Factor loading
SPP	
HFMPS-SPP	.84
EDI-SPP	.62
FMPS interpersonal perceptions	.75
Interpersonal discrep.	
MDI global interpersonal discrep.	.86
BIQ appear. interpersonal discrep.	.47
APS-R global interpersonal discrep.	.89
Interpersonal esteem	
JFFIS social self-esteem	.79
SSES social self-esteem	.94
Depressive affect	
POMS-D depressive affect	.95
DACL-G depressive affect	.99
DACL-E depressive affect	.96
Dietary restraint	
DRES dietary restraint	.96
DIS abstaining from eating	.90
TFEQ-R dietary restraint	.94
Binge eating	
BULIT-R binge eating	.91
EDI-B binge eating	.94
EDDS binge eating	.98

Note. The measurement model for the PMOBE is based on 3509 diary responses from 566 study participants; diary responses were aggregated across seven days. SPP = socially prescribed perfectionism; global interpersonal discrep. = global interpersonal discrepancies; appear. interpersonal discrep. = appearance-related interpersonal discrepancies. All factor loadings were $p < .001$.

and for UBC students, $\chi^2(104, N = 388) = 222.68$, $p < .001$; $\chi^2/df = 2.14$; GFI = .94; CFI = .98; IFI = .98; RMSEA = .05 (90% CI: .04, .06). Results indicated that the measurement model for the SPP component of the PMOBE adequately represented the data in U of S students and in UBC students. Once this was established, the equivalence (i.e., the invariance) of factor loadings was tested.

A constrained model (wherein factor loadings were designated invariant across groups) was compared to an unconstrained model (wherein factor loadings were freely estimated across groups) using a χ^2 difference test. According to this test, $\Delta\chi^2(11, N = 566) = 33.78$, $p < .001$, the constrained model, $\chi^2(219, N = 566) = 421.49$, $p < .001$, differed significantly from the unconstrained model, $\chi^2(208, N = 566) = 387.71$, $p < .001$, thereby pointing toward a possible discrepancy between data collection sites. A series of follow-up χ^2 difference tests indicated that U of S students differed significantly from UBC students on the latent variable for depressive affect, $\Delta\chi^2(6, N = 566) = 25.19$, $p < .001$. More specifically, the factor loading for the DACL-G depressive affect subscale was significantly higher in UBC students (.99) relative to U of S students (.98), $\Delta\chi^2(5, N = 566) = 23.23$, $p < .001$. The factor loading for the POMS-D depressive affect subscale was also significantly higher in UBC students (.96) when compared to U of S students (.93), $\Delta\chi^2(5, N = 566) = 17.79$, $p < .001$. No other significant χ^2 difference tests were found, thereby indicating a pattern of partial measurement invariance (Byrne, 2001). The partially invariant measurement model (with factor loadings for the DACL-G and the POMS-D freely estimated) fit the data well: $\chi^2(217, N = 566) = 402.03$, $p < .001$; $\chi^2/df = 1.85$; GFI = .92; CFI = .98; IFI = .98; RMSEA = .04 (90% CI: .03, .05). Although U of S students were significantly different from UBC students in terms of factor loadings for the DACL-G and the POMS-D, these differences are not necessarily meaningful. Consistent with this possibility, Byrne has criticized multigroup CFA as an overly sensitive and a potentially unstable procedure (see Byrne, 2001, p. 174; Byrne, Shavelson, & Muthen, 1989, p. 462). Most importantly, with two minor exceptions, the measurement model for the SPP component of the PMOBE was invariant across data collection sites.

Comparing Asian Canadians to European Canadians. Using the approach outlined above, a multigroup CFA evaluated whether the factor loadings accompanying the measurement model for the SPP component of the PMOBE were invariant across ethnicities. Baseline models were estimated for Asian Canadians, $\chi^2(104, N = 257) = 169.60$, $p < .001$; $\chi^2/df = 1.63$; GFI =

.93; CFI = .98; IFI = .98; RMSEA = .05 (90% CI: .04, .06), and then for European Canadians, $\chi^2(104, N = 257) = 194.91, p < .001$; $\chi^2/df = 1.87$; GFI = .92; CFI = .98; IFI = .98; RMSEA = .06 (90% CI: .05, .07). Thus, for Asian Canadians and for European Canadians, the measurement model for the SPP component of the PMOBE was well-supported. The equivalence of factor loadings was tested next.

A χ^2 difference test, $\Delta\chi^2(11, N = 566) = 41.74, p < .001$, suggested that the constrained model, $\chi^2(219, N = 566) = 406.24, p < .001$, differed significantly from the unconstrained model, $\chi^2(208, N = 566) = 364.50, p < .001$. A series of follow-up χ^2 difference tests showed that Asian Canadians were significantly different from European Canadians on the interpersonal discrepancies latent variable, $\Delta\chi^2(4, N = 566) = 22.23, p < .001$, and on the depressive affect latent variable, $\Delta\chi^2(4, N = 566) = 14.32, p < .001$. Further tests identified significant differences across three factor loadings. In terms of the interpersonal discrepancies latent variable, the factor loading for the BIQ subscale was significantly higher in Asian Canadians (.51) relative to European Canadians (.44) and the factor loading for the APS-R subscale was significantly higher in European Canadians (.90) compared to Asian Canadians (.87), $\Delta\chi^2(3, N = 566) = 21.52, p < .001$. With regard to the depressive affect latent variable, the factor loading for the POMS-D subscale was significantly higher in Asian Canadians (.96) compared to European Canadians (.94), $\Delta\chi^2(4, N = 566) = 14.32, p < .001$. No other significant χ^2 difference tests were detected, thereby demonstrating a pattern of partial measurement invariance (Byrne, 2001). The partially invariant measurement model (with factor loadings for the BIQ, the APS-R, and the POMS-D freely estimated) fit the data adequately: $\chi^2(216, N = 566) = 373.32, p < .001$; $\chi^2/df = 1.73$; GFI = .92; CFI = .98; IFI = .98; RMSEA = .04 (90% CI: .03, .04). Overall, although three minor discrepancies were observed, the measurement model for the SPP component of the PMOBE was mainly invariant across ethnicities.

In summary, the hypothesised measurement model for the SOP component of the PMOBE was not confirmed. However, the hypothesised measurement model for the SPP component of the PMOBE was identified as an adequately fitting model that was worth testing in structural form. The factor loadings associated with the measurement model for the SPP component of the PMOBE were largely invariant across data collection sites and ethnic identities, although slight differences were found on 5 of 34 comparisons. Such differences

suggest that five manifest variables in the PMOBE (e.g., the BIQ) are stronger indicators of their latent constructs in one group (e.g., Asians) as compared to another group (e.g., Europeans).

Latent Correlations

Before the structural model for the SPP component of the PMOBE was tested, latent correlations were computed (see Table 2.5). Such correlations correct for measurement error. Not surprisingly, latent correlations resembled bivariate correlations, although the former were generally larger in magnitude than the latter. All latent correlations were significant and showed that (1) SPP was moderately related to binge triggers and binge eating, (2) binge triggers were moderately correlated with binge eating, (3) binge triggers were moderately correlated with each other, and (4) neuroticism was weakly to moderately correlated with SPP, binge triggers, and binge eating. This overall pattern of intercorrelation suggested merit in testing the structural model for (and the mediational aspect of) the SPP component of the PMOBE (Holmbeck, 1997). If latent correlations were nonsignificant, "there would be no point to testing [a] mediational model that purported to explain them" (Zuroff & Duncan, 1999, p. 143).

The Structural Model for the PMOBE

Structural paths and mediated effects postulated as part of the PMOBE were tested next. The initial, partially mediated structural model for the SPP component of the PMOBE is displayed in Figure 2.3. This model included five hypothesised mediated effects and all factor loadings were freely estimated. Fit indices showed that this model was well-supported: $\chi^2(105, N = 566) = 264.32$, $p < .001$; $\chi^2/df = 2.52$; GFI = .95; CFI = .98; IFI = .98; RMSEA = .05 (90% CI: .04, .06). As expected, the following paths were not significant: SPP predicting depressive affect ($\beta = -.03$, $p > .05$); SPP predicting dietary restraint ($\beta = -.04$, $p > .05$); interpersonal esteem predicting binge eating ($\beta = -.01$, $p > .05$); and, SPP predicting binge eating ($\beta = .06$, $p > .05$). Somewhat unexpectedly, the path between interpersonal discrepancies and binge eating remained significant ($\beta = .22$, $p < .01$). As suggested by Byrne (2001), nonsignificant paths were trimmed, one path at a time. The initial model was re-estimated each time a nonsignificant path was deleted. Four insubstantial and nonsignificant paths were ultimately removed: SPP to depressive affect ($\beta = -.03$, $p > .05$), SPP to dietary restraint ($\beta = -.04$, $p > .05$), interpersonal esteem to binge eating ($\beta = -.01$, $p > .05$), and SPP to binge eating ($\beta = .06$, $p > .05$). In other words, following model trimming and re-estimation, four of five hypothesised mediated effects

Table 2.5. Latent correlations between variables involved in the structural model.

Latent variables	1	2	3	4	5	6
1. SPP	--					
2. Interpersonal discrep.	.57**	--				
3. Interpersonal esteem	-.53**	-.72**	--			
4. Depressive affect	.39**	.67**	-.57**	--		
5. Dietary restraint	.24**	.40**	-.43**	.24**	--	
6. Binge eating	.31**	.47**	-.41**	.36**	.47**	--
7. Neuroticism	.42**	.40**	-.42**	.43**	.17**	.21**

Note. Latent correlations are based on 3509 diary responses from 566 study participants; diary responses were aggregated across seven days. SPP = socially prescribed perfectionism; Interpersonal discrep. = interpersonal discrepancies.
*$p < .01$. **$p < .001$.

remained nonsignificant. This resulted in the final, fully mediated structural model for the SPP component of the PMOBE, which is shown in Figure 2.4. Fit indices suggested that this model represented the data well: $\chi^2(109, N = 566) = 266.70$, $p < .001$; $\chi^2/df = 2.45$; GFI = .95; CFI = .98; IFI = .98; RMSEA = .05 (90% CI: .04, .06). Paths in the final model were in the anticipated direction. All paths were also substantial and significant (with one exception). Though it was not significant ($\beta = .10$, $p = .06$), the path between depressive affect and binge eating was retained based on past theory and evidence (e.g., Greeno et al., 2000; Killen et al., 1996; Stice, 2001; Stice & Agras, 1998). As Loehlin (2004) has pointed out, if a path is grounded in substantive theory and evidence, it is advisable to retain the path in the model until another investigation has confirmed that it is in fact trivial and may be safely omitted.

Mediational analyses. Mediation was tested using the strategy originally proposed by Baron and Kenny (1986) and subsequently extended to SEM by others (Holmbeck, 1997; Hoyle & Smith, 1994). According to the PMOBE, binge triggers are mediational variables that specify why or how SPP is generative of binge eating. In addition to this central mediational hypothesis, four other mediated effects are proposed in the SPP component of the PMOBE. For instance, interpersonal discrepancies are hypothesized to mediate the link between SPP and depressive affect (see Figure 2.3).

A comparison of the partially mediated model (containing all hypothesised mediated effects; see Figure 2.3) to the fully mediated model (with hypothesised mediated effects trimmed; see Figure 2.4) suggested that the fully mediated model offered increased parsimony without decreased fit. Specifically, a χ^2 difference test showed no significant difference between the partially mediated model and the fully mediated model, $\Delta\chi^2(4, N = 566) = 2.38$, $p > .01$. The Akaike information criterion (AIC) and the Bayes information criterion (BIC) were also evaluated. Smaller AIC and BIC values suggest better fit and greater parsimony (Kline, 2005). Both the AIC and the BIC favoured the fully mediated model (AIC = 354.70; BIC = 545.60) over the partially mediated model (AIC = 360.32; BIC = 568.57). The fully mediated model also explained an identical amount of variance relative to the partially mediated model (with one exception). In this exception, the fully and the partially mediated model explained 46.0% and 47.0% of the variance in depressive affect (respectively). Thus, the fully mediated model was preferred over the partially mediated model, as it offered comparable fit and predictive power as well as better parsimony.

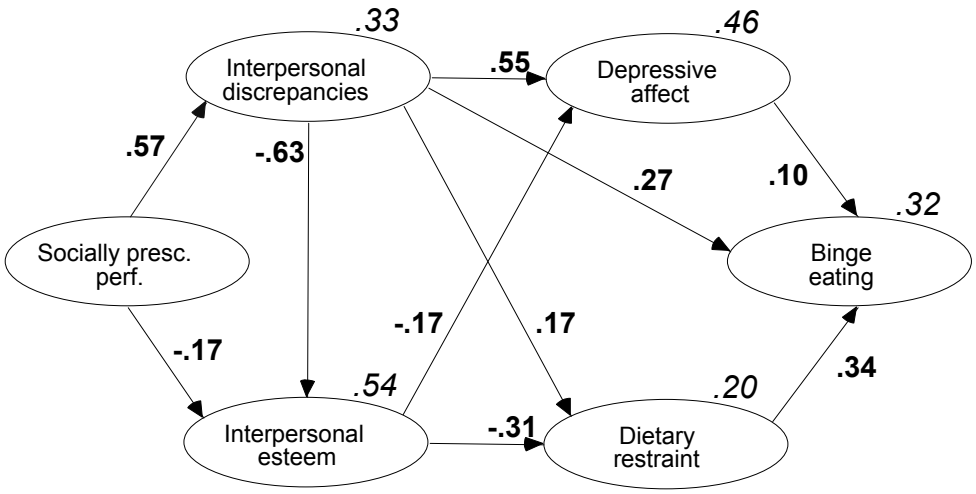

Figure 2.4 The fully mediated structural model for the SPP component of the PMOBE. This model is based on 3509 diary responses from 566 study participants; diary responses were aggregated across seven days. Ovals represent latent variables. Thin black arrows represent direct effects; hypothesized mediated effects were removed from the model. Standardized path coefficients appear in bold. Italicized numbers (e.g., .33) appearing in the upper right hand of endogenous variables (e.g., interpersonal discrepancies) represent the proportion of variance accounted for by associated exogenous variables. In the interest of clarity, manifest variables are not shown. Socially presc. perf. = socially prescribed perfectionism.

In summation, as the PMOBE predicted, SPP was related to binge eating through interpersonal discrepancies, interpersonal esteem, depressive affect, and dietary restraint. More specifically, five interlocking "mediational chains" (Stice, 2001, p. 127) were proposed and supported with respect to the SPP component of the PMOBE (see Figure 2.3). (1) The link between SPP and depressive affect was fully mediated by interpersonal discrepancies; (2) the link between SPP and dietary restraint was fully mediated by interpersonal esteem; (3) the link between interpersonal discrepancies and binge eating was partially mediated by depressive affect; (4) the link between interpersonal esteem and binge eating was fully mediated by dietary restraint; and, (5) the link between SPP and binge eating was fully mediated by all four binge triggers (see Figure 2.4). Beyond these mediated effects, SPP was associated with the self-evaluative features of the PMOBE. Furthermore, the self-evaluative features of the PMOBE were related to one another and to the symptomatic features of the PMOBE. The symptomatic features of the PMOBE were also associated with binge eating.

The fully mediated structural model for the SPP component of the PMOBE was largely unchanged when neuroticism, an established predictor of binge eating and the other variables of the PMOBE (Bulik et al., 2002), was introduced as a covariate: $\chi^2(120, N = 566) = 298.13$, $p < .001$; $\chi^2/df = 2.48$; GFI = .94; CFI = .98; IFI = .98; RMSEA = .05 (90% CI: .04, .06). In fact, in the context of the PMOBE, neuroticism was unrelated to binge eating ($\beta = .00$, $p > .05$). All paths seen in Figure 2.4 were virtually unaltered when neuroticism was built into the PMOBE, except for the path between interpersonal esteem and depressive affect ($\beta = -.12$, $p > .01$). Thus, as predicted, neuroticism did little to attenuate the explanatory power of the SPP component of the PMOBE.[4]

Comparing U of S students to UBC students. A multigroup analysis tested whether the paths (i.e., the predictive relations) in the fully mediated structural model for the SPP component of the PMOBE were invariant across data collection sites. Byrne's (2001) recommendations for multigroup analysis were once again followed. A baseline model for U of S students, $\chi^2(109, N =$

[4]The fully mediated structural model for the SPP component of the PMOBE still fit the data well when demographics were added in: $\chi^2(207, N = 566) = 611.27$, $p < .001$; $\chi^2/df = 2.95$; GFI = .92; CFI = .96; IFI = .96; RMSEA = .06 (90% CI: .05, .06). Four significant relationships emerged between demographics and the PMOBE variables: age predicted interpersonal esteem ($\beta = .12$, $p < .001$), time in Canada predicted interpersonal discrepancies ($\beta = -.18$, $p < .001$), Asian ethnicity predicted SPP (Asian = 1 and all other ethnicities = 0; $\beta = .28$, $p < .001$), and BMI predicted dietary restraint ($\beta = .14$, $p < .001$). Aside from the connection between interpersonal discrepancies and dietary restraint ($\beta = .14$, $p > .01$), after demographics were incorporated into the model, all paths remained substantial and significant (as shown in Figure 4 and as described above).

178) = 168.67, $p < .001$; $\chi^2/df = 1.55$; GFI = .91; CFI = .98; IFI = .98; RMSEA = .06 (90% CI: .04, .07), and a baseline model for UBC students, $\chi^2(109, N = 388) = 225.66$, $p < .001$; $\chi^2/df = 2.07$; GFI = .94; CFI = .98; IFI = .98; RMSEA = .05 (90% CI: .04, .06), demonstrated adequate fit. Thus, the fully mediated structural model for the SPP component of the PMOBE fit the data well in both data collection sites. The equivalence of structural paths across data collection sites was evaluated next.

An unconstrained model was compared to a partially constrained model. In the partially constrained model, all factor loadings and structural paths were designated as invariant, except factor loadings for the DACL-G and the POMS-D, which were found to be noninvariant during testing of the measurement model. According to a χ^2 difference test, $\Delta\chi^2(19, N = 566) = 31.88$, $p > .05$, the partially constrained model, $\chi^2(237, N = 566) = 426.35$, $p < .001$, was not significantly different from the unconstrained model, $\chi^2(218, N = 566) = 394.47$, $p < .001$. This result indicated that the paths for the fully mediated structural model were invariant across data collection sites.

Comparing Asian Canadians to European Canadians. A multigroup analysis tested whether the paths in the fully mediated structural model for the SPP component of the PMOBE were invariant across ethnic groups. Before testing the equivalence of structural paths, baseline models were estimated for Asian Canadians, $\chi^2(109, N = 257) = 171.11$, $p < .001$; $\chi^2/df = 1.57$; GFI = .93; CFI = .99; IFI = .99; RMSEA = .05 (90% CI: .03, .06), and for European Canadians, $\chi^2(109, N = 257) = 202.75$, $p < .001$; $\chi^2/df = 1.86$; GFI = .92; CFI = .98; IFI = .98; RMSEA = .06 (90% CI: .05, .07). Results indicated that the fully mediated structural model for the SPP component of the PMOBE represented a well-fitting model in Asian Canadians and in European Canadians. Next, the invariance of structural paths across ethnicities was tested.

A partially constrained model was tested against an unconstrained model. Structural paths and factor loadings were all treated as invariant in the partially constrained model, except for factor loadings for the BIQ, APS-R, and POMS-D, which were shown to be noninvariant when evaluating the measurement model. A χ^2 difference test, $\Delta\chi^2(18, N = 566) = 26.38$, $p > .05$, suggested that the partially constrained model, $\chi^2(236, N = 566) = 400.24$, $p < .001$, and the unconstrained model, $\chi^2(218, N = 566) = 373.86$, $p < .001$, were not significantly different. Thus, the paths in the fully mediated structural model were identified as invariant across ethnic groups.

Overall, the paths of the fully mediated structural model for the SPP component of the PMOBE showed invariance across data collection sites and ethnic identities.

To summarize, although the hypothesised measurement model for the SOP component of the PMOBE did not function adequately, the hypothesised measurement model for the SPP component of the PMOBE was clearly supported. Furthermore, the hypothesised structural model for the SPP component of the PMOBE represented a well-fitting model, and analyses favoured the fully mediated version of this model. Thus, as anticipated, binge triggers accounted for the relationship between SPP and binge eating.

In addition, both the measurement and the structural model for the SPP component of the PMOBE were largely unaltered when neuroticism was included as a covariate. This finding is consistent with the expectation that the PMOBE would evidence incremental validity. The measurement model for the SPP component of the PMOBE was also largely invariant across data collection sites and ethnic groups, whereas the structural model for the SPP component of the PMOBE was completely invariant across these same sites and groups. Thus, the PMOBE appeared to generalize across data collection sites and ethnic groups in the expected manner.

Multilevel Modeling

Diary data from this study are multilevel insofar as daily assessments (i.e., level 1, within person data) are nested, or clustered, within each person (i.e., level 2, between persons data). MLM was adopted as a data analytic strategy, as it is widely used for analysis of hierarchically structured, multilevel data (Hox, 2002; see Appendix B on p. 136 for further discussion). HLM 6.0 software (Raudenbush, Bryk, & Congdon, 2004) was utilized to conduct MLM analyses. Level 1 models focused on whether daily binge triggers covaried with daily binge eating. As an example: On days when a person is experiencing increased depressive affect, does she also exhibit increased binge eating (Ong & Allaire, 2005)? Level 2 models tested whether level 1 coefficients (intercepts and slopes) covaried with between persons influences (Armeli et al., 2005). For instance: Do persons high on SOP, as opposed to persons low on SOP, experience more binge eating across days? Thus, MLM analyses simultaneously estimated between persons and within person variance so as to evaluate whether there are "relations [among]…variables within individuals over time that generalize across individuals or that relate to differences between individuals" (Tennen & Affleck, 2002, p. 613). Multilevel moderational and mediational analyses were also conducted to test whether between persons, individual difference

variables (e.g., SPP) predispose binge eating by generating and by exacerbating certain daily variables (e.g., dietary restraint).

Between Persons and Within Person Variance

As noted above, when using MLM, it is possible to partition variance into between persons variance and within person variance. Intraclass correlation coefficients in this study were significant (see Table 2.6). This suggested that there was meaningful between persons variance and within person variance in the daily portion of this study and a conventional linear regression model was not appropriate (as it cannot simultaneously account for both between persons and within person variance; Kreft & de Leeuw, 1998). Thus, a multilevel data analytic strategy was needed.

In MLM, larger percentages of between persons variance point toward greater individual differences in a given behavior (e.g., dietary restraint). Conversely, stronger situational influences are suggested by greater within person variability (Todd, Tennen, Carney, Armeli, & Affleck, 2004). Schwartz, Neale, Marco, Shiffman, and Stone (1999) proposed that a small percentage of between persons variance (roughly 10.0%) suggested a stronger situational influence, whereas a large percentage of between persons variance (roughly 50.0%) suggested a stronger dispositional influence. In this study, percentages of between persons variance ranged from 55.4% to 74.9%, suggesting that variability in diary responses was largely, but not exclusively, attributable to traitlike, individual differences (see Table 2.6). Although these results suggested that stable, dispositional influences underlie the daily variables of the PMOBE, they also indicated that a substantial amount of within person, daily variation (specifically, 25.1% to 44.6% of the total variance) was available for modeling in MLM analyses.

Multilevel Moderational Analyses Testing the PMOBE

Variance components indicated that level 1 coefficients (intercepts and slopes) displayed significant random variation. Coefficients were therefore modeled as random effects (Snijders & Bosker, 1999). Thus, intercepts and slopes for MLM analyses were permitted to vary across persons, which allowed for individual differences in estimates of within person relationships (Ong & Allaire, 2005). As suggested by Snijders and Bosker (1999) and by others (Schwartz & Stone, 1998), level 1 variables were person-mean-centered (i.e., centered about the individual's own mean), whereas level 2 variables were grand-mean-centered (i.e, centered about the group's

Table 2.6. Percentages of between persons variance and within person variance for daily variables.

Daily variables	% of between persons variance	% of within person variance
Intrapersonal discrep.	61.2%	38.8%
Interpersonal discrep.	66.0%	34.0%
Intrapersonal esteem	67.3%	32.7%
Interpersonal esteem	69.5%	30.5%
Depressive affect	55.4%	44.6%
Dietary restraint	74.9%	25.1%
Binge eating	62.4%	37.6%

Note. Percentages are based on 3509 diary responses from 566 study participants. Intrapersonal discrep. = intrapersonal discrepancies; Interpersonal discrep. = interpersonal discrepancies. The percentage of between persons variance is equivalent to the intraclass correlation coefficient (Raudenbush & Bryk, 2002). All intraclass correlation coefficients were $p < .001$.

overall mean). In predicting binge eating, MLM analyses also controlled for previous day's binge eating, resulting in a focus on change in binge eating across days. This data analytic strategy is recommended (West & Hepworth, 1991), and commonly adopted (e.g., Fals-Stewart, Leonard, & Birchler, 2005; Stone, Kennedy-Moore, & Neale, 1995), as it is a potential safeguard against autocorrelation.[5] Controlling for previous day's binge eating resulted in a possible 6 daily reports per person (as opposed to 7) and a total of 2974 daily reports (as opposed to 3509). All demographics were initially included in MLM analyses. However, only time in Canada was identified as a significant predictor, and nonsignificant demographics were omitted from MLM analyses (see Bolger and Zuckerman, 1995, p. 897). BMI, although not a significant predictor, was retained in MLM equations as prior research has suggested that it is an important correlate of binge eating (e.g., Agras, Telch, Arnow, Eldredge, & Marnell, 1997).

Moderation was evaluated utilizing the strategy first outlined by Baron and Kenny (1986) and by Aiken and West (1991) and later extended to MLM by others (Bauer & Curran, 2005; Bolger & Zuckerman, 1995). In this study, multilevel moderational analyses tested cross-level interactions (i.e., interactions between level 1 and level 2 influences). As an example: Is the relation between daily depressive affect and daily binge eating more intense in persons high on SPP, as compared to persons low on SPP? Thus, multilevel moderational analyses evaluated whether the strength or the direction of the association between daily binge triggers and daily binge eating depended upon between persons, dispositional influences (i.e., SOP and SPP). A sample equation (2.1) is now offered to illustrate how multilevel moderational analyses were modeled:

level 1 model: (2.1)

$$\text{binge eating}_{ti} = \pi_{0i} + \pi_{1i}\,(\text{previous day's binge eating}) + \pi_{2i}\,(\text{dietary restraint}) + e_{ti}$$

level 2 model:

[5]"Residuals for…observations from the same individual" (Schwartz & Stone, 1998, p. 11) may exhibit a pattern of autocorrelation, with temporally proximal observations tending to be more strongly correlated than temporally remote observations (West & Hepworth, 1991). A first-order autocorrelated error structure is most common in MLM. For example, binge eating on one day (T1) and binge eating on the next day (T1+1) may be associated within the same person (West & Hepworth, 1991). Schwartz and Stone (1998) and others (Gunthert, Cohen, & Armeli, 1999; Laurenceau, Barrett, & Rovine, 2005) assert that "an estimated autocorrelation near zero" (Schwartz and Stone 1998, p. 11) may be taken as evidence that problematic autocorrelation is not present. In this study, the following pattern of within person, first-order autocorrelation was observed: intrapersonal discrepancies (.00), interpersonal discrepancies (-.04), intrapersonal esteem, (-.04), interpersonal esteem (.04), depressive affect (.03), dietary restraint (.06), and binge eating (.06). Thus, no evidence was found to suggest that problematic within person autocorrelation was present in this study.

$$\pi_{0i} = \beta_{00} + \beta_{01} \text{ (time in Canada)} + \beta_{02} \text{ (BMI)} + \beta_{03} \text{ (SOP)} + r_{0i}$$

$$\pi_{1i} = \beta_{10} + r_{1i}$$

$$\pi_{2i} = \beta_{20} + \beta_{21} \text{ (SOP)} + r_{2i}$$

Eight multilevel moderational analyses were conducted, and only significant interactions were tabled and graphed. SOP was tested as a potential moderator of the relation between (1) intrapersonally-focused binge triggers (i.e., intrapersonal discrepancies and esteem) and binge eating (two analyses) and (2) the symptomatic features of the PMOBE and binge eating (two analyses). In addition, SPP was tested as a potential moderator of the association between (1) interpersonally-focused binge triggers (i.e., interpersonal discrepancies and esteem) and binge eating (two analyses) and (2) the symptomatic features of the PMOBE and binge eating (two analyses). Since SOP and SPP were standardized, level 2 parameters convey the change in level 1 parameters per one standard deviation increase in SOP or in SPP.

Only 1 of 8 multilevel moderational models was supported, suggesting that, for the most part, the connection between daily binge triggers and daily binge eating was not conditional upon perfectionism (see Appendix D on p. 159 for further information). However, one significant interaction was observed. As displayed in Table 2.7, time in Canada, SOP, and the cross-level interaction between dietary restraint and SOP significantly predicted binge eating. Thus, the association between dietary restraint and binge eating varied according to the level of SOP. When the dietary restraint x SOP interaction term was added to the model in Table 2.7, a small, but significant, increment in variance explained was observed, $R^2 = .001$, $\chi^2(1, N = 566) = 6.76$, $p < .01$ (Snijders & Bosker, 1999, p. 101). Thus, the interaction term contributed significantly to the prediction of binge eating above and beyond the main effects. Furthermore, Bauer and Curran's (2005) procedure for testing multilevel simple slopes indicated that the slope for persons high on SOP was significant ($B = -0.23$, $p < .001$), whereas the slope for persons low on SOP was nonsignificant ($B = -0.03$, $p > .05$). This interaction is graphed in Figure 2.5 wherein it is apparent that persons high on SOP experienced increased binge eating on days when their level of dietary restraint was low.

Three other issues warrant mention. First, the overall pattern of null and significant results observed for multilevel moderational analyses (including findings in Table 2.7 and in Figure 2.5) was virtually unchanged when neuroticism was introduced as a covariate. For

Table 2.7. Multilevel moderational analyses predicting binge eating.

Predictor	R^2	χ^2 (df)	*B*		*SE*
Intercept	.05	382.49** (11)	41.06	**	5.48
Demographics					
Time in Canada			-0.52	**	0.11
BMI			0.43		0.27
Previous day's binge eating			0.04		0.03
Dietary restraint			-0.13		0.05
SOP			3.47	**	0.77
Dietary restraint x SOP			-0.15	*	0.06

Note. Multilevel moderational analyses are based on 2974 diary responses from 566 study participants. Time in Canada = number of years spent living in Canada; SOP = self-oriented perfectionism. R^2 = the percentage of daily binge eating variance explained by the predictor block; a R^2 value in MLM is comparable to, but not identical to, an R^2 value in conventional linear regression (see Snijders & Bosker, 1999, p. 101); χ^2 = a test to determine whether the percentage of daily binge eating variance explained by the predictor block is significantly different from the null model; *B* = an unstandardized coefficient. The intercept is used to indicate whether the average level of binge eating is significantly different from zero (after controlling for the other variables in the predictor block).
*$p < .01$. **$p < .001$.

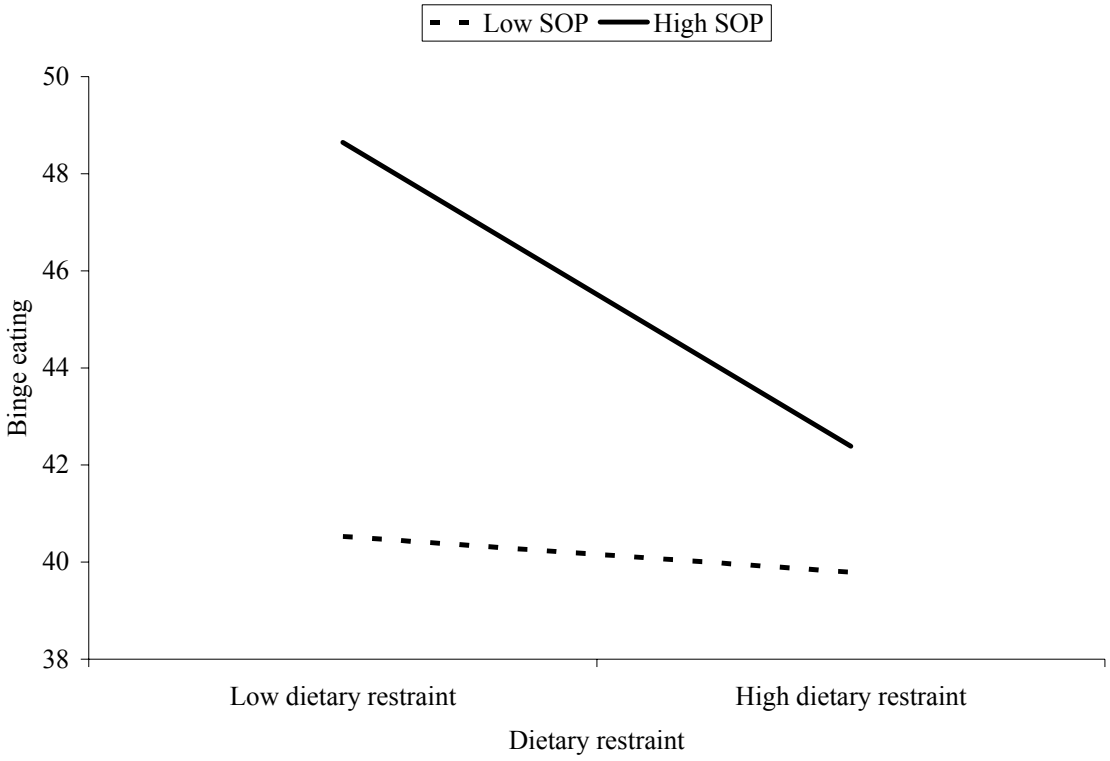

Figure 2.5 Self-oriented perfectionism (SOP) moderating the relationship between daily dietary restraint and daily binge eating. Multilevel moderational analyses are based on 2974 diary responses from 566 study participants. Low dietary restraint corresponds to the 25th percentile and high dietary restraint corresponds to the 75th percentile. Low SOP corresponds to the 25th percentile and high SOP corresponds to the 75th percentile.

example, the dietary restraint x SOP interaction term was identical with (B = -0.15, p < .01) and without (B = -0.15, p < .01) neuroticism as a covariate. Second, three-way interaction terms (e.g., dietary restraint x SOP x site), and associated two-way interaction terms (e.g. dietary restraint x site, SOP x site, and dietary restraint x SOP) were incorporated into multilevel moderational models to test whether results generalized across data collection sites (coded UBC = 0 and U of S = 1; see Appendix D on p. 159 for further information). Aside from the aforesaid dietary restraint x SOP interaction, no significant three- or two-way interaction terms were found, suggesting that findings from multilevel moderational analyses did not vary across U of S and UBC (Pedhazur, 1997). Third, two- and three-way interaction terms also tested whether multilevel moderational analyses generalized across ethnic identity (coded Asian = 0 and European = 1). No significant three- or two-way interaction terms were detected (apart from the aforesaid dietary restraint x SOP interaction), indicating that results from multilevel moderational analyses were invariant across Asian Canadians and European Canadians.[6]

In sum, little evidence was found to suggest that the relation between daily binge triggers and daily binge eating was contingent on individual differences in perfectionism. In other words, contrary to hypotheses, neither SOP nor SPP consistently magnified the connection between binge triggers and binge episodes. Multilevel moderational analyses, although unimpressive, were largely unaffected by neuroticism. This finding is congruent with the prediction that the PMOBE would display incremental validity. Lastly, multilevel moderational analyses generalized across data collection sites and ethnic identities, which is in keeping with the anticipated generalizability of the PMOBE.

Multilevel Mediational Analyses Testing the PMOBE

Mediation was tested using the framework initially discussed by Baron and Kenny (1986) and since extended to MLM by others (Kenny et al., 2003; Krull & MacKinnon, 1999, 2001). As mentioned previously, mediation is aimed at "specif[ying] how (or the mechanism by which)"

[6]Congruent with prior nomothetic research on perfectionism and disordered eating (e.g., Shaw, Stice, et al., 2004; Vohs et al., 1999), hierarchical multiple regression analyses tested whether binge triggers (aggregated across seven days) interacted with SOP or SPP to predict binge eating (aggregated across seven days). The number and the nature of hierarchical multiple regression analyses were identical to multilevel moderational analyses (see Appendix D for further information). No significant three- or two-way interactions were found, suggesting that (1) the relation between perfectionism and binge eating did not vary as a function of binge triggers and (2) the observed pattern of null findings generalized across data collection sites and ethnic identities. Null results also persisted when neuroticism was built into hierarchical multiple regression analyses as a covariate. Thus, from either a nomothetic or an idiographic perspective, moderational analyses were unimpressive in this study.

(Holmbeck, 1997, p. 599) a predictor (e.g., SOP) influences a criterion (e.g., binge eating). For example, according to the PMOBE, intrapersonal discrepancies represent "the generative mechanism through which" (Baron & Kenny, 1986, p. 1173) SOP influences binge eating.

A mediator is said to explain part of (or all of) the association between a predictor and a criterion when the following has occurred (Baron & Kenny, 1986): First, the connection between the predictor and the criterion must be significant (see Path C in Figure 2.6). Second, the relation between the predictor and the mediator must be significant (see Path A in Figure 2.6). Third, the link between the mediator and the criterion must be significant (see Path B in Figure 2.6). Fourth, the association between the mediator and the criterion must be significant after controlling for the influence of the predictor (see Path B' in Figure 2.6). Fifth, the strength of the connection between the predictor and the criterion must significantly decrease after taking into account the influence of the mediator (see Path C' in Figure 2.6). A sample equation (2.2) is now provided to show how Path C' from Figure 2.6 was modeled in multilevel medational analyses:

level 1 model: (2.2)

$$\text{binge eating}_{ti} = \pi_{0i} + \pi_{1i}\,(\text{previous day's binge eating}) + \pi_{2i}\,(\text{interpersonal esteem}) + e_{ti}$$

level 2 model:

$$\pi_{0i} = \beta_{00} + \beta_{01}\,(\text{time in Canada}) + \beta_{02}\,(\text{BMI}) + \beta_{03}\,(\text{SOP}) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + r_{1i}$$

$$\pi_{2i} = \beta_{20} + r_{2i}$$

Eight multilevel mediational models were tested. Four of these mediational models involved SOP: Namely, intrapersonal discrepancies and esteem (two analyses) and the symptomatic features of the PMOBE (two analyses) were tested as potential mediators of the SOP-binge eating relation. Four other multilevel mediational models involved SPP: Specifically, interpersonal discrepancies and esteem (two analyses) and the symptomatic features of the PMOBE (two analyses) were tested as potential mediators of the SPP-binge eating link. Only significant mediational results were tabled (see Appendix D on p. 159 for further information).

As displayed in Table 2.8, intrapersonal discrepancies (but not intrapersonal esteem) and depressive affect (but not dietary restraint) partially mediated the SOP-binge eating relation. A Sobel (1982) test indicated that intrapersonal discrepancies and depressive affect were significant mediators. Intrapersonal discrepancies and depressive affect mediated 19.4% and 8.0% of the

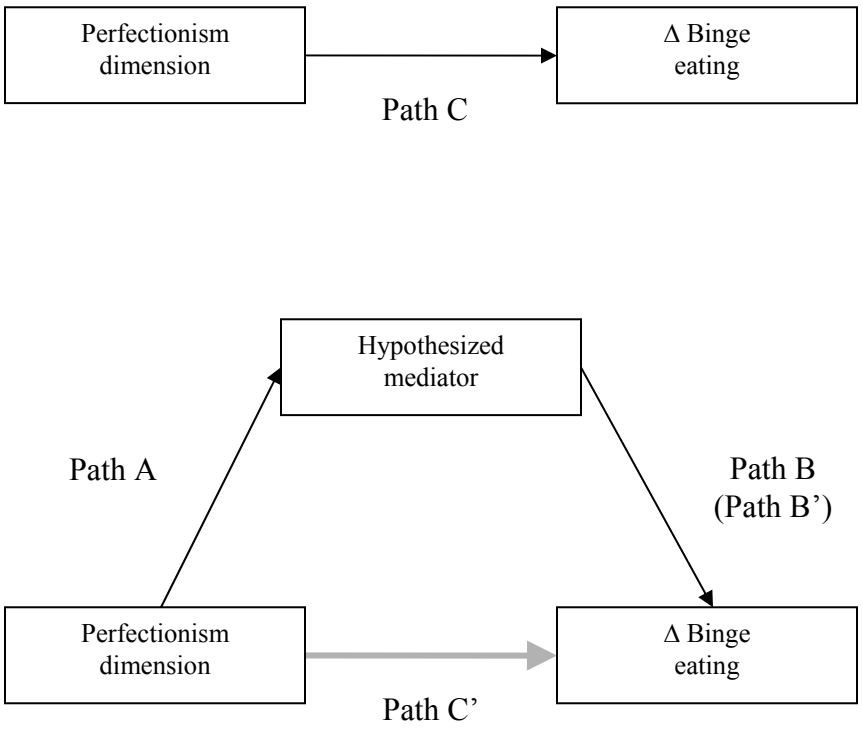

Figure 2.6 A schematic illustrating multilevel mediational analyses. For multilevel mediational analyses, rectangles represent manifest variables. Thin black arrows represent hypothesized direct effects; thick grey arrows represent mediated effects (where the hypothesized mediator was controlled for). Perfectionism dimension = either SOP or SPP.

Table 2.8. Multilevel mediational analyses involving self-oriented perfectionism.

Path	Description of Path	R^2	B	SE	Sobel (z)	Strength (%)
	Intrapersonal discrep. as a mediator					
Path C	SOP to binge eating	.05	3.51 **	0.77	--	--
Path A	SOP to intrapersonal discrep.	.06	2.43 **	0.56	--	--
Path B	Intrapersonal discrep. to binge eating	.03	0.28 **	0.04	--	--
Path B'	Intrapersonal discrep. to binge eating controlling for SOP	--	0.28 **	0.04	--	--
Path C'	SOP to binge eating controlling for intrapersonal discrep.	.06	3.26 **	0.74	3.78**	19.4
	Depressive affect as a mediator					
Path C	SOP to binge eating	.05	3.51 **	0.77	--	--
Path A	SOP to depressive affect	.04	1.04 *	0.32	--	--
Path B	Depressive affect to binge eating	.03	0.27 **	0.06	--	--
Path B'	Depressive affect to binge eating controlling for SOP	--	0.27 **	0.06	--	--
Path C'	SOP to binge eating controlling for depressive affect	.05	3.00 **	0.77	2.67*	8.0

Note. Multilevel mediational analyses are based on 2974 diary responses from 566 study participants. SOP = self-oriented perfectionism; Intrapersonal discrep. = intrapersonal discrepancies. R^2 = the percentage of level 1 variance explained by the predictor block; a R^2 value in MLM is comparable to, but not identical to, an R^2 value in conventional linear regression (see Snijders & Bosker, 1999, p. 101); B = an unstandardized coefficient; Sobel (z) = a test to determine whether the indirect effect of the predictor (e.g., SOP) on the criterion (e.g., binge eating) via the mediator (e.g., intrapersonal discrepancies) is significantly different from zero; Strength (%) = the strength of the mediated effect (e.g., intrapersonal discrepancies mediated 19.4% of the total effect of SOP on binge eating; see Shrout & Bolger, 2002, p. 434).
*$p < .01$. **$p < .001$.

total effect of SOP on binge eating, respectively (see Shrout & Bolger, 2002). Thus, considered cumulatively, binge triggers mediated 27.4% of the total effect of SOP on binge eating. Since intrapersonal esteem was unrelated to SOP (B = -0.39, p > .05) and dietary restraint was unrelated to binge eating (B = -0.13, p > .01), these variables did not mediate the SOP-binge eating connection.[7]

In addition, interpersonal discrepancies, interpersonal esteem, and depressive affect (but not dietary restraint) partially mediated the SPP-binge eating link (see Table 2.9). Sobel's (1982) test revealed that interpersonal discrepancies, interpersonal esteem, and depressive affect operated as significant mediators. Interpersonal discrepancies, interpersonal esteem, and depressive affect mediated 26.8%, 16.6%, and 14.6% of the total effect of SPP on binge eating, respectively. Thus, considered altogether, binge triggers mediated 58.0% of the total effect of SPP on binge eating. Dietary restraint did not mediate the SPP-binge eating connection, as it was unrelated to binge eating (B = -0.13, p > .01).

Three further points merit discussion. First, the overall pattern of null and significant results obtained during multilevel mediational analyses, including findings in Table 2.8 and 2.9, was virtually unaltered when neuroticism was introduced as a covariate (with one exception). In this exception, depressive affect ceased to mediate the SOP-binge eating link because Path A was nonsignificant (B = 0.49, p > .05) when neuroticism was added in as a control variable. Second, three-way (e.g., interpersonal discrepancies x SPP x site) and two-way (e.g. interpersonal discrepancies x site) interactions were again used to test whether results generalized across data collection sites. During multilevel moderational analyses, variables in Path C, B, B', and C' were established as generalizable across sites. Thus, tests of generalizability focused on Path A. No significant two-way interaction terms were found, suggesting that Path A did not differ across data collection sites. Third, no significant three-way (e.g., dietary restraint x SPP x ethnic identity) or two-way (e.g., dietary restraint x ethnic identity) interactions involving ethnicity were detected, indicating that Path A results were invariant across Asian Canadians and European Canadians.

[7]In the interest of clarity, intercepts and chi-squares for individual paths (e.g., Path C) are not shown in Table 7 or 8. Intercepts and chi-squares for all paths were significant. Statistics for demographics (i.e., time in Canada and BMI) are also omitted from Table 7 and 8. Demographics were built into tests of individual paths involved in multilevel mediational analyses (thereby following multilevel moderational analyses). B-values, p-values, and standard errors for demographics in multilevel mediational and moderational analyses were highly similar. Thus, statistics for demographics in Table 6 closely matched statistics for demographics in multilevel mediational analyses.

Table 2.9. Multilevel mediational analyses involving socially prescribed perfectionism.

Path	Description of Path	R^2	*B*	*SE*	Sobel (z)	Strength (%)
	Interpersonal discrep. as a mediator					
Path C	SPP to binge eating	.06	4.34 **	0.75	--	--
Path A	SPP to interpersonal discrep.	.17	4.65 **	0.45	--	--
Path B	Interpersonal discrep. to binge eating	.03	0.25 **	0.04	--	--
Path B'	Interpersonal discrep. to binge eating controlling for SPP	--	0.25 **	0.04	--	--
Path C'	SPP to binge eating controlling for interpersonal discrep.	.07	4.22 **	0.74	5.32**	26.8
	Interpersonal esteem as a mediator					
Path C	SPP to binge eating	.06	4.34 **	0.75	--	--
Path A	SPP to interpersonal esteem	.17	-3.78 **	0.37	--	--
Path B	Interpersonal esteem to binge eating	.02	-0.19 **	0.05	--	--
Path B'	Interpersonal esteem to binge eating controlling for SPP	--	-0.19 **	0.05	--	--
Path C'	SPP to binge eating controlling for interpersonal esteem	.06	4.25 **	0.75	3.27*	16.6
	Depressive affect as a mediator					
Path C	SPP to binge eating	.06	4.34 **	0.75	--	--
Path A	SPP to depressive affect	.09	2.35 **	0.31	--	--
Path B	Depressive affect to binge eating	.03	0.27 **	0.06	--	--
Path B'	Depressive affect to binge eating controlling for SPP	--	0.28 **	0.06	--	--
Path C'	SPP to binge eating controlling for depressive affect	.07	4.31 **	0.75	4.17**	14.6

Note. Multilevel mediational analyses are based on 2974 diary responses from 566 study participants. SPP = socially prescribed perfectionism; Interpersonal discrep. = interpersonal discrepancies. R^2 = the percentage of level 1 variance explained by the predictor block; a R^2 value in MLM is comparable to, but not identical to, an R^2 value in conventional linear regression (see Snijders & Bosker, 1999, p. 101); *B* = an unstandardized coefficient; Sobel (z) = a test to determine whether the indirect effect of the predictor (e.g., SPP) on the criterion (e.g., binge eating) via the mediator (e.g., interpersonal discrepancies) is significantly different from zero; Strength (%) = the strength of the mediated effect (e.g., interpersonal discrepancies mediated 26.8% of the total effect of SPP on binge eating; see Shrout & Bolger, 2002, p. 434).
*$p < .01$. **$p < .001$.

In summary, eight multilevel mediational models were tested and five were confirmed. Intrapersonal discrepancies and depressive affect mediated the SOP-binge eating relation, whereas interpersonal discrepancies, interpersonal esteem, and depressive affect mediated the link between SPP and binge eating. These findings offer support for the hypothesis that perfectionistic individuals render themselves susceptible to binge episodes by generating binge triggers. Binge triggers represent partial, but substantial, mediators of the perfectionism-binge eating connection that account for between 27.4% and 58.0% of the total effect of perfectionism on binge eating. With one exception, multilevel mediational models remained viable after controlling for neuroticism, thereby supporting the hypothesized pattern of incremental validity. Finally, as anticipated, multilevel mediational models indicated that the PMOBE generalized across data collection sites and ethnic identities.

The Incremental Validity of the PMOBE

Neuroticism was included as a control variable in various analyses (e.g., partial correlations and mediational analyses). With one exception (i.e., the SOP-depressive affect relation was nonsignificant after controlling for neuroticism), these analyses suggested that neuroticism did little to attenuate the explanatory power of the PMOBE and supported the hypothesis that the PMOBE would evidence incremental validity.

The Generalizability of the PMOBE

Across numerous statistical comparisons, few differences between U of S and UBC students emerged. These comparisons involved a number of different statistics (e.g., a multigroup CFA and three-way interaction terms). In fact, although 175 comparisons were conducted, only 5 significant differences emerged (see Appendix C on p. 151), and any significant differences involving the variables of the PMOBE appeared small in magnitude. Overall, these findings suggest that, with only a few minor exceptions, the hypothesis that the PMOBE would generalize across data collection sites was supported.

Few differences also emerged when Asian Canadians and European Canadians were compared. Statistical comparisons paralleled those used to test differences between data collection sites. Across 175 comparisons, only 8 significant differences were found (see Appendix C on p. 151), and any significant differences involving the variables of the PMOBE

appeared small in magnitude. Thus, as expected, the PMOBE generalized across ethnicities, with only a few small deviations from this pattern.

Discussion

The PMOBE is a novel and an integrative model relating SOP and SPP to binge eating through four binge triggers (i.e., perceived discrepancies, low self-esteem, depressive affect, and dietary restraint). Overall, the PMOBE was well-supported, with SPP emerging as especially important to our understanding of binge triggers and binge episodes (see also Pratt et al., 2001). Notably, this study confirmed a central aspect of the PMOBE: That is, in their day-to-day lives, perfectionists (especially socially prescribed perfectionists) appear to dwell in a world saturated with putative triggers of binge episodes. Although perfectionism was linked with "exposure to" binge eating triggers, by and large, it did not seem to influence "reactivity to" these same triggers (Bolger & Zuckerman, 1995, p. 890). In other words, the hypothesized moderational component of the PMOBE was not consistently observed. A somewhat qualified version of the PMOBE thus emerged, with SPP assuming greater importance than SOP and with perfectionism conferring vulnerability to binge eating by engendering environments with, but not exacerbating responses to, common triggers of binge eating. The connections predicted by the PMOBE were also found to generalize across U of S and UBC students as well as Asian Canadians and European Canadians.

The PMOBE from a Nomothetic Perspective

Vulnerabilities for binge eating are often proposed, but seldom integrated. In opposition to this general trend, the structural model for the SPP component of the PMOBE synthesized multiple vulnerabilities for binge eating into a coherent theoretical model oriented around perfectionism. As shown in Figure 2.4, SPP played a central and an organizing role in the PMOBE, driving and coordinating the constellation of cognition, affect, and behavior observed in the model. Although nomothetic hypotheses involving SEM analyses were well-supported with respect to SPP, similar hypotheses centering on SOP were not confirmed. These findings are consistent with other studies suggesting that SOP and SPP are differentially related to disordered eating (McVey et al., 2002; Sherry et al., 2004) and that SPP may be most relevant to binge eating (Pollock-BarZiv & Davis, 2005; Pratt et al., 2001), whereas SOP may be most

important to anorexia (Castro et al., 2004; Shafran et al., 2002), although this issue is far from resolved.

The relative importance of interpersonal factors in the PMOBE (i.e., SPP, interpersonal discrepancies, and interpersonal esteem) highlighted the value of considering the "self-in-relation" to others (Guisinger & Blatt, 1994, p. 107) or the "social self" (James, 1890, p. 294), as opposed to viewing the self as isolated and as autonomous. In keeping with Striegel-Moore et al.'s (1993) finding that "social-self concerns" (p. 299) are associated with bulimia, perceptions of others' views of oneself were central to the PMOBE. Furthermore, as predicted by the PMOBE, SPP appeared to underlie this tendency to be preoccupied with others' evaluations of oneself.

A picture emerged from the structural model for the SPP component of the PMOBE wherein socially prescribed perfectionists perceived other people as chronically disappointed with them and disapproving of them. If, as Moretti and Higgins (1999) argued, most individuals have an "inner audience" (p. 188) that involves intrapsychic representations of others' views and expectations, then this study suggested that individuals high on SPP dialogue with a critical and a judgmental "inner audience." From a feminist standpoint, such self-critical inner dialogue may reflect self-objectification (i.e., a woman's internalization of others', often critical, views of her; Fredrickson & Roberts, 1997). Because of their exaggerated sensitivity to others (e.g., Hewitt et al., 2006), socially prescribed perfectionists may be especially aware of, and likely to internalize, the harsh scrutiny (McKinley & Hyde, 1996) many North American females encounter in their day-to-day lives. Socially prescribed perfectionists' appraisal of their social environment as inhospitable is also consistent with recent assertions that individuals high on SPP are often disconnected from their social world (Hewitt et al., 2006). Moreover, as proposed by the PMOBE, perceptions of others as critical and as unsupportive predicted depressive affect and dietary restraint which were, in turn, related to binge eating (see caveat below).

Unexpectedly, in the context of the PMOBE, the association between depressive affect and binge eating was nonsignificant, thereby contradicting nomothetic past research (Mitchell & Mazzeo, 2004; Stice, 2002). Although a positive, moderate, and significant latent correlation between depressive affect and binge eating was observed, this connection was not reproduced in the structural model for the SPP component of the PMOBE. This finding suggested that, within

the context of a multivariate model like the PMOBE, depressive affect may not uniquely predict binge eating.

All five proposed mediated effects were supported in the fully mediated structural model for the SPP component of the PMOBE, with four of five effects being perfectly mediated. Notably, the central mediational hypothesis in the structural model for the SPP component of the PMOBE was confirmed: That is, binge triggers (i.e., interpersonal discrepancies, interpersonal esteem, depressive affect, and dietary restraint) were found to fully mediate the relationship between SPP and binge eating. Although a direct connection between SPP and binge eating is absent in Figure 2.4, this does not imply an insubstantial association between these two variables. Rather, it suggests that the SPP-binge eating link (which was established as significant and as substantial prior to introducing mediational variables) was fully accounted for by binge triggers.

Four other mediational hypotheses also received support. For example, interpersonal discrepancies were found to fully mediate the relation between SPP and depressive affect, thereby lending empirical support to the often discussed (Horney, 1950; Sorotzkin, 1985), but the seldom tested, assertion that discrepancies are centrally involved in perfectionists' susceptibility to depression. The SPP-dietary restraint link was also fully mediated by interpersonal esteem, which is congruent with the notion that women are likely to restraint their caloric intake when they feel judged by or rejected by others (Lundgren, Anderson, & Thompson, 2004; Moradi, Dirks, & Matteson, 2005). Given socially prescribed perfectionists concern over others' views of them and standards for them (Hewitt & Flett, 1991; Hewitt et al., 2006), they may be especially likely to restrain their eating in an effort to meet widely held, socially valued ideals of thinness.

In addition, the relation between interpersonal discrepancies and binge eating was partially mediated by depressive affect, suggesting that the influence of discrepancies on binge eating is transmitted, at least in part, by depressive affect. Numerous studies have connected depressive affect to binge eating (e.g., Deaver et al., 2003; Greeno et al., 2000); however, this investigation offered novel evidence in identifying interpersonal discrepancies as one possible source of binge eaters' depressive symptoms. Finally, dietary restraint was found to fully mediate the association between interpersonal esteem and binge eating. Although many investigations have either shown a link between interpersonal esteem and binge eating (e.g., Isnard et al., 2003) or found a relation between dietary restraint and binge eating (e.g., Polivy &

Herman, 1985), this study suggested that these variables may work in tandem to produce binge eating.

Beyond the aforementioned mediated effects, binge triggers were also interrelated in the manner specified in the structural model for the SPP component of the PMOBE. Interpersonal discrepancies were associated with lower interpersonal esteem, higher depressive affect, and higher dietary restraint (see Figure 2.4). These findings are in keeping with past studies highlighting the relation between interpersonal discrepancies and the aforementioned binge triggers (Hannover et al., 2006; Moretti & Higgins, 1990; Moretti, Rein, & Wiebe, 1998; Strauman et al., 1991). In particular, results suggested that seeing oneself as falling short of others' expectations undermines interpersonal esteem. Interpersonal discrepancies were also associated with depressive affect, thereby replicating past research on the emotional impact of feeling that one has failed to meet others' expectations (Moretti et al., 1998; Tangney et al., 1998). Furthermore, the connection observed between interpersonal discrepancies and dietary restraint is consistent with the notion that a hypersensitivity to or a preoccupation with others' views and expectations may drive excessive dietary restraint in women (Bruch, 1979; Striegel-Moore et al., 1993). Overall, results suggested that perceived discrepancies play a central role in the PMOBE, not only by virtue of their association with SPP, but also due to their link with other binge triggers.

Congruent with the PMOBE, lower interpersonal esteem was related to increased depressive affect and to increased dietary restraint. These results are consonant with past evidence suggesting that social disconnection is associated with depressive affect (e.g., Baumeister & Leary, 1995; Nezlek, Kowalski, Leary, Blevins, & Holgate, 1997). The link between interpersonal esteem and dietary restraint also contributed to the larger literature on social factors and eating behaviors (e.g., Striegel-Moore et al., 1993; Wilfley et al., 1997) by suggesting that women may attempt to lose weight through dietary restraint in order to gain more favorable evaluations from others.

Overall, the structural model for the SPP component of the PMOBE was clearly supported, and may be seen as a novel contribution that is indebted to, but distinct from, previous understandings of binge eating. For example, the binge triggers examined in the PMOBE are consistent with some of the binge triggers proposed in earlier models (e.g., Heatherton & Baumeister, 1991; Polivy & Herman, 1985; Vohs et al., 1999; Wilfley et al., 1997). The

PMOBE, however, distinguishes itself by synthesizing these formerly disparate risk factors (e.g., dietary restraint and interpersonal problems) into a testable theoretical model centered on perfectionism.

The PMOBE From an Idiographic Perspective

Multilevel analyses examined the manifestation of SOP and SPP over time at a micro-analytic, idiographic level, thereby providing novel evidence apart from psychology's usual mode of nomothetic investigation (Tennen & Affleck, 2002). Overall, the PMOBE appeared capable of explaining why (mediation), but not when (moderation), perfectionism is related to daily binge eating. These findings are now elaborated upon.

Perfectionism as a magnifier. The PMOBE hypothesized that SOP and SPP confer risk for binge eating by magnifying responses to binge triggers. This assertion was tested through multilevel moderational analyses. Eight multilevel interactions examined whether the connection between daily binge triggers and daily binge eating was contingent on perfectionism, and only one significant interaction was observed. Hierarchical multiple regression analyses evaluating the interaction between perfectionism and aggregated binge triggers in predicting aggregated binge eating mirrored these unimpressive findings, as no significant results were observed. This suggested that, for the most part, the relation between daily binge triggers and daily binge eating was not conditional on (or intensified by) individual differences in perfectionism.

One significant interaction was, however, observed in this study. This result should be viewed with considerable caution, since it was the only significant interaction based on eight moderational analyses and because it did not emerge in the hypothesized direction. The PMOBE predicted that an "ironic process" (Wegner, 1994, p. 34) would be observed in the above interaction, with high dietary restraint predisposing a pattern of binge eating. Instead, an opposite pattern emerged wherein individuals high on SOP experienced decreased binge eating on days when their level of dietary restraint was high (see Figure 2.5). This interaction was robust across data collection sites and ethnic groups and persisted when neuroticism was incorporated into the analyses.

The above interaction implied that, in the context of this one-week study, individuals high on SOP and on dietary restraint were reasonably successful in curtailing their binge eating. This complements findings in the perfectionism-anorexia literature, which indicate that perfectionists are capable of exerting severe levels of control over their eating patterns (Bizeul et

al., 2001; Cockell et al., 2002; Halmi et al., 2000; Toner, Garfinkel, & Garner, 1987). However, the observed interaction also indicated that, when individuals high on SOP were not actively controlling their caloric intake, binge eating occurred. Overall, this interaction suggested that individuals high on SOP, compared to individuals low on SOP, enact extreme patterns of eating behavior: either dietary restraint or binge eating. Numerous authors have suggested that such a polarized and an extreme pattern of behavior is typical of perfectionists (Brown & Beck, 2002; Rice et al., 2005). For perfectionists, it would seem to be all-or-nothing—feast-or-famine.

It is also possible that these extremes in eating behaviors may follow a cyclical pattern which was not detected given the one-week duration of this study. For example, over the span of 12 years, Tozzi et al. (2005) found evidence for a diagnostic crossover pattern in women initially diagnosed with Anorexia Nervosa who later met criteria for Bulimia Nervosa. More generally, perfectionists often engage in, or vacillate between, seemingly contradictory behavioral patterns such as relentless striving and dilatory behavior (Flett, Hewitt, Davis, & Sherry, 2004; Pacht, 1984). A pattern of goal pursuit (e.g., dietary restraint) and goal abandonment (e.g., binge eating) may be part of the ebb and the flow of perfectionistic behavior over time.

The above interaction notwithstanding, moderational findings in this study were largely unimpressive. Despite substantive theories proposing moderational models in which perfectionism and other factors (e.g., body dissatisfaction or life events) interact to produce psychopathology (e.g., bulimia or depression; Hewitt & Flett, 1993; Vohs et al., 1999), such interactional effects often fail to receive support. That is, the general lack of moderational findings in this study is congruent with past research that has not found consistent support for the interaction between perfectionism and other variables in predicting psychopathology (e.g., Enns & Cox, 2005; Enns et al., 2005; Joiner & Schmidt, 1995; Hewitt, Flett, & Ediger, 1996; Shaw, Stice, et al., 2004; Sherry et al., 2003). In fact, at present, Joiner and colleagues' three-factor interactive model of bulimia and binge eating is the only moderational model involving perfectionism to receive consistent support (Abramson et al., 2006)—and it recently failed to replicate when tested, for the first time, by an independent research group (see Shaw, Stice, et al., 2004). The disappointing moderational findings in this study are also congruent with assertions that moderational effects are extremely difficult to identify in naturalistic studies (e.g., McClelland & Judd, 1993; Pedhazur, 1982). Overall, then, these results suggested that reactivity, as understood in the PMOBE, may not be an effective explanation for the eating difficulties

experienced by perfectionistic individuals. Nevertheless, an isolated but a robust moderational finding did emerge which indicated that individuals high on SOP may exhibit extremes in their eating behaviors compared to individuals low on SOP.

Perfectionism as a generator. The PMOBE also postulated that binge triggers operate as "generative mechanism[s] through which" (Baron & Kenny, 1986, p. 1173) SOP and SPP confer risk for binge episodes. This hypothesis was evaluated via multilevel mediational analyses. In two separate analyses, intrapersonal discrepancies and depressive affect were found to partially mediate the SOP-binge eating relation. Three other multilevel mediational analyses also indicated that the link between SPP and binge eating was partially mediated by interpersonal discrepancies, interpersonal esteem, and depressive affect. Considered cumulatively, the aforementioned binge triggers explained 27.4% and 58.0% of the total influence of SOP and SPP on binge eating, respectively.

It is also noteworthy that multilevel mediational findings were generalizable and robust. With only one exception, these results were virtually unaltered (1) by the addition of two- and three-way interaction terms involving data collection sites and ethnic identities and (2) by the inclusion of neuroticism. In the aforesaid exception, the SOP→depressive affect→binge eating mediational model did not hold when neuroticism was included as a covariate (see the Incremental Validity of the PMOBE section for further discussion).

Multilevel mediational findings provided novel insight into the expression of SOP and SPP in day-to-day experience. As predicted by the PMOBE, perfectionists' lives appeared saturated with perceived discrepancies that fostered binge episodes. Specifically, intrapersonal discrepancies mediated the SOP-binge eating association, whereas interpersonal discrepancies mediated the SPP-binge eating connection. Intrapersonal and interpersonal discrepancies accounted for the largest percentage of explained mediation for SOP (19.4%) and for SPP (26.8%), respectively. This suggested that perceived discrepancies may play an important role in the relationship between perfectionism and binge eating. SOP and SPP appear to engender the sort of aversive discrepancies Higgins and colleagues saw as conducive to psychological distress (Higgins, 1987; Higgins, Bond, Klein, & Strauman, 1986). A sense of satisfaction or of self-congruence may be difficult to obtain, and even more difficult to maintain, when evaluation is occurring vis-à-vis self-generated or socially-based inflexible and perfectionistic standards (Hewitt & Flett, 2002; Sherry et al., 2005). In the face of such discrepancies, as was predicted by

the PMOBE, self-oriented and socially prescribed perfectionists appeared susceptible to binge eating.

Furthermore, idiographic evidence from this study supported interpersonal esteem as a mediator of the SPP-binge eating association, which is generally consistent with (but also appreciably different from) past nomothetic research suggesting that intrapersonal esteem is a mediator of the link between perfectionism and depression (Preusser, Rice, & Ashby, 1994). More specifically, results from this study extended Preusser et al. (1994) by (1) introducing binge eating as an criterion, (2) including a socially-based conceptualization of esteem, and (3) implicating daily, intraindividual fluctuations in esteem (as opposed to static, nomothetic levels) in the relation between perfectionism and psychopathology. Intrapersonal esteem did not mediate the SOP-binge eating link in this study, whereas Preusser et al. (1994) found that intrapersonal esteem mediated the connection between SOP and depression, suggesting a pattern of symptom specificity wherein SOP and intrapersonal esteem combine to produce depressive symptoms but not binge episodes.

Multilevel mediational findings additionally suggested that daily variability in depressive affect is instigative of binge eating among self-oriented and socially prescribed perfectionists. In keeping with Dunkley et al. (2003), this study found that depressive affect is a common (if not a ubiquitous) daily experience for perfectionists. This investigation also extended the association between perfectionism and daily depressive affect shown in Dunkley et al. (2003) by suggesting that SOP and SPP generate diurnal fluctuations in depressive affect which predispose binge episodes. Thus, although many have noted that the rigid pursuit of perfection is often followed by the experience of dysphoric emotions (Beck, 1967; Bibring, 1953; Hewitt & Flett, 1993; Pacht, 1984), the PMOBE is unique in showing that perfectionistic individuals' depressive emotions catalyse binge episodes.

Finally, dietary restraint was not significantly related to binge eating and therefore failed to mediate the connection between perfectionism and binge eating. This null result, which should be interpreted with considerable caution, is consistent with Engelberg, Gauvin, and Steiger (2005) who failed to find an association between dietary restraint and binge eating in their diary study of women with bulimia. MLM analyses showing a null dietary restraint-binge eating relation were notably different than the positive, moderate, and significant link between dietary restraint and binge eating observed in nomothetic analyses (e.g., $r = .46$, $p < .001$). In fact, in

MLM analyses, a nonsignificant trend in the opposite direction was observed (i.e., higher dietary restraint related to lower binge eating; see Table 2.7). This null finding is further complicated by SOP's role as a moderator of the dietary restraint-binge eating link (which was discussed above). The proposed association between dietary restraint and binge eating is arguably the most controversial and the least understood aspect of the PMOBE, with evidence suggesting dieting induces binge eating (Herman & Polivy, 1975), binge eating induces dieting (Stice, 1998a), dieting reduces binge eating (Presnell & Stice, 2003), and dieting is unrelated to binge eating (Engelberg et al., 2005). As suggested by this study, it is also possible that the existence of a link between dietary restraint and binge eating is conditional upon a third variable such as SOP. There is clearly much more to learn about the relation between perfectionism, dietary restraint, and binge eating, especially when examined from an idiographic perspective.

Overall, multilevel mediational analyses highlighted the multiple ways in which the expression of SOP and SPP, examined within an individual over time, fostered binge episodes via exposure to binge triggers. Multiple mediators were responsible for the impact of SOP and SPP on binge eating, suggesting that perfectionistic individuals' cumulative daily exposure to binge triggers created an environment conducive to binge eating.

Incremental Validity of the PMOBE

As predicted, across several different sets of analyses (i.e., partial correlations, SEM, and MLM), the PMOBE remained essentially unchanged when neuroticism was incorporated into the model. Given that neuroticism is associated with perfectionism (Hill et al., 1997), binge triggers (Suls & Martin, 2005), and binge eating (Rieder & Ruderman, 2001), these results supported the incremental validity of the PMOBE above and beyond an established and a stringent control variable. This study thus joins earlier investigations suggesting that perfectionism dimensions represent a unique and a specific lower-order domain of personality that is neither captured by nor redundant with broader models and measures of personality such as neuroticism (Haring, Hewitt, & Flett, 2003; Magnusson, Nias, & White, 1996; Rosser, Issakidis, & Peters, 2003; Sherry, Hewitt, et al., 2006). Findings from this study are also generally consistent with Paunonen's (1998) assertion that lower-order traits are important to the assessment and the prediction of psychological phenomena.

There was one exception to my general conclusion that the PMOBE evidenced incremental validity. Specifically, the SOP-depressive affect link was no longer significant in the

presence of neuroticism. This is consistent with work by Enns et al. (2005) and by Enns, Cox, and Inayatulla (2003), in which SOP failed to demonstrate incremental validity beyond neuroticism when predicting depression. There is a strong conceptual and empirical relation between neuroticism and depressive affect (Clark, Watson, & Mineka, 1994; Malouff, Thorsteinsson, & Schutte, 2005). In fact, Ormel, Rosmalen, and Farmer (2004) argued that neuroticism does nothing more than "measure a person's characteristic level of distress over a protracted period of time" (p. 906), such that, evidence of a connection between neuroticism and depressive affect is circular and tautological. In contrast, SOP and SPP are conceptually distinct from negative affect (Flett, Hewitt, Endler, & Bagby, 1995) and may be distinguished, on an empirical level, from neuroticism (Haring et al., 2003; Sherry, Hewitt, et al., 2006) and from depression (Cox & Enns, 2003; Hewitt, Flett, Ediger, Norton, & Flynn, 1998). It is therefore not surprising that SOP failed to predict depressive affect beyond neuroticism.

Although the incremental validity demonstrated by the PMOBE is noteworthy, there is a potential downside to utilizing neuroticism as a control variable (which is one reason why most Tables and Figures in this study presented results without neuroticism). Despite being distinguishable, perfectionism and neuroticism are overlapping (Enns, Cox, & Sareen, 2001; Hewitt, Flett, & Blankstein, 1991). As such, removing the variance associated with neuroticism may result in a form of perfectionism that is unlikely to be observed in real life (Tennen & Affleck, 2002; Tolpin, Gunthert, Cohen, & O'Neill, 2004). This is in keeping with Coyne and Gottlieb's (1996) assertion that the use of statistical controls, such as neuroticism in this study, may create variables of questionable meaning. This consideration aside, it is most important that results from this study provided strong support for the incremental validity of the PMOBE beyond neuroticism.

The Generalizability of the PMOBE

Comparisons were conducted to examine whether the PMOBE generalized across the data collection sites and the ethnic groups in this study. Results suggested that relations between variables in the PMOBE (e.g., bivariate correlations) were almost universally invariant across U of S students (in Saskatoon) and UBC students (in Vancouver).

With regard to the generalizability of the PMOBE across ethnicity, the relations specified in the PMOBE (e.g., structural paths) were almost entirely invariant across ethnic groups. Findings supported the cross-cultural generalizability of the PMOBE in terms of configural

invariance (i.e., similar measurement models) and functional equivalence (i.e., comparable structural models), with support being strongest for functional equivalence (Crockett, Randall, Shen, Russell, & Driscoll, 2005; Hui & Triandis, 1985). Such results are in keeping with studies indicating that perfectionism is linked to disordered eating in Asians (Chan & Owens, 2006; Pike & Mizushima, 2005) and in Europeans (Striegel-Moore et al., 2005; Tasca et al., 2003). Overall, findings suggested that the PMOBE generalized across Asian Canadians and European Canadians.

Contrary to the belief that eating pathology is a largely European phenomenon, there is increasing evidence suggesting that eating pathology occurs in all ethnicities (Cummins, Simmons, & Zane, 2005; Shaw, Ramirez, et al., 2004). Results from this study add to other findings showing cross-cultural similarities with respect to symptoms of eating disorders and to eating disorder risk factors (Phan & Tylka, 2006; Smith, 1995). Overall, this study contributes to evidence suggesting that risk factors for eating problems evidence "more similarities than differences" (Shaw, Ramirez, et al., 2004, p. 12) across ethnicities.

Important limitations also exist regarding my tests of the generalizability of the PMOBE across ethnic identities. First, this study used a crude, unidimensional measure of acculturation (i.e., time in Canada). There is evidence suggesting that "psychological acculturation" (p. 853) is better seen as a bidimensional phenomenon in which the old and the new culture are orthogonal constructs (Ryder, Alden, & Paulhus, 2000). Despite my simple measure of acculturation, time in Canada still played a role in the PMOBE (e.g., see Table 2.7). Such results suggest that future studies should adopt a more encompassing model of acculturation and its impact in disordered eating.

Additionally, a more finely-grained analysis of ethnicity identity is needed. The category "Asian," for example, constitutes a diverse and a heterogeneous group involving billions of individuals (Stuart, 2004). Differences may emerge when a more differentiated analysis of ethnicity is considered (e.g., Yates, Edman, & Aruguete, 2004). Cummins et al. (2005) also argue that culturally-related variables (e.g., religious beliefs) are more important than group membership (e.g., Asian vs. European Canadian) when assessing for potential differences between cultures. In sum, although this study found support for the generalizability of the PMOBE across ethnicities, additional research with more sensitive measures of culture, ethnicity, and acculturation is needed. Notwithstanding, on the basis of the evidence offered by

this study, the PMOBE appears to be a robust predictor of binge eating across two different sites and two ethnic groups. Additional limitations of and future directions for the PMOBE are now considered.

Current Limitations and Future Directions

Results from this investigation suggest possible modifications to the PMOBE. In particular, moderational analyses in this study were, almost universally, found to be lacking. Should this outcome emerge in a different sample, the notion that perfectionism is capable of magnifying the relation between binge triggers and binge episodes should be reevaluated (and perhaps revised or dropped). In addition, the pattern and the magnitude of results involving SOP were less prominent when compared to SPP. Pending replication of this general outcome in another sample, the role of SOP in the PMOBE should be reexamined and perhaps downplayed. Finally, nomothetic and idiographic analyses offered strong support for the measurement, structural, and mediational aspects of the SPP component of the PMOBE. In light of such evidence, it is suggested that these aspects of the PMOBE do not presently require revision. Additional shortcomings of and future directions for the PMOBE are now explored.

One limitation of this investigation was my use of an undergraduate sample. This study involved university students without a known diagnosis of Binge-Eating Disorder and included a focus on subclinical levels of binge eating. However, there is evidence to suggest that binge eating is a common (but perhaps decreasing; Keel, Heatherton, Dorer, Joiner, & Zalta, 2006) problem among undergraduates (Klemchuk, Hutchinson, & Frank, 1990; Kurth, Krahn, Nairn, & Drewnowski, 1995; Pyle, Halvorson, Neuman, & Mitchell, 1986; Schwitzer, Rodriguez, Thomas, & Salimi, 2001).

In addition, there is support for a dimensional model (or a continuity model) for disordered eating in general (Stice, Killen, Hayward, & Taylor, 1998; Tylka & Subich, 2003) and for binge eating in particular (Fitzgibbon, Sanchez-Johnsen, & Martinovich, 2003; Jansen, Van den Hout, & Griez, 1990). Within the dimensional model, Binge-Eating Disorder is seen as continuous with subclinical levels of binge eating. Both clinical binges and subclinical binges, for example, involve rapid consumption of food and feeling out of control. However, according to the dimensional model, persons with Eating Disorders experience a greater intensity of feelings and behaviors during a binge episode (e.g., *very* rapid consumption of food and feeling *completely* out of control) compared to persons without an Eating Disorder. The subjective

experience accompanying binge eating may thus be understood as a "matter of quantity and intensity along a continuum" (Jansen, Van den Hout, & Griez, 1990, p. 444).

Theory and evidence supporting the dimensional model highlight "the necessity of attending to individuals with intermediate levels of eating disturbance in practice [and] in research" (Tylka & Subich, 2003, p. 284). That said, the debate concerning the (dis)continuity of disordered eating is far from resolved (for evidence against the dimensional model see Gleaves, Lowe, Snow, Green, & Murphy-Eberenz, 2000; Williamson, Gleaves, & Stewart, 2005) and it remains to be seen whether findings from this study extend to individuals with Binge-Eating Disorder.

With respect to the PMOBE, there is indirect evidence suggesting that this model may generalize to individuals experiencing more severe levels of eating pathology. In general, research has shown that risk factors for subclinical levels of disordered eating operate in a manner similar to risks factors for clinical levels of disordered eating (Fitzgibbon et al. 2003; Stice et al., 1998; Stice, Ziemba, Margolis, & Flick, 1996; Tylka & Subich, 2003). More specifically, in a sample of 127 patients with Binge-Eating Disorder, Pratt et al. (2001) showed that SPP was correlated with low-self-esteem, depressive affect, and binge eating in a manner highly comparable to the results of this dissertation. Overall, then, the results found in this investigation are expected to replicate in samples of individuals diagnosed with Binge-Eating Disorder. Clearly, however, direct empirical confirmation of this hypothesis is needed. In the mean time, it is important to recognize that, in this study and in other research (e.g., Mitchell & Mazzeo, 2004), subclinical levels of binge eating are associated with psychological distress, and university students represent a large population worthy of study in their own right.

Another shortcoming of this study is that the potential influence of sexual orientation (e.g., lesbian, bisexual, and heterosexual) was not considered. For example, in the National Lesbian Health Care Survey of 1925 lesbians recruited from all 50 American states, roughly two thirds of participants indicated that they "sometimes or often overate" (Bradford, Ryan, & Rothblum, 1994, p. 236). Although this finding does not speak directly to binge eating, it does suggest that eating difficulties are common among lesbians. More specifically, Neumark-Sztainer et al. (1996) found that lesbian or bisexual status was related to increased binge eating in adolescent females with diabetes, whereas Heffernan (1996) showed that lesbian women reported elevated binge eating compared to heterosexual women. However, there is also

evidence showing that lesbian women and heterosexual women do not differ with respect to their level of binge eating (French, Story, Remafedi, Resnick, & Blum, 1996; Striegel-Moore, Tucker, & Hsu, 1990), suggesting further research on the role of sexual orientation in binge eating is needed.

This study was also limited by the fact that it was confined to women. Although both Anorexia Nervosa (with a female-to-male ratio of approximately 10-to-1) and Bulimia Nervosa (with a female-to-male ratio of approximately 8-to-1) are decidedly more common in women relative to men, Binge-Eating Disorder (with a female-to-male ratio of approximately 2-to-1) may not demonstrate a comparable gender discrepancy (Carlat & Camargo, 1991; Carlat, Camargo, & Herzog, 1997; Hoek & van Hoeken, 2003; Weltzin et al., 2005). Such data highlight the importance of studying binge eating in men and suggest the need to evaluate whether the PMOBE is generalizable to men. Given evidence showing that perfectionism is related to disordered eating in men (e.g., McCabe & Vincent, 2003; Sherry et al., 2004) and that binge triggers are associated with eating pathology in men (e.g., Tanofsky, Wilfley, Spurrell, Welch, & Brownell, 1997; Womble et al., 2001), there is reason to be cautiously optimistic that the PMOBE is applicable to men, although direct empirical confirmation of this possibility is clearly needed.

In examining the PMOBE in men, two points warrant consideration. First, assessing sexual orientation (e.g., gay vs. heterosexual) is advisable. Gay men, for example, are overrepresented in samples of men diagnosed with Eating Disorders. Although gay men comprise roughly 5.0% of the general population (e.g., Ellis, Robb, & Burke, 2005; Seidman & Rieder, 1994), they makeup 15.0% to 50.0% of men diagnosed with Anorexia Nervosa or with Bulimia Nervosa (e.g., Carlat et al., 1997; Herzog, Norman, Gordon, & Pepose, 1984). Compared to heterosexual men, gay men also appear more likely to engage in subclinical levels of eating difficulties (e.g., Russell & Keel, 2002; Yager, Kurtzman, Landsverk, & Wiesmeier, 1988), including binge eating (e.g., French et al., 1996; Neumark-Sztainer et al., 1996). Second, by contrasting the PMOBE's ability to predict drive for muscularity (i.e., "the desire to achieve an idealized, muscular body;" Morrison & Harriman, 2005; Morrison, Morrison, & Hopkins, 2003, p. 113) with the PMOBE's ability to predict binge eating behavior, the specificity of the PMOBE could be examined in men. Such a comparison may be seen as a strenuous test of the specificity of the PMOBE, as perfectionism is associated with drive for muscularity (e.g., Davis,

Karvinen, & McCreary, 2005; Ricciardelli & McCabe, 2003).

The daily process methodology adopted in this study is well-suited to providing a micro-analytic view of binge eating. By adopting a daily process method, this study extended prior research and provided a more nuanced examination of the perfectionism-binge eating nexus. There are, however, limitations associated with this methodology. First, a daily process method may not be appropriate for studying patterns of behavior, such as binge eating, which are likely to emerge over longer periods of time (e.g., months or years). It is presently unclear whether the variables of the PMOBE may influence the long-term pathogenesis of binge eating. That said, to fully understand a problem such as binge eating, one must appreciate how it unfolds and it fluctuates on a daily basis (Dunkley et al., 2003). Future research could combine a daily, micro-analytic design with a longitudinal, macro-analytic design by conducting a multilevel longitudinal study of binge eating. In such a design, after an initial daily diary phase, participants could be tracked over an extended period of time (e.g., 6 months, 12 months, etc.). Such studies could examine whether perfectionism and individual fluctuations in the self-evaluative and the symptomatic features of the PMOBE result in long-term binge eating.

Furthermore, the once-a-day, end-of-day daily process design used in this study may not represent an ideal reporting schedule. A random schedule of reports may have provided greater precision by assessing variables more frequently during the day. However, random scheduling may miss relatively infrequent events, such as binge eating (Reis & Gable, 2000). Smyth et al. (2001) suggested a combined strategy involving both event contingent sampling (requesting reports following episodes of binge eating) and random sampling (randomly spaced reports stratified throughout the day). Such an intensive reporting schedule may, however, increase participant burden. Nevertheless, such a reporting schedule represents a potential future direction for the PMOBE, since it adds greater precision to our understanding of binge eating.

Nocturnal eating may also represent a challenge for the once-a-day, end-of day design adopted in this study. There is evidence that disordered eating may take the form of night eating syndrome, which involves restricted eating during the day, particularly during the morning, and excessive eating in the evening and through the night (Geliebter, 2002; Stunkard, 1959). Although participants were asked to report on their behaviors during the past 24 hours, the timing of daily reports in this study (i.e., prior to bedtime) may be more likely to miss nocturnal

eating. Night eating syndrome is, however, rare in young women such as those involved in this study (Striegel-Moore et al., 2005).

In addition, researchers have questioned the potential for reactance and for habituation as a result of a daily process method. Although there is evidence to suggest that reactance is not problematic in diary research on disordered eating (e.g., Stein & Corte, 2003), Bolger, Davis, and Rafaeli (2003) cautioned that participants may develop a "habitual response style" (p. 592) when providing diary responses (e.g., consistently skimming over certain sections). Further research is needed to understand the potential impact of habituation on a daily process design. For instance, varying the order of questions across days may assist in minimizing the development of habitual responding.

Another shortcoming of this investigation was the small proportion of within person variability evidenced by several variables in the PMOBE, which limited the amount of idiographic variance available for modeling. This relatively small proportion of within person variability may arise from several possible sources. For instance, variables such as binge eating and dietary restraint, which displayed the highest between person variance, focused on behaviors rather than emotions or cognitions. Although this operationalization was important in distinguishing binge eating and dietary restraint from the self-evaluative and the symptomatic features of the PMOBE, the cognitive and the affective components of binge eating (e.g., pre- or post-binge cognitions or emotions) may evidence more variability than their behavioral counterparts.

In addition, the measures used to assess the PMOBE may not have been sensitive enough to detect day-to-day fluctuations. Although the measures utilized in this study were adapted from well validated assessment devices, they were not initially designed for diary studies. Further daily process research is needed to evaluate whether the variables of the PMOBE are in fact more trait-like or whether measurement and design issues may have influenced the observed variability of these constructs.

A more intensive measurement schedule may also be required to discern additional intraindividual variability. For example, recent ecological momentary assessment studies by Steiger and colleagues (Engelberg et al., 2005; Steiger et al., 2005) found within person variance in dietary restraint to represent approximately 60.0% to 65.5% of the overall variance, which is higher than the 25.1% within person variance for dietary restraint identified in this study. The

multiple and the random assessments utilized by Steiger and colleagues may have increased the within person variability observed in their studies. Alternatively, the greater within person variability found by Steiger and colleagues may be a consequence of their instrumentation. For example, Steiger et al. (2005, p. 1555) used a cognitively-based, single-item measure of dietary restraint with unknown reliability and validity (which asked the participant to rate the extent to which she "thought about restricting food intake").

The low proportion of within person variability also sheds light on the relatively small percentages of explained variance in the MLM portion of this study (see Tables 2.7-2.9). In MLM, explained variance involves the reduction of variance out of the proportion of within person variance and not out of the total variance (Affleck et al., 1999). Consideration of the amount of initial within person variance is therefore critical "to draw the correct interpretations of effect sizes" in multilevel explained variance (Affleck et al., 1999, p. 751). This study also examined change in binge eating across days, which further reduces variability. That said, the percentages of explained variance associated with MLM analyses in this investigation are consistent with previous daily studies (Armeli, Carney, Tennen, Affleck, & O'Neil, 2000; Armeli et al., 2005; Carney, Armeli, Tennen, Affleck, & O'Neil, 2000; Park, Armeli, & Tennen, 2004), especially those examining change in daily variability (Zautra, Johnson, & Davis, 2005).

The issue of variability in idiographic analyses is also related to the broader issue of range restriction, which may have influenced the results of this study. The low proportion of within person variability observed in this study may be understood as a form of range restriction. In addition, the distribution of scores for depressive affect, dietary restraint, and binge eating (see Appendix D on p. 159), as well as the means, standard deviations, and ranges for these variables (see Table 2.1), are suggestive of range restriction. Such range restriction may be understood as a byproduct of investigating a clinically-relevant phenomenon (i.e., binge eating) in a non-clinical sample (i.e., university students). That said, rates of binge eating are usually high in samples of university students (e.g., see Reagan & Hersch, 2005 and Spitzer et al., 1992 for evidence suggesting that university students binge eat more frequently than community members). This does not, however, rule out the possibility that some degree of range restriction may have impacted the results of this investigation.

Other aspects of the design of this study may also have restricted the variability in binge eating scores. For example, participants were asked to report on their binge eating over a short

and a discrete period of time (i.e., during the past 24 hours). Participants were also followed for only 7 days. This timeframe is narrower than past studies of binge eating, which have typically specified a 6-month timeframe (e.g., Stice et al., 2001), a 3-month timeframe (e.g., Thelen et al., 1991), or indicated no timeframe whatsoever (e.g., Garner et al., 1983). Thus, although the daily methodology employed in this study offered a novel and a nuanced perspective on the association between perfectionism and binge eating, the relatively narrow timeframe involved in this investigation may have reduced the variability in some of the scores.

Range restriction is likely to result in the attenuation of the magnitude of results (Cohen et al., 2003; Raju & Brand, 2003; Sackett & Yang, 2000). As noted above, the low within-person variability evidenced by some variables in the PMOBE may have restricted the percentage of explained variance in MLM. Restriction of range may also have contributed to the disappointing moderational findings observed in this study. Range restriction in variables is magnified when these variables are combined in an interaction term, thereby impacting the likelihood of finding significant results (McClelland & Judd, 1993). Finally, although range restriction may have attenuated the findings of this dissertation, it is important to note that most of the results observed in this study are in the range of a medium effect size (Cohen, 1992) and are stronger than the typical effect size found in psychological research (Hemphill, 2003).

Corrections for range restriction exist (Raju & Brand, 2003; Sackett, Laczo, & Arvey, 2002; Sackett & Yang, 2000); however, they were not employed because the measures utilized in this study are new and the population variance, which is required for all currently available range restriction corrections, is unknown. Additionally, recruiting a clinical sample for this dissertation may not have eliminated the issue of range restriction. Instead, it may have just reproduced the range restriction issue in the opposite direction! Furthermore, selecting a sample on one variable (such as high levels of binge eating), may simultaneously and indirectly impact the level and the range of other variables (e.g., high levels of depressive affect), thereby introducing a different sort of bias into the results. Overall, a promising future recruitment strategy for research on the PMOBE may be to select for individuals who, at least on occasion, binge eat. This may help to provide a more optimal range of scores on binge eating. The possible range restriction in this study also highlights the need to replicate the PMOBE in other populations.

An additional limitation of this investigation is its reliance on participant self-report. This leads to two potential drawbacks. First, evidence suggests that individuals vary in their

definitions of what constitutes binge eating (Beglin & Fairburn, 1992; LaPorte, 1997). The criteria for binge eating (i.e., *rapid* and *uncontrollable* consumption of a *large* amount of food in a *short* period of time) leave ample room for individual interpretation (Jansen et al., 1990). Although an operational definition of binge eating was provided in this study, which was based on behavior and differentiated from the subjective qualities of binge eating (e.g., sadness), it is difficult to know how participants construed this definition. Thus, participants may have been reporting on different types or degrees of binge eating. Alternative methods for assessing binge eating, including interviews (e.g., Fairburn & Cooper, 1993) and direct observation (e.g., Stice, Fisher, & Lowe, 2004), may provide a more nuanced and/or a more objective means of measuring binge eating. In addition, interview methods are compatible with daily process research; for instance, past research indicates that daily telephone interviews are a viable means of collecting daily process data (Almeida, 2005). Education on the definition of binge eating prior to data collection may also assist in reducing variability in participants' definition of binge eating (e.g., Carter, Aime, & Mills, 2001; Passi, Bryson, & Lock, 2003).

Second, even though the PMOBE examined interpersonal factors, such as social appraisals and perceptions, interpersonal variables in this study were ultimately measured in an intrapersonal manner. This study did not use reports from informants or direct observations of interpersonal interactions in assessing interpersonally-relevant constructs. Future studies should consider utilizing reports from informants to assess perfectionism (perhaps especially SPP). Previous research suggests that informant reports of personality traits provide incremental information compared to self-report (Klein, 2003; Miller, Pilkonis, & Clifton, 2005). Laboratory studies assessing interpersonal interactions (e.g., interpersonal criticism followed by observation of eating behavior) may also provide a real-time, objective assessment of interpersonal factors in binge eating, although ethical concerns and ecological validity should be taken into account (Smyth et al., 2001). Overall, future investigations examining the PMOBE should adopt a multi-method, multi-source approach to assessing interpersonal constructs, especially since interpersonal factors were identified as salient features of the PMOBE.

Overall Conclusions

Although there is a rich history of nomothetic research on perfectionism and eating pathology, to my knowledge, this is the first structured daily diary study on perfectionism and disordered eating. As such, this research provided a novel, comprehensive, and nuanced account

of the perfectionism-binge eating connection. The PMOBE evidenced both generalizability and incremental validity. By synthesizing several risk factors for binge eating into a coherent structural model oriented around perfectionism, the PMOBE also demonstrated integrative potential. On a daily level, perfectionists, especially socially prescribed perfectionists, appeared to generate triggers of binge episodes. Overall, binge triggers seem to represent a sort of friction that perfectionistic individuals generate as they move through their day-to-day lives—a sort of friction that is, over time, likely to ignite episodes of binge eating.

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CHAPTER 3
GENERAL CONCLUSION

The purpose of this general conclusion is to review the novel contribution of the PMOBE and to situate the PMOBE in the larger literature on perfectionism and eating pathology. I also consider the implications of this dissertation with respect to broader issues, such as the (mal)adaptiveness of perfectionism, the treatment of disordered eating, and models of personality and psychopathology.

On a conceptual and a methodological level, the PMOBE may be seen as extending past research on perfectionism and distress, in general, and on perfectionism and eating pathology, in particular. For instance, although perceived discrepancies, low self-esteem, depressive affect, and dietary restraint are often examined in research on perfectionism, they are usually studied apart from one another (e.g., Besser, Flett, & Hewitt, 2004; Hewitt, Flett, & Ediger, 1995; McGee, Hewitt, Sherry, Parkin, & Flett, 2005; McLaren, Gauvin, & White, 2001; references are contained in Appendix F on p. 199). In contrast, the PMOBE integrated these variables into a coherent model focused on perfectionism. This study is also distinct from much of the larger perfectionism research literature insofar as it was conducted in the context of a falsifiable, articulated theory. The PMOBE may thus be viewed as providing an integrative, theoretical framework for future research on perfectionism and eating pathology.

In addition, the PMOBE served to bring attention to binge eating as a corollary of perfectionism. To date, research has focused mainly on the role of perfectionism in anorexic and bulimic symptoms. Despite evidence that binge eating is prevalent (Spitzer et al., 1992) and is related to psychiatric distress and health problems (Bulik, Sullivan, & Kendler, 2002), it is relatively understudied. The PMOBE may be seen as beginning to fill this gap by proposing and by supporting a model of perfectionism and vulnerability factors that is related specifically to binge eating. More generally, results from this study add to a growing body of evidence suggesting that perfectionism is involved in anorexia, bulimia, *and* binge eating (Pratt, Telch, Labouvie, Wilson, & Agras, 2001; Stice, 2002).

Findings from this study also add to the larger debate on the merits of socially-based forms of perfectionism. Recently, there have been calls in the literature on perfectionism and disordered eating to return to a self-focused, intrapersonal model of perfectionism (e.g., Shafran, Cooper, & Fairburn, 2002; Shafran, Cooper, & Fairburn, 2003; for arguments against this position, see Hewitt, Flett, Besser, Sherry, & McGee, 2003). This dissertation, however, indicated that socially-based perfectionism (i.e., SPP) is relevant to binge eating. In fact, if this investigation had been conducted utilizing only an intrapersonal model of perfectionism, it would have appeared that perfectionism was largely unrelated to binge eating.

This investigation also made a unique contribution to the overall literature on eating pathology. In particular, this study is one of only two models focused on perfectionism and binge eating (see also Joiner, Heatherton, Rudd, & Schmidt, 1997; Vohs, Bardone, Joiner, & Abramson, 1999). Clearly, similarities do exist between the PMOBE and the three-factor interactive model. For instance, both models examine similar variables (e.g., perfectionism and self-esteem) in comparable populations (i.e., female university students). That being said, substantive differences exist. The three-factor interactive model is focused on moderation and is therefore aimed at explaining when binge eating is likely to be observed. The PMOBE, in contrast, supported a pattern of mediation, which explained why and how binge eating may arise. In addition, although both models focus on explaining binge eating over time, the three-factor interactive model has, thus far, examined long term changes (i.e., weeks, months, or years), whereas the PMOBE has, to date, examined the unfolding of micro-processes over a week. So far, the three-factor interactive model has also relied exclusively on the EDI-P (Garner, Olmstead, & Polivy, 1983), a 6-item measure of perfectionism with a focus on developmental history (sample EDI-P items include "As a child, I tried very hard to avoid disappointing my parents and teachers." and "My parents have expected excellence of me."), which may result in biased recall in adult participants. To date, the three-factor interactive model has also treated the EDI-P as a unidimensional scale, despite evidence that it is a multidimensional measure involving SOP and SPP (Joiner & Schmidt, 1995; Sherry, Hewitt, Besser, McGee, & Flett, 2004). Thus, despite their similarities, both models provide a different account of the way in which perfectionism is conceptualized and believed to influence eating pathology.

Finally, this study contributed unique information to both the perfectionism literature and the disordered eating literature through the use of a daily process methodology. This

investigation is one of only two studies, of which I am aware, to utilize a daily process methodology to examine the lived daily experiences of perfectionists and is one of only a handful of studies to employ a daily process methodology to examine eating pathology. Using a daily process methodology and multilevel modeling permitted the examination of unique research questions based on micro-analytic and idiographic processes, rather than the nomothetic, cross-sectional approach typically seen in research on perfectionism and disordered eating. This study also had several noteworthy methodological strengths, which distinguished it from past daily process research: (1) It employed comprehensive daily measures based on multiple items and multiple measures, which demonstrated uniformly high reliability (i.e., coefficient alphas over .90). This may be contrasted with past daily process research which has used single item measures of unknown reliability and validity or truncated response scales (e.g., Greeno, Wing, & Shiffman, 2000; Stieger et al., 2005). (2) It involved a combined strategy of MLM and SEM analyses based on daily process data permitting both a nuanced and a comprehensive examination of the data. (3) It employed an Internet-based methodology in which the date and the time could be objectively verified. (4) There was a high participation rate for the diary portion (i.e., 99.0% of participants who completed Phase 1 also participated in the diary phase and 88.6% of diaries were returned in a useable, timely fashion). Thus, this study had a solid methodological foundation upon which to base its conclusions and provided novel information on the role of perfectionism in disordered eating on a daily basis.

Having discussed the PMOBE in relation to the extant literature on perfectionism and eating pathology, several broader implications of this study are now considered.

Wider Implications of this Dissertation

Almost every perfectionism researcher has, at one time or another, commented on whether or not perfectionism is adaptive or maladaptive (e.g., Chang, Watkins, Banks, 2004; Cox, Enns, & Clara, 2002; Flett, Russo, & Hewitt, 1994; Kawamura, Hunt, Frost, & DiBartolo, 2001; Rice, Bair, Castro, Cohen, & Hood, 2003). This issue has been discussed as "positive" vs. "negative" perfectionism (e.g., Terry-Short, Owens, Slade, & Dewey, 1995), "positive achievement striving" vs. "maladaptive evaluative concerns" (e.g., Frost, Heimberg, Holt, Mattia, & Neubauer, 1993), "healthy" vs. "unhealthy" perfectionism (e.g., Bieling, Israeli, & Antony, 2003), "normal" vs. "neurotic" perfectionism (e.g., Davis, 1997), "adaptive" vs. "maladaptive" perfectionism (Enns, Cox, Sareen, & Freeman, 2001), and so on. Regardless of

terminology, there appears to be great interest in whether perfectionism is related to beneficial or to detrimental outcomes. Given the prominence of this issue in the perfectionism literature, the (mal)adaptiveness of perfectionism warrants discussion here.

Before reviewing the ways in which this study contributes to this issue, several general points relating to this topic are considered. First, in the perfectionism research literature, the term "adaptiveness" has been, for the most part, used as a descriptive label rather than as a scientific construct. In other words, in perfectionism research, little attempt has been made to operationalize, to measure, or to validate the construct of (mal)adaptiveness, even though perfectionism is commonly labeled as (mal)adaptive. In the absence of a theoretically-based and an empirically-informed conceptualization of (mal)adpativeness (if, indeed, it is possible to arrive at such a definition), it may be premature to label perfectionism as either adaptive or maladaptive. Moreover, without such a definition, value judgments and moral biases may easily influence whether or not perfectionism is seen as (mal)adaptive.

A second point related to the purported (mal)adaptiveness of perfectionism is that this issue is often approached using a narrow and a dichotomous pair of options: namely, perfectionism is either good or bad. However, the consequences of perfectionism may be conditional on many different factors. For example, the impact of perfectionism may depend on the context in which it is expressed. Striving for perfection may be functional in high school, when perfection is more readily achieved, but may be less beneficial in university, when courses become more challenging. Thus, the (mal)adpativeness of perfectionism may change as a function of the context or the environment in which perfectionism is manifested.

Third, personality traits such as perfectionism do not exist in isolation. Instead, personality traits overlap and interact with each other, which may impact the potential (mal)adaptiveness of perfectionism. Whether perfectionism is associated with detrimental outcomes may depend, in part, on other personality traits possessed by the individual. For instance, an individual high in SOP and high in agreeableness may be able to maintain harmonious interpersonal relationships, whereas an individual high in SOP and high in narcissism may frequently conflict with others. In commenting on the (mal)adaptiveness of perfectionism, few studies have considered the interplay between perfectionism and other personality traits.

Fourth, studies commenting on the (mal)adaptiveness of perfectionism have often involved cross-sectional designs and small samples. Such studies are unlikely to shed light on the potential (mal)adaptiveness of perfectionism, as they are unable to establish temporal relationships or to detect small, but potentially informative effects. Overall, then, there are several important methodological and conceptual issues in the debate over the (mal)adaptiveness of perfectionism which have yet to be resolved.

This study is able to address some of, but not all of, these issues. For example, this dissertation closely examined perfectionism in the context of daily university life, and paid particular attention to how perfectionism influences appraisals of environments. Thus, this study offered a more contextualized understanding of how perfectionism unfolds in day-to-day life. This investigation also used a large sample, which was tracked over time, thereby providing a strong foundation upon which to base any conclusions.

Overall, results from this investigation are consistent with the only other daily study of perfectionism (Dunkley et al., 2003) in suggesting that perfectionists experience conditions in their day-to-day lives that are negative and stressful. Furthermore, as in past research (e.g., Sherry et al., 2003), in this study SOP was less strongly predictive of detrimental outcomes, whereas SPP was moderately and pervasively related to negative outcomes (e.g., depressive affect and binge eating). However, it does not necessarily follow from these results that perfectionism is maladaptive.

Although many perfectionism researchers might interpret the results of this study as suggesting that perfectionism is maladaptive, this investigation was not designed, a priori, to examine the issue of adaptiveness and maladaptiveness. Instead, it was intended to examine the link between perfectionism, binge triggers, and binge eating. Thus, only a limited number of outcomes were examined, and potentially positive outcomes related to perfectionism, such as high academic achievement, were not assessed in this study. This investigation is thus slanted toward identifying the costs of perfectionism rather than the benefits, and it is not surprising that perfectionism appears maladaptive in this study.

Perhaps the best answer to the question “Is perfectionism adaptive?” is “It depends.” The consequences of perfectionism may depend on the constellation of traits, vulnerabilities, and resiliencies the individual possesses (e.g., temperament or coping strategies), on the life stressors

encountered by or generated by the individual, and on the context in which the perfectionism is expressed.

Alternatively, perfectionism is perhaps best viewed as a vulnerability factor. From this perspective, perfectionism is neither adaptive nor maladaptive, but is likely, at some point in time, to create or to magnify distress or detrimental outcomes. Conceptualizing perfectionism in this manner does not rule out either positive outcomes (e.g., high achievement) or negative outcomes (e.g., depressive episodes), but suggests that, over time, perfectionism may confer risk to adjustment difficulties and psychiatric symptoms. Thus, perfectionists' characteristic way of interpreting, behaving, and relating may allow them to achieve certain outcomes (e.g., occupational success) while, at the same time, placing them at risk for detrimental outcomes over time.

This study may also inform the treatment of binge eating. Specifically, results from this investigation suggest that perfectionism engenders binge triggers, which in turn, are associated with binge eating. This pattern highlights several possible targets in the treatment of binge eating behavior. Binge triggers (i.e., perceived discrepancies, low self-esteem, depressive affect, and dietary restraint) represent the first set of targets. Existing treatment protocols address some of these triggers. For instance, cognitive behavioral therapy (CBT) for Binge-Eating Disorder attempts to minimize the likelihood of binge eating by decreasing dietary restraint through imposing more regular eating schedules (Wilfley et al., 2002). Furthermore, CBT protocols often incorporate observation of emotions, such as depressive affect, to help patients minimize the impact of negative emotions on the tendency to engage in binge eating (Grave, 2005). Intrapersonal esteem is also frequently targeted in CBT treatment for binge eating (Fairburn, 1997; Grave, 2005). However, although this study suggested that perceived discrepancies play a central and a substantial role in binge eating, perceived discrepancies are seldom targeted in treatment models of binge eating. Thus, adding interventions to address perceived discrepancies may further enhance the effectiveness of treatments for binge eating.

Another target of treatment suggested by this study is perfectionism itself. Previous studies have documented that perfectionism may impede successful treatment for eating difficulties (e.g., Sutandar-Pinnock, Woodside, Carter, Olmsted, & Kaplan, 2003) and other forms of psychopathology (e.g., Blatt, Zuroff, Bondi, Sanislow, & Pilkonis, 1998). Thus, one impetus for addressing perfectionism may be to minimize the interference of perfectionism in

treatment. However, the results of this study suggest that perfectionism should be a specific target of treatment so as to address the underlying source of binge triggers as a means to decrease binge eating.

There are increasing attempts to address perfectionism directly in the treatment of eating problems. For example, Fairburn, Cooper, and Shafran (2003) have adjusted the standard CBT protocol for disordered eating, to expressly address perfectionistic thoughts and attitudes. Although this treatment protocol has yet to be examined under the rigorous standards of a randomized controlled trial, initial evidence suggests it decreases levels of perfectionism as well as levels of binge eating (Shafran, Lee, & Fairburn, 2004). However, the treatment model proposed by Shafran and colleagues focuses only on intrapersonal aspects of perfectionism. Thus, according to the results of this study, Shafran and colleagues' treatment model misses the aspects of perfectionism most important to fostering binge eating (i.e., the social aspects of perfectionism). Overall, addressing both self-generated and socially-based aspects of perfectionism may enhance the effectiveness of existing treatment protocols (e.g., by reducing the interference of perfectionism in treatment) and may address the underlying source of binge triggers.

The results of this study also highlight the importance of the interpersonal environment in binge eating. Therefore, a third target for treatment is to address interpersonal factors. For instance, treatment could assist individuals high in SPP to more accurately appraise their social environment and/or to locate or to negotiate more supportive interpersonal relationships.

Furthermore, this study speaks to the mechanisms potentially underlying the effectiveness of interpersonal therapy (IPT) for disordered eating. Despite the fact that it does not directly address eating behaviors, IPT is an empirically supported intervention for eating difficulties, including for Binge-Eating Disorder (Wilfley et al., 2002). IPT addresses four interpersonal issues: grief, interpersonal role disputes, role transitions, and interpersonal deficits (Birchall, 1999; Wilfley, Frank, Welch, Spurrell, & Rounsaville, 1998). Although IPT's mechanism of change is unknown, it is hypothesized that IPT may minimize the interpersonal deficits or the interpersonal conflicts individuals with Binge-Eating Disorder often report as leading to binge episodes (Fairburn, 1993, 1997). This dissertation also suggests that IPT may be effective because it addresses the interpersonal risk factors underlying binge eating. That is, this study demonstrated that binge eating is fostered by the experience of a hostile and a critical

interpersonal environment. Therefore, addressing interpersonal factors through IPT may help to minimize the experience of the sort of harsh interpersonal environment which this study suggested is conducive to binge eating. Overall, then, this dissertation provides valuable information on the possible mechanisms of current treatment models and suggests new treatment targets (e.g., SPP and perceived discrepancies) for future interventions.

This study also has implications for the understanding of how personality confers vulnerability to psychopathology. In contrast to diathesis-stress models of personality vulnerability (Blatt & Zuroff, 1992; Hewitt & Flett, 1993), where personality is seen as a stable variable that *interacts with* situational factors to produce psychopathology, this study supports a view of personality as a stable variable that *brings about* fluctuating internal and external conditions, which are, in turn, associated with psychopathology. Rather than passively reacting to their environments, individuals in this study seemed to function as "active agent[s]" (Srivastava, John, Gosling, & Potter, 2003, p. 1042), who were involved in the "selection, evocation, and manipulation" (Buss, 1987, p. 1214) of their environments. In other words, participants in this investigation appeared to generate conditions, especially interpersonal conditions, conducive to psychopathology.

Furthermore, in contrast to diathesis-stress models of personality vulnerability, which often stipulate a large, ego-involving stressor (e.g., losing a job or failing an exam) as a necessary precursor to psychopathology (e.g., Hewitt & Flett, 1993; Zuroff & Mongrain, 1987), this study suggests that relatively minor daily problems are cumulatively and insidiously conducive to psychopathology. Finally, this investigation captured only a small period in participants' lives (i.e., one week); however, the cumulative impact of the effects of perfectionism over months, years, or decades may result in vulnerability to more severe and enduring psychopathology.

This study is also consonant with conceptualizations of "active [personality] vulnerability" (Shahar & Priel, 2003, p. 200) wherein individuals are seen to generate, rather than respond to, conditions associated with psychopathology (Hewitt & Flett, 2002). Drawing on this framework, SPP appears to be involved in both the "generation of risk factors" (such as perceived discrepancies) as well as the "degeneration of protective factors" (such as intrapersonal esteem; Shahar & Priel, 2003, p. 200), which are, in turn, related to psychopathology. In particular, this dissertation suggests that perfectionists are likely to generate

negative social environments (Dunkley, Sanislow, Grilo & McGlashan, 2006; Shahar, 2004) in which they are deprived of the benefits of social relatedness and exposed to the costs of social disconnection. Overall, then, this study supports an active view of personality vulnerability, with personality engendering conditions conducive to psychopathology. Furthermore, this study demonstrates a methodological and a statistical framework capable of examining stable dispositions and fluctuating conditions brought about by stable dispositions on a daily basis.

In sum, this investigation expanded our understanding of the precipitants and the correlates of binge eating, and underscored the notion that perfectionism may play a central role in binge eating. This study also contributed to the growing research literature suggesting the importance of personality, in general, and perfectionism, in particular, in informing our understanding of eating difficulties. Overall, results of this study provided a unique perspective on the unfolding of perfectionism in day-to-day life and suggested that perfectionism may be an important vulnerability factor for binge eating.

APPENDIX A

METHODOLOGICAL CONSIDERATIONS

The methodology used in this study can be classified under the broad rubric of "daily experience research" (Reis & Gable, 2000, p. 190; references are contained in Appendix F on p. 199). Daily experience methodologies share an interest in studying everyday experience and involve "structured contemporaneous self-observation" (Reis & Gable, 2000, p. 160). That is, they involve multiple self-reports from the same participant over relatively short periods of time (e.g., days or weeks) in the participant's natural environment. Daily experience methodologies include *ecological momentary assessment* (e.g., Stone & Shiffman, 1994), *experience sampling* (e.g., Csikszentmihalyi & Larson, 1987), and the methodology used in this study, the *daily process methodology* (e.g., Tennen, Affleck, Armeli, & Carney, 2000).

Daily experience methods differ in the scheduling for reporting. As outlined by Wheeler and Reis (1991), an interval-contingent (or time-contingent) schedule requires reports from participants at pre-arranged times. Participants usually report on events or variables of interest since their last entry. A common interval-contingent timeframe is the end-of-day report. This schedule was used in the present study wherein participants were asked to complete their entries before bedtime and asked to report on their experiences during the past 24 hours (see Appendix G on p. 215). As reviewed by Reis and Gable (2000), interval-contingent data help minimize participant burden and provide data in which cyclical patterns may be analyzed. Additionally, the end-of-day report corresponds with "empirical evidence that sleep-and-awakening provides a discrete break in biological and psychological cycles" (Reis & Gable, 2000, p. 198; Williams, Suls, Alliger, Learner, & Wan, 1991). Other possible schedules include signal-contingent data, in which participants report at randomly occurring prompts about their experiences at that moment, and event-contingent data, in which participants report after certain pre-determined events have occurred. Reis and Gable (2000) suggest that event-contingent data is most appropriate for rare or infrequent events and signal-contingent data may be best for establishing the frequency of

events. As these issues were not the main research interests in this study, the interval-contingent method was arguably the most appropriate.

Daily process studies also differ in the length of the study. In this study, participants were asked to report for seven consecutive days. Consistent with recommendations by Stone, Kessler, and Haythornthwaite (1991), issues such as participant burden, the increased reliability achieved by additional entries, and statistical power, were considered in choosing the length of the study. Given that statistical power is determined more by the number of participants than by the number of entries per participant (Maas & Hox, 2005), the primary aim was to recruit more participants for fewer days rather than a few participants for more days. Having a shorter duration for the study was considered an optimal strategy so as to minimize participant burden and to maximize the ability to recruit and to retain participants. Additionally, research suggests that reliability is maximized after approximately seven reports (Epstein, 1979).

Everyday experience studies have used a variety of data collection methods, including telephone interviews (Mroczek & Almeida, 2004), palm pilots (Schwartz, Neale, Marco, Shiffman, & Stone, 1999), and paper diaries (Steiger, Gauvin, Jabalpurwala, Seguin, & Stotland, 1999). Increasingly, researchers have used the Internet for data collection in everyday experience studies (e.g., Crocker, Karpinski, Quinn, & Chase, 2003; Park, Armeli, & Tennen, 2004), which was the data collection method used in this study. The Internet provides an efficient way of recording and submitting entries (Naglieri et al., 2004). Data can be transferred electronically to a database, thereby eliminating human error in and reducing the time required for data entry. Additionally, Internet-based data collection minimizes expenses associated with paper questionnaires and palm pilots. The timing of Internet submissions can also be verified (a benefit which is discussed in greater detail below). Although the Internet has some drawbacks for certain populations (i.e., populations with little access to or expertise with the Internet), this concern was low in this study given the student sample that was recruited. That is, 87.0% of Canadians with demographics comparable to the sample in this study have Internet access at home (Statistics Canada, 2001) and Internet access is likely closer to 100.0% with undergraduate samples. Additionally, no participant indicated that lack of access to the Internet prohibited her participation. Participants were instructed in detail on how to use the web-based questionnaires prior to beginning their daily reports.

The experience of a participant in a daily process study is distinct from her experience in a typical, cross-sectional nomothetic investigation. The current study is used to illustrate this difference. Within the daily process design adopted in this study, the participant first provided demographic variables and personality ratings. Then, the next day, the participant initiated the daily phase of this study. Specifically, before bedtime, the participant filled out a web-based questionnaire concerning her experiences with binge triggers and binge eating during the past 24 hours. The following day, the participant again completed this same web-based questionnaire prior to bedtime. All told, the participant repeated this procedure for seven consecutive days. In contrast, within a typical, cross-sectional nomothetic study focusing on the same themes, the participant would provide demographic variables, personality ratings, and information on binge triggers and on binge eating at a single point in time. Thus, the daily process design adopted in this study diverges from that of a typical, cross-sectional nomothetic investigation.

There are several advantages to the daily process method, which made it an optimal methodology for this study. First, because participants are asked to record their experiences over shorter periods of time and closer to their point of occurrence, everyday experience methods minimize or eliminate potential recall biases (Tennen et al., 2000). Increasingly, research has demonstrated significant recall biases when participants are asked to recall events over long periods of time (e.g., a week or more). For example, research has demonstrated that retrospective accounts show little correspondence with data collected using everyday experience methodologies (Smith, Leffingwell, & Ptacek, 1999; Stone et al., 1998). Over longer periods of retrospective recall participants may use a variety of heuristics to generate their responses, including theories of change and stability, personal characteristics, or reconstructing the relationship between events after they have occurred (Coyne & Gottlieb, 1996; Pearson, Ross, & Dawes, 1992; Stone & Shiffman, 1994).

Second, the daily process methodology collects multiple instances of the variable or event of interest in the individual's natural environment. This serves to increase the reliability of the data as results are based on multiple instances of behavior rather than on a single isolated event (Coyne & Gottlieb, 1996; Epstein, 1979). Even when data are aggregated, as in structural equation modeling analyses, the resulting data are more reliable and less subject to retrospective contamination than data based on a solitary report. Daily process studies also emphasize capturing "life as it is lived" (Bolger, Davis, & Rafaeli, 2003, p. 579). That is, daily process data

are collected in the participant's natural environment rather than the often artificial constraints of a laboratory. This serves to increase the ecological validity of the study (Reis & Gable, 2000). This is an important consideration in eating disorders research as "eating behavior can be influenced by relatively transient emotional, psychological, and social states difficult or impossible [or unethical] to emulate in the laboratory" (Smyth et al., 2001, p. 85).

Third, because the daily process methodology provides multiple instances of experiences, these studies are better able to examine temporal patterns and to disentangle antecedents, concomitants, and consequences of events of interest (Tennen & Affleck, 2002). This is especially valuable for eating pathology research in which several models stipulate a dynamic temporal process of binge eating. For example, the restraint model of binge eating proposes that dieting "precedes and produces" (Polivy, Zeitlin, Herman, & Beal, 1994, p. 490) binge eating. Establishing a temporal relationship among the variables also serves to strengthen casual inference (Affleck, Zautra, Tennen, & Armeli, 1999).

Finally, the daily process methodology follows the same individual over time permitting within person analyses. Examining within person or idiographic effects provides novel evidence compared to psychology's usual mode of nomothetic investigation (Tennen & Affleck, 2002). Additionally, by comparing individuals to themselves, idiographic analyses eliminate between person differences that may obscure or confound the results. For example, individual differences in motivation, personality traits, and intelligence are held constant because individuals are compared to themselves rather than to others in the sample. As with establishing temporal precedence, reducing potential confounds also serves to bolster causal inferences (Tennen & Affleck, 2002).

Although the advantages of a daily process methodology make it attractive to researchers, this methodology is not without its weaknesses. The daily process methodology, like all everyday experience methods, places a significant burden on the participants as well as the researchers. For the participants, this burden involves reporting once a day for several days or multiple times over several days. For researchers, daily process studies create large data sets usually with several thousand data points that must be managed, organized, and analyzed. Researchers must also manage numerous participants over the length of the study. Perhaps most critically, researchers must attempt to minimize fatigue effects and participant withdrawal as the study progresses. Developing a personal relationship with an initial interview and/or ongoing

monitoring of the participants (e.g., daily phone or email reminders) may bolster and maintain participant commitment (Stone et al., 1991). In this study, participants were initially familiarized with the study and the research protocol individually or in small groups. They also received daily email reminders, addressed personally to each participant, to maximize participant commitment. Overall, there was a low rate of participant withdrawal in this study. One final drawback to the daily process methodology is the lack of experimental control. Although daily process studies may strengthen causal inferences, they cannot establish causality due to the lack of controlled experimental design or random assignment.

There are several ongoing debates concerning everyday experience methods that were considered in designing this study. First, there has been increasing awareness of the issue of compliance and the importance of verifying the time of entries in daily process studies (Tennen & Affleck, 2002). Stone and colleagues found that a substantial proportion of participants "hoard" or backfill their entries despite claiming to be providing their entries on time (Broderick, Schwartz, Shiffman, Hufford, & Stone, 2003; Stone, Shiffman, Schwartz, Broderick, & Hufford, 2002, p. 1193). It is therefore increasingly suggested that researchers use data collection methods in which the timing of the entries can be verified (Tennen & Affleck, 2002). In this study, the use of the Internet as a data collection method provided the means through which to verify the timing of the reports. Submissions were date and time stamped based on the time log of the server. Only reports completed "on-time" were included in the final analyses (see the Method section of the main study).

Second, given the repeated nature of everyday experience methods, researchers have questioned whether daily process studies are subject to greater reactance (e.g., Affleck et al., 1999). For example, cognitive behavioral therapy (CBT; see list of abbreviations on p. 9) often uses similar self-monitoring strategies in an attempt to induce change (e.g., Wilson & Vitousek, 1994). However, evidence suggests that reactance may not influence the results of everyday experience methodologies as much as initially thought. Several everyday experience studies found no linear changes or trends in reports over the course of the investigation (e.g., Marco, Neale, Schwartz, Shiffman, & Stone, 1999). Other studies suggest that reactance may be minimized when participants report on multiple variables and do not receive feedback on their data (Hayes & Cavior, 1980; Vuchinich, Tucker, & Harllee, 1988). In fact, this may be what distinguishes the effects of everyday experience methods from the effects of self-monitoring

used to try to induce change in CBT. That is, in CBT, self-monitoring is followed up by discussion, analysis, and consideration of alternate behavior, which does not occur in everyday experience methods. This lack of follow-up and feedback may minimize the potential for reactance. Moreover, even when CBT is paired with self-monitoring and clinician delivered feedback, le Grange, Gorin, Catley, and Stone (2001) concluded that self-monitoring is not an effective adjunct to CBT for Binge-Eating Disorder (when compared to CBT without self-monitoring and clinician delivered feedback). Finally, the use of Internet submissions, as in this study, also assists in minimizing feedback as participants cannot view their prior entries (Affleck et al., 1999).

Everyday experience methodologies are becoming increasingly common. Consideration of and attention to on-going debates concerning the optimal use of the daily process methodology informed the current study design so as to minimize the potential limitations of this methodology. The strengths of the daily process methodology make it an optimal methodology to address the research questions of this study.

APPENDIX B

STATISTICAL CONSIDERATIONS

In the following section, the data analytic strategy used in this study is elaborated upon. The two main statistical analyses utilized in this study were structural equation modeling and multilevel modeling. In addition to providing a general overview, the advantages and the limitations, current issues, and specific statistical considerations accompanying each form of analysis are discussed. Particular attention is paid to how these issues relate to this study.

Structural Equation Modeling

General Overview

Structural equation modeling (SEM) may be viewed as part of a broad class of analyses that encompass the statistics belonging to the general linear model, including multiple regression, analysis of variance (ANOVA), multivariate analysis of variance, exploratory factor analysis, and canonical correlations (Kline, 2005; references are contained in Appendix F on p. 199). More specifically, structural equation modeling is a flexible data analytic strategy that involves the analysis of covariances and that enables the testing of models such as the Perfectionism Model of Binge Eating (PMOBE). SEM allows researchers to test whether a specified group of variables define a particular construct (Schumacker & Lomax, 2004). For example, SEM was utilized to test whether the Dutch Restrained Eating Scale (van Strien, Frijters, Bergers, & Defares, 1986), the abstaining from eating subscale of the Dietary Intent Scale (Stice, 1998b), and the restraint subscale of Three-Factor Eating Questionnaire (Stunkard & Messick, 1985) define a dietary restraint construct. SEM was also used to test whether the binge subscale of the Bulimia Test-Revised (Thelen, Farmer, Wonderlich, & Smith, 1991), the binge eating items from the Eating Disorder Inventory Bulimia Subscale (Garner, Olmstead, & Polivy, 1983), and the binge eating subscale of the Eating Disorder Diagnostic Scale (Stice, Telch, & Rizvi, 2000) define a binge eating construct. In addition, utilizing SEM, it is possible to test whether

constructs are associated with one another (Schumacker & Lomax, 2004). For instance, is dietary restraint (as defined above) related to binge eating (as defined above)?

A full structural equation model consists of two parts (Byrne, 2001). The first part is the measurement model, which examines the relationship between latent variables and observed measures. Latent variables represent abstract concepts or ideas. This study examines such abstract ideas as "intrapersonal esteem" and "interpersonal discrepancies." Because these variables are abstract they cannot be directly measured. Instead, they are operationally defined and measured by observed variables (Byrne, 2001). Observed variables (also called measured, manifest, or indicator variables) are used to "define or infer the latent variable or construct" (Schumacker & Lomax, 2004, p. 3). An example of a measurement model is confirmatory factor analysis (CFA). CFA examines the association between items and the construct (i.e., the factor) they are intended to measure, based on a prior theory. CFA is appropriate when "the researcher has some knowledge of the underlying latent variable structure" (Byrne, 2001, p. 6). In contrast, an exploratory factor analysis (EFA) attempts to discover the ways in which the items are related to the constructs; a prior hypothesis of the relationship between items and constructs is not required. In this study, confirmatory factor analysis (CFA) was used to evaluate whether the measurement model for the PMOBE represented a valid construct (see Results section). In constructing a latent variable in a measurement model, Cohen, Cohen, West, and Aiken (2003) recommend the use of measures that are correlated by at least .50. Such a pattern of intercorrelation was present in this investigation. That is, the correlations among the observed variables that constitute each latent variable were moderate to strong in magnitude (see Appendix E on p. 190).

The second part of SEM is the structural model, which examines the relationship between the variables. This model consists of both exogenous (i.e., independent latent) variables and endogenous (i.e., dependent latent) variables. This model is also referred to as the "causal" model as it stipulates the direction of the relationships between variables. Figure 2 and 3 in the main study present the structural models hypothesized in this dissertation.

There are several different methods for estimating parameters in SEM, including ordinary least squares, generalized least squares, weighted least squares, asymptomatically distribution free, and maximum likelihood (ML; Kline, 2005; Schumacker & Lomax, 2004). In this investigation, SEM was conducted utilizing ML estimation and AMOS 5.0 software (Arbuckle,

2003). ML is the most commonly recommended estimation method and is an appropriate estimator when the sample size is large, the data are continuous, and multivariate normality may be assumed (see Appendix D on p. 159 for additional information on normality; Bryne, 2001; Kline, 2005). ML is an iterative process that attempts to minimize discrepancies between the observed data matrix and the proposed matrix (Kline, 2005; ML is described in more detail in the *Multilevel Modeling* section below).

One issue requiring consideration in SEM is model identification. Only a brief description is provided here based on Byrne (2001), Kline (2005), Loehlin (2004), and Schumacker and Lomax (2004). Identification concerns the issue of whether it is theoretically possible to derive a unique solution based on the data (Byrne, 2001). Identification depends on the proportion of "unknown" (i.e., free parameters) to "known" (i.e., data variances and covariances) elements in the structural model (Byrne, 2001; Loehlin, 2004). A simple example clarifies this idea. Consider the following equation: a + b = 20. Without additional information there are an infinite number of possible solutions to this equation. For instance, "a" may be equal to 10 and "b" may be equal to 10, or "a" may be 3 and "b" may be 17, and so on. However, if one variable is fixed or constrained, such as "a" is equal to 1, or if more information is available, such as a/b = 9, then a unique solution is achievable (Byrne, 2001; Kline, 2005; Schumacker & Lomax, 2004). In SEM, a model in which a unique solution is theoretically possible is considered "identified." If a unique solution to the data is not possible (i.e., there are more free parameters than there are data variances and covariances), then the model is "underidentified." Models may also be "just-identified," meaning that there are an equal number of known and unknown elements (Byrne, 2001; Loehlin, 2004). Although a unique solution is possible, this is not an ideal situation because there are no degrees of freedom and therefore the model cannot be empirically rejected (Byrne, 2001; Schumacker & Lomax, 2004). Alternatively, an "overidentified" model indicates that a unique solution is achievable and there are sufficient degrees of freedom to reject or to fail to reject the model (Byrne, 2001).

To examine whether a model is theoretically identified, the number of unknown and known elements is computed and compared (Byrne, 2001). The number of free parameters is computed based on the proposed model. In the structural model proposed in this study (see Figure 3 in the main study), there are 48 parameters to be estimated. The number of known data are equal to $p(p+1)/2$, where p is the number of observed variables (Byrne, 2001; Schumacker &

Lomax, 2004). Based on this formula, there are 153 data points in the analyses. The degrees of freedom are equal to the number of values in the variance-covariance matrix minus the number of free parameters (Schumacker & Lomax, 2004). Thus, in this study the degrees of freedom are equal to 105 and the proposed model is overidentified.

To achieve identification, the latent variables (both exogenous and endogenous) are also assigned a metric (Kline, 2005; Schumacker & Lomax, 2004). Usually this entails fixing or constraining one of the regression paths between the observed indicators and the latent construct (or factor loadings) to 1.0 (Byrne, 2001; Schumacker & Lomax, 2004). Finally, even if a model is theoretically identified, it may not be empirically identified, meaning that statistical issues (such as multicollinearity or sample size) may prevent a unique solution (Byrne, 2001; Schumacker & Lomax, 2004).

Advantages of SEM

SEM has numerous advantages, which may account for its increasing popularity. First, SEM explicitly examines the extent to which the construct of interest is being accurately measured by the observed variables (i.e., the measurement model). This allows researchers to examine and to control for measurement error. Second, SEM may result in increased generality. That is, when latent variables involve multiple operationalisations of constructs it ensures that findings are not dependent on properties of a particular observed variable (Cohen et al., 2003). Third, SEM allows the simultaneous analysis of a relational system involving numerous variables. In contrast, regression and ANOVA permit the examination of only linear, additive models. Moreover, these linear, additive models are often confined to three main variables, as in mediated multiple regression and (most instances of) moderated multiple regression. SEM, however, permits the examination of more complex and multifaceted theoretical models (Schumacker & Lomax, 2004). For example, in this study SEM was used to evaluate a model relating six variables and five mediated effects (see Figure 2 and 3 in the main study). The use of SEM to examine more complex models is a notable strength of this study, which is based on daily process data. That is, most daily process studies have used multilevel modeling, in which only additive or three variable systems are analyzed (see Dunkley, Zuroff, & Blankstein, 2003 for an exception). Fourth, SEM is model based. Researchers must specify a theoretical model prior to conducting SEM. Specifically, SEM can be used to test theoretical models, to compare alternative models in order to evaluate the best fitting model for the data, and to identify parts of

models that do not fit the data (Arbuckle, Wothke, & Raz, 2004). Fifth, SEM is less reliant on .05 statistical significance tests. That is, SEM employs a variety of fit statistics (discussed in more detail below) that assist in evaluating the model. This permits a more flexible, nuanced, and rigorous means of evaluating the results of SEM (Tomarken & Baker, 2003). "SEM [also] evaluates the entire model [and therefore] brings a higher-level perspective to the analysis" (Kline, 2005, p. 15). Sixth, SEM has become both more sophisticated and more user friendly (Schumacker & Lomax, 2004). For example, SEM can analyze more complex hypotheses such as multi-group analysis (see the Results section of the main study). In addition, newer statistical programs have made SEM (somewhat!) easier to use (Byrne, 2001).

Fit Statistics

As previously noted, structural equation models can be evaluated through fit statistics. Numerous fit statistics have been, and continue to be, developed. Kline (2005) suggests several key points in interpreting fit indices: (1) Fit indices are based on the average of the entire model. Therefore, it is possible for some parts of the model to fit well, while other parts may not. (2) There is no single "gold standard" fit index. Each fit index has different strengths and weakness and multiple fit indices should be used to evaluate a model. (3) Good fit does not mean that the model is "theoretically meaningful" (Kline, 2005, p. 134). It is possible to achieve a good fit according to the fit indices, but to have theoretically problematic aspects within the model, such as a reversal in direction of a hypothesized relationship. (4) Fit indices do not indicate predictive power. (5) Many fit indices are based on unknown distributions. As such, most criteria for establishing "good" fit are somewhat arbitrary (Hoyle & Panter, 1995). In this study, multiple fit indices were used to assess three major domains: model fit (e.g., the goodness-of-fit index), model comparison (e.g., comparison fit index), and model parsimony (e.g., incremental index of fit; Schumacker & Lomax, 2004). The fit statistics used in this study are now reviewed.

The chi-square is the most basic of the fit indices. The chi-square statistic compares the observed covariances and correlations to the predicted covariances and correlations. Based on the central chi-square distribution, $\chi^2 = 0$ indicates perfect model fit and higher values indicate a poorer fit. Failure to reject the null hypothesis indicates support for the researcher's hypothesized model. There are some significant limitations associated with relying solely on the chi-square statistic and the chi-square *p*-value to evaluate the fit of a model (Byrne, 2001; Kline, 2005; Schmacker & Lomax, 2004). The chi-square fit statistic is very sensitive to sample size, such that

with the large sample sizes required for SEM analyses, even "slight" changes can result in significant chi-square statistics and rejection of the researcher's proposed model (Kline, 2005, p. 136). It is also implausible that the model would ever "perfectly" fit the population, making the comparison to $\chi^2 = 0$ questionable. Furthermore, the chi-square statistic does not provide information on the "degree of fit" (Bagozzi, 1993, p. 840) like other available fit statistics that range from 0 to 1. Some have argued that dividing the chi-square by the degrees of freedom (i.e., the normed chi-square) may correct for chi-square inflation, with a χ^2/df in the range of 2 to 1 suggesting adequate fit (Carmines & McIver, 1981; Wheaton, Muthen, Alwin, & Summers, 1977). However, dividing the chi-square by the degrees of freedom may not completely minimize the sensitivity of the chi-square statistic to sample size (Bollen, 1989). Because of these limitations, most authors recommend the use of additional fit statistics in evaluating structural equation models (Bagozzi, 1993; Byrne, 2001; Kline, 2005). Despite its limitations, the chi-square statistic continues to be one of the most reported fit statistics in SEM studies and is the basis of numerous other fit indices (Kline, 2005). For example, the chi-square statistic, used as part of a χ^2 difference test, may be an informative statistic in the context of competitive model testing.

The goodness-of-fit index (GFI) evaluates model fit based on the amount of variance predicted. This index is similar to an R^2 statistic, but is based on the amount of variance and covariance explained by the variance-covariance matrix accompanying the model (Kline, 2005). The closer the GFI is to zero, the poorer the fit. GFI values in the range of .95 indicate good fit. The GFI is also an appropriate statistic to evaluate the same model in different subsets of data (Kline, 2005). For example, in the main study, the GFI may be utilized to evaluate the similarity of the PMOBE across data collection sites and ethnic identities.

Comparison indices, such as the comparative fit index (CFI), evaluate the incremental fit of a model relative to a baseline model (usually the independent or the null model in which the covariances are assumed to be zero in the population; Kline, 2005). The CFI is based on the normed fit index (NFI), but is preferred over the NFI because it takes into account sample size (Bentler, 1990). Reasonable fit is indicated by values in the range of .95 (Hu & Bentler, 1999). The incremental fit index (IFI) is also based on the NFI, but takes into account both the parsimony of the model and the sample size in evaluating the model. Larger values (i.e., values in the range of .95) indicate better fit (Hu & Bentler, 1999).

The root mean square error of approximation (RMSEA; Steiger & Lind, 1980) is an increasingly popular fit index for several reasons. First, the RMSEA incorporates model complexity into its evaluation, favoring more simple models when all else is equal (Kline, 2005). Second, the RMSEA is based on a non-central chi-square distribution which provides several advantages including acknowledging that "postulated models (no matter how good) can only ever fit real world data approximately" (Byrne, 2001, p. 81). Higher RMSEA values indicate poorer fit. In general, values below .05 indicate good fit, values between .05 and .08 indicate reasonable fit, and values greater than .08 indicate poor fit (Browne & Cudeck, 1993; Kline, 2005). Ninety percent confidence intervals may also be computed (Steiger, 1990). These confidence intervals may be somewhat contradictory in relation to the guidelines provided above (e.g., a 90% confidence interval may be both below .05 and above .10), especially in small samples. Such wide confidence intervals are indicative of poorer fit (MacCallum, Browne, & Sugwara, 1996). Narrow confidence intervals are more likely when the sample size is large and the number of parameters being estimated is small (Byrne, 2001).

The Akaike information criterion (AIC) and the Bayes information criterion (BIC) are predictive fit indices that are utilized to evaluate competing models involving the same sample (Kline, 2005). For example, in this dissertation, the AIC and the BIC were used to compare the partially mediated structural model for the SPP component of the PMOBE to the fully mediated model structural model for the SPP component of the PMOBE. Both the AIC and the BIC take into account the complexity or the parsimony of the model and favor simpler models. The BIC is more sensitive to the complexity of the model than is the AIC. Smaller AIC and BIC values suggest better fit as well as greater parsimony (Klein, 2005).

SEM and Mediation

This study also used SEM to conduct mediational analyses. Mediation tests whether (or the extent to which) variable z (the mediator) is capable of accounting for the influence of variable x (the predictor) on variable y (the criterion; Baron & Kenny, 1986). In other words, mediational analyses examine whether the association between x and y may be explained by z. A relationship between variables x and y must first be established before mediational analyses are conducted. To offer an example of mediation from this study, the PMOBE postulated that binge triggers would explain (or mediate) the association between socially prescribed perfectionism (SPP) and binge eating.

SEM is viewed as the preferred method to test mediation for several reasons (Baron & Kenny, 1986; Hoyle & Smith, 1994). First, SEM is capable of controlling for measurement error in mediational analyses (Baron & Kenny, 1986). This is important as the reliability of the measures impacts the ability to detect significant mediational effects. Thus, "statistical analyses, such as multiple regression, that ignore measurement error underestimate mediation effects" (Frazier, Tix, & Barron, 2004, p. 127). Second, SEM allows for the inclusion of control variables which permits direct effects to be isolated (Bollen, 1989; Hoyle & Smith, 1994). Third, using SEM, multiple mediational paths may be simultaneously examined (Baron & Kenny, 1986; Hoyle & Smith, 1994). In this study, SEM was utilized to evaluate a model that proposed five mediated effects among six variables (see Figures 2 to 4 in the main study).

Limitations of SEM

Despite its numerous advantages, SEM also has its limitations. First, SEM should not be viewed as "causal" modeling in the absence of a research design which permits such conclusions. That is, although SEM specifies directions between variables, causation may only be established through methodology (i.e., experimental control, randomization, and temporal precedence) and not statistical analyses (Hoyle & Smith, 1994). In this study, SEM analyses were not based on a randomized, experimental design and, as such, causal conclusions were not drawn. Second, SEM analyses do not identify the sole explanation for the phenomena under investigation. Even if a model fits well, it does not rule out alternative, unspecified models that may have fit better (Loehlin, 2004). For example, there may be numerous other variables that were not included in the PMOBE which may have played an important role in the phenomena under study (MacCallum, Wegener, Uchino, & Fabrigar, 1993). Thus, even if a well-fitting model is identified, it should be considered *a* model and not *the* model. Third, SEM requires large sample sizes. For instance, Kline (2005) recommends sample sizes greater than 200. MacCallum, Browne, and Sugwara (1996) also present charts to determine sample size, wherein *d*, α, power, and RMSEA are considered. For α = .05, $df = 100$, and RMESA = .05, $N = 132$ would ensure power = .80 for all goodness-of-fit indices used in this study. However, other authors recommend consideration of the complexity of the model in determining required sample size. For example, Jackson (2003) states that there should be at least 10 participants for each parameter that is estimated. Based on this recommendation, the sample size required for this study is 420. The large sample sizes required for SEM may also impact the interpretation of the

results. Because of the large sample sizes typically used, SEM may produce results that are statistically significant but trivial (Kline, 2005).

Conclusion

Given its flexibility and ability to analyze complex theoretical models such as the PMOBE, SEM was an optimal analytic technique to address certain research questions in this investigation (e.g., mediation). Current recommendations concerning the use and the interpretation of SEM were also incorporated into this study. Findings obtained utilizing SEM may be found in the Results section of the main study.

Multilevel Modeling

General Overview

Multilevel modeling (MLM) is a class of analyses designed to analyze data that have a nested or a hierarchical structure (Raudenbush & Bryk, 2002; Snijders & Bosker, 1999). Nested data are those in which the data involve more than one level. Many natural phenomena have a nested structure. Examples include students within classrooms, employees within organizations, and families within neighborhoods. Increasingly, multilevel models are also used for repeated measures designs in which multiple data points are nested within individuals (Raudenbush & Bryk, 2002). Before the development of multilevel modeling, researchers often faced (what might be called) a "unit of analysis" problem (Raudenbush & Bryk, 2002, p. 5): namely, having to choose between analyzing one level (e.g., the individual) or another level (e.g., the classroom), without being able to simultaneously analyze both. Prior data analytic strategies often failed to capture the hierarchical structure of the data and either ignored the nested structure (violating the assumption of independence) or collapsed across levels (losing variability in the data). Multilevel models are extensions of linear regression, but include ways to model multiple levels of variability. Multilevel models do so by incorporating both fixed components (coefficients) and random components (variance; Snijders & Bosker, 1999). The ability of multilevel models to handle nested data is described in greater detail below. Multilevel models are also known as hierarchical linear models, mixed-effects models, random-effects models, and random-coefficient regression models (Raudenbush & Bryk, 2002; Snijders & Bosker, 1999).

In this study, the data have the following two-level hierarchal structure: the micro-analytic level (or level 1) which involves daily variables measured during Phase 2 (e.g., daily binge eating) and the macro-analytic level (or level 2) which involves trait variables measured during Phase 1 (e.g., self-oriented perfectionism or SOP). Specifically, the data are hierarchical in that structured daily diary responses (level 1) are "nested under persons" (level 2; David & Suls, 1999, p. 278). Level 1 variables reflect "daily variation within individuals over time," whereas level 2 variables reflect "differences between individuals on average" (Bolger & Zuckerman, 1995, p. 894).

Hierarchical Linear Modeling 6.0 (HLM; Raudenbush, Bryk, & Congdon, 2004) was utilized to conduct multilevel analyses in this study. HLM uses ML as an estimator. As described by Hox (1998), ML involves an iterative process in which the "program generates reasonable starting values…often [based on ordinary least squares] estimates" (p. 149). Generalized least squares estimates are produced after the first iteration. Upon convergence, ML estimates are produced. HLM provides both full maximum likelihood (FML) and restricted maximum likelihood (RML) as options for analyses. RML is generally viewed as producing better estimates because, unlike FML, RML considers the fixed components (i.e., the regression coefficients) as "estimates" rather than as "known quantities" (Hox, 1998, p. 150; Raudenbush & Bryk, 2002). However, FML has the advantage of being able to use the log likelihood ratio test to compare nested models in which the fixed components (regression coefficients) vary. In contrast, RML may only be used to compare nested models in which only the random (variance) components vary. In this study, analyses were conducted with RML except for circumstances when nested models with varying fixed components were being compared, in which FML was an appropriate data analytic strategy (Snijders & Bosker, 1999).

Why Multilevel Modeling?

There were numerous reasons why MLM was an appropriate analytic strategy for this study. Daily diary methodologies produce hierarchically structured or nested results. That is, the data are naturally clustered with daily data nested within individuals. This clustering must be taken into account in the analyses. Failing to account for the clustering in data results in underestimation of the sampling variance and inflation of the Type I error rate (Hox, 1998). For instance, with only a small degree of clustering (e.g., an intraclass correlation of .10), the Type I error rate of .05 may inflate to as high as .29 (Hox, 1998). MLM is uniquely suited to analyze

nested or clustered data by accounting for the dependence in the data points (Raudenbush & Bryk, 2002).

Alternative methods for analyzing daily process data have significant limitations. Ordinary least squares regression and repeated-measures ANOVA produce liberal, and thus potentially spurious, results because of their failure to account for the dependence in the data (Hox, 1998; Schwartz & Stone, 1998). Furthermore, repeated-measures ANOVA usually requires balanced data, which is rarely the case in daily process data (Schwartz & Stone, 1998). Aggregation of daily data is another option for analyzing data. However, research suggests that aggregation may obscure important relationships among the variables (DeLongis, Folkman, & Lazarus, 1988). Additionally, aggregation disregards the temporal characteristics of the data thereby preventing analysis of the temporal relationships among the variables (e.g., lagged or cross-day effects; Tennen & Affleck, 1996). In contrast, MLM is capable of analyzing both within-day and cross-day effects. As such, MLM is a widely utilized and a frequently recommended data analytic strategy for daily process data (Affleck, Zautra, Tennen, & Armeli, 1999; Bolger & Zuckerman, 1995; Kreft & de Leeuw, 1998; Raudenbush & Bryk, 2002).

Advantages of MLM

In addition to being well suited to analyze nested data, MLM has other strengths. Utilizing MLM, it is possible to simultaneously estimate within person and between persons effects so as to answer the following question: "Are there relations [among]…variables within individuals over time that generalize across individuals or that relate to differences between individuals" (Tennen & Affleck, 2002, p. 613)? Affleck et al., (1999) stress the unique contribution that within person analyses can make to the understanding of phenomena such as chronic pain, coping, and disordered eating. For instance, research has demonstrated that "between-persons and within-person correlations can differ not only in magnitude but also in direction and that a statistically significant positive between-persons association can emerge when not a single individual in the group shows a positive within-person association" (Affleck et al., 1999, p. 748). Thus, within person analyses may provide unique results and/or offer clarity with regard to contradictory results in the literature (Tennen & Affleck, 2002).

Finally, multilevel analyses are also able to analyze unbalanced designs including unequally spaced data and missing data, both of which are frequently encountered in daily methodologies (the issue of missing data is discussed in more detail below). That is, repeated

data points do not need to be equally spaced across time and participants may miss daily entries and still be included in MLM analyses.

Missing Data

Given that participants are asked to report across multiple days, daily process studies often result in missing data. HLM can flexibly handle missing data so that even participants who provide only one instance of data may be included in the analysis. As described by Raudenbush and Bryk (2002), HLM does so by using precision weighting and an efficient estimation procedure (i.e., ML). The HLM program weights each participant's data by the number of entries provided. That is, participants who provide more data are weighted more heavily in the overall analysis. This is analogous to a weighted meta-analysis where studies with larger sample sizes are given greater consideration in the overall analysis. This also means that for participants who provide too few data, the mean of the group is more heavily weighted than the participant's individual score. Although it is common for daily process researchers to exclude participants with too few data points (e.g., to exclude participants who provide less than 50.0% of the scheduled number of daily responses), this practice may result in biased estimates. HLM provides accurate estimates, *only* when there is no missing data *or* all the participants are included (i.e., no participant is excluded due to missing data; for a more detailed discussion see Raudenbush & Bryk, 2002, p. 199). For this reason, in this study all participants who provided at least one day of data were included in the analyses. However, during analysis HLM drops individuals who have insufficient data to be analyzed (e.g., participants lacking two consecutive days in cross-day analyses).

Fixed vs. Random Effects in MLM

Researchers must decide whether to model effects as random or as fixed in MLM. The notion of fixed and random coefficients in MLM is similar to that in regular regression. Random coefficients imply that results generalize to a larger population of individuals beyond those in the sample (i.e., random effects; Affleck et al., 1999). Across models in this study, results indicated significant random variance in the intercepts and the coefficients. Consistent with recommendations (Snijders & Bosker, 1999), MLM analyses were thus run as random-intercept, random-coefficient models. On a conceptual level, this means that an individual regression equation with a unique intercept and slope was computed for each person (see Wampold &

Brown, 2005, p. 917). These regression equations were then utilized as the dependent variable in between persons analyses to assess whether the regression equations could be predicted by person-level variables (e.g., SOP). Although this process is described as a two-step process, it occurs simultaneously in HLM analyses (Raudenbush & Bryk, 2002).

Centering in MLM

Congruent with recommendations (Snijders & Bosker, 1999), level 1 variables were within person centered in this study. Conceptually, this is equivalent to creating variables that are relative to the individual's own mean. Level 2 variables were between persons centered, indicating that they were compared to the overall group's mean. Although, conceptually, this centering assists in interpretation, the distinction of within person and between persons variance is not orthogonal in random-intercept, random-coefficient models because some degree of within person error is captured in the between persons variance (Kreft, de Leeuw, & Aiken, 1995). Finally, for consistency and interpretability, demographic variables (e.g., ethnicity) were uncentered in multilevel models (Raudenbush & Bryk, 2002). Personality variables at level 2 were also modeled as *z*-scores to assist in interpretation.

Autocorrelation

Another issue to consider in daily process studies using MLM is autocorrelation. Because of the repeated nature of the data, residual errors in daily process data may be correlated (i.e., serial autocorrelation; Schwartz & Stone, 1998). The simplest and the most common autocorrelation structure is the first-order autoregressive error structure, or AR(1), in which days closer together in time are more strongly correlated than days further apart in time (West & Hepworth, 1991). An AR(1) value was computed for all daily variables in this investigation and was found to be minimal (i.e., ranging from $r = .00$ to $r = .06$). Consonant with recommendations (e.g., Schwartz & Stone, 1998) and with previous MLM studies involving similar AR(1) values (e.g., Gunthert, Cohen, & Armeli, 1999; Laurenceau, Barrett, & Rovine, 2005), a homogeneous and an independent error structure was utilized in this study. Previous day's binge eating was also entered as a predictor variable in all analyses in which binge eating was the outcome variable. Including the previous day's outcome variable (i.e., previous day's binge eating) as a predictor variable also controlled for the potential influence of AR(1) in MLM analyses (e.g., Fals-Stewart, Leonard, & Birchler, 2005; West & Hepworth, 1991).

Power in MLM

In general, the sample size at level 2 (i.e., the number of individual participants) has a greater influence on power than the number of observations per person at level 1 (i.e., the number of diary entries per person; Maas & Hox, 2005; Snijders & Bosker, 1999). Based on simulation studies, Maas and Hox (2005) recommended samples sizes of over 100 at level 2. They also found that as little as five observations per person at level 1 resulted in accurate estimates, provided that the sample size at level 2 was greater than 100. Snijders and Bosker (1999) stated that sample sizes required at level 2 are "at least as stringent as requirements on the sample size in a single level design" (p. 140) with the same number of predictors. Recommendations from Green (1991) on samples sizes for single level regression suggested consideration of effect size, power, alpha, and number of predictors. MLM analyses ranged from 3 to 10 predictors. For a medium effect size, with $\alpha = .05$ and power = .80, analyses with three predictors would require $N = 73$ and analyses with ten predictors would require $N = 119$ (Green, 1991). The sample size in this study ($N = 566$) clearly exceeded recommendations for adequate power for MLM.

Moderation in MLM

Although moderation in MLM is conceptually similar to moderation in multiple regression, multilevel moderation requires distinct analytic strategies compared to moderation in multiple regression. In this study, multilevel moderation analyses examined the moderating effect of personality (e.g., SOP) on the relation between daily binge triggers (e.g., intrapersonal esteem) and daily binge eating. To conduct multilevel moderational analyses, personality, demographic, and predictor variables (e.g., intrapersonal esteem) were modeled onto the intercept. Conceptually, this may be understood as modeling the main effects of personality, demographic, and predictor variables on the dependent variable (i.e., binge eating). As noted above, previous day's binge eating was also included as a control variable. Personality variables were also modeled onto the slope of the predictor variable (e.g., intrapersonal esteem). This created an interaction term that involved both a level 1 predictor (e.g., intrapersonal esteem) and a level 2 predictor (e.g., SOP), thereby creating a cross-level interaction (Snijders & Bosker, 1999). Lastly, multilevel simple slopes analyses were conducted consistent with Bauer and Curran (2005) and Curran, Bauer and Willoughby (in press).

Mediation in MLM

Mediation in MLM is conducted in a manner similar to mediation in multiple regression. However, specific recommendations for multilevel mediation have been made to account for the unique statistical properties of multilevel models. In this study, multilevel mediational analyses followed guidelines offered by Krull and MacKinnon (1999, 2001). Consistent with recommendations for multilevel mediational analyses, all steps of the mediation models were run in HLM and the multilevel standard error was used in calculating of Sobel test (which is utilized to evaluate the significance of the mediator; Sobel, 1982).

Limitations of MLM

Although there are numerous advantages to using MLM as a data analytic strategy, there are also some drawbacks. First, HLM does not produce standardized regression coefficients; only unstandardized regression coefficients are computed. As such, regression coefficients based on variables in different metrics cannot be directly compared to assess their relative influence on the dependent variable. Second, HLM cannot account for autocorrelation structures within the data analysis when missing data is present (Raudenbush et al., 2004). Although the simplest and the most likely autocorrelation structure (i.e., AR[1]; West & Hepworth, 1991) was found to be minimal in this study and was also controlled for, more complicated autocorrelation structures could not be accounted for in MLM analyses. Third, HLM assumes no measurement error. That is, HLM does not take measurement error into account in the analyses. Finally, although a unique slope was computed for each individual in MLM analyses, the linearity of the slope must be the same for all participants. In other words, once the shape of the slope is decided (i.e., linear, quadratic, etc.), this shape is fixed for all participants.

Conclusion

MLM has several features which were indispensable in order to appropriately analyze the nested data in this study. Although MLM is not without its limitations, in this investigation consideration of ongoing issues informed the use of MLM so as to minimize these shortcomings. Results of MLM analyses are presented in the Results section of the main study.

APPENDIX C

COMPARING UNIVERSITY OF SASKATCHEWAN STUDENTS TO UNIVERSITY OF BRITISH COLUMBIA STUDENTS AND COMPARING ASIAN CANADIANS TO EUROPEAN CANADIANS

In this appendix, comparisons between (1) University of Saskatchewan (U of S) students and University of British Columbia (UBC) students and (2) Asian Canadians and European Canadians are presented. Greater detail on these analyses may be found in the Results section of the main study. The results presented here are condensed and meant to provide a summary.

The final sample in this study consisted of 566 female undergraduates. Of these students, 178 (31.4%) were from U of S and 388 (68.6%) were from UBC. The U of S sample included 12 Asian Canadians and 156 European Canadians, whereas the UBC sample included 245 Asian Canadians and 101 European Canadians. Thus, 95.3% (245 of 257) of Asian Canadian participants were from UBC, suggesting that data collection sites and ethnic identities overlapped.

Comparing U of S Students to UBC Students

Means, standard deviations, and ranges for U of S students and for students from UBC are presented in Table C1 where it may be seen that means for U of S students closely matched means for UBC students, with means from both schools falling with one standard deviation of each another.

Numerous statistics were also employed to examine potential differences between students from U of S and students from UBC. These results are described briefly below and summarized in Table C3.

ANOVAs focusing on demographic variables suggested that U of S students were significantly higher than students from UBC with respect to time in Canada and BMI (see Table C3). These differences in demographics were moderate to large in magnitude.

Comparisons of bivariate correlations for U of S and UBC students found 1 significant difference out of 45 contrasts (see Table C3). Comparisons of 36 partial correlations revealed 0 significant differences across data collection sites. The results of partial correlations complemented the findings of bivariate correlations in suggesting that, almost without exception, correlational findings generalized across data collection sites.

A multigroup CFA tested whether the factor loadings associated with the measurement model for the SPP component of the PMOBE were invariant across U of S students and UBC students. A series of follow-up χ^2 difference tests identified 2 significant differences out of 17 comparisons (see Table C3). However, these differences are not necessarily meaningful. Multigroup CFA has been criticized for being an overly sensitive and a potentially unstable procedure (see Byrne, 2001, p. 174; Byrne, Shavelson, & Muthen, 1989, p. 462; references are contained in Appendix F on p. 199). Thus, with two minor exceptions, the measurement model for the SPP component of the PMOBE was invariant across data collection sites.

A multigroup analysis also tested whether the paths (i.e., the predictive relations) in the fully mediated structural model for the SPP component of the PMOBE were invariant across data collection sites. Out of the 10 paths stipulated in the model, 0 significant differences were observed (see Table C3). This result indicated that the paths for the fully mediated structural model were invariant across data collection sites.

The generalizability of MLM results was also examined. Multilevel moderational analyses were first considered. Three-way interaction terms (e.g., dietary restraint x SOP x site) and associated two-way interaction terms (e.g., dietary restraint x site, SOP x site, and dietary restraint x SOP) were incorporated into multilevel moderational models to test whether results generalized across data collection sites. No changes from the original findings were identified and no significant two- or three-way interaction terms involving data collection sites were observed (see Table C3). This suggested the multilevel moderational analyses generalized across U of S and UBC students.

Next, the generalizability of multilevel mediational analyses was examined. Multilevel moderational analyses established that the variables in Path B, C, B', and C' generalized across data collection sites. Thus, tests of the generalizability of multilevel mediational analyses focused on Path A. Two-way interaction terms were added to Path A in multilevel mediational

analyses. No significant interactions were observed, suggesting that Path A did not differ across data collection sites (see Table C3).

Overall, very few differences between students from U of S and students from UBC were identified.

Comparing Asian Canadians to European Canadians

Means, standard deviations, and ranges for Asian Canadians and for European Canadians are exhibited in Table C2 where it may be seen that means for Asian Canadians closely matched means for European Canadians, with means from both ethnic groups falling within one standard deviation of each another.

Possible differences between Asian Canadians and European Canadians were also examined using multiple statistics. A summary of the results is provided below and presented in Table C4. Comparisons between ethnicities followed the same data analytic strategy as comparisons between data collection sites.

ANOVAs focusing on demographic variables suggested that European Canadians were significantly higher than Asian Canadians with respect to age, time in Canada, and BMI (see Table C4). These differences in demographics were small to large in magnitude.

Comparisons of 45 bivariate correlations revealed only 1 significant difference between Asian Canadians and European Canadians (see Table C4). When partial correlations were examined, only 1 significant difference was detected out of 36 comparisons. These results suggested that, almost without exception, correlational findings generalized across ethnic identity.

A multigroup CFA also tested whether the factor loadings associated with the measurement model for the SPP component of the PMOBE were invariant across ethnicities. Three discrepancies were observed out of 17 comparisons (see Table C4). Such differences suggest that three manifest variables in the PMOBE were stronger indicators of their latent constructs in one group (e.g., Asians) as compared to another group (e.g., Europeans). Overall, the factor loadings associated with the measurement model for the SPP component of the PMOBE were largely invariant across ethnicities.

Furthermore, a multigroup analysis tested whether the paths (i.e., the predictive relations) in the fully mediated structural model for the SPP component of the PMOBE were invariant across ethnicities (see Table C4). No significant differences were observed. Thus, the paths of

the fully mediated structural model for the SPP component of the PMOBE showed invariance across Asian Canadians and European Canadians.

Next, MLM analyses examined potential differences between Asian Canadians and European Canadians. Three- and two-way interaction terms involving ethnicity were added to multilevel moderational analyses to test the generalizability of findings across ethnic groups. No significant three- or two-way interaction terms were detected (apart from the original dietary restraint x SOP interaction), indicating that results from multilevel moderational analyses were invariant across ethnicities.

The generalizability of variables in Path B, C, B', and C' was established in the multilevel moderational analyses. Consequently, tests of the generalizability of multilevel mediational analyses focused on Path A. Two-way interaction terms were added to Path A in multilevel mediational analyses. No significant two-way (e.g., depressive affect x ethnicity) interactions involving ethnicity were detected, indicating that Path A results were invariant across Asian Canadians and European Canadians.

Overall, very few differences between Asian Canadians and European Canadians were identified.

Table C1. U of S students relative to UBC students.

Manifest variables	U of S (N = 178)				UBC (N = 388)			
	M	*SD*	Possible Range	Actual Range	*M*	*SD*	Possible Range	Actual Range
SOP								
HFMPS-SOP	73.72	13.67	15-105	38-102	72.17	13.86	15-105	25-104
EDI-SOP	11.78	2.81	3-18	6-18	11.81	2.92	3-18	4-18
FMPS personal standards	14.07	2.72	4-20	4-20	14.15	2.89	4-20	5-20
SPP								
HFMPS-SPP	52.46	13.45	15-105	21-80	53.16	12.48	15-105	19-92
EDI-SPP	12.42	2.85	3-18	6-18	12.78	2.76	3-18	3-18
FMPS interpersonal perceptions	8.53	3.45	4-20	4-19	9.29	3.41	4-20	4-19
Neuroticism	24.58	5.73	8-40	12-38	25.75	6.05	8-40	10-39
Intrapersonal discrep.								
MDI global intrapers. discrep.	9.10	2.40	5-20	5-17	9.73	2.75	5-20	5-18
BIQ appear. intrapers. discrep.	20.42	6.46	5-35	5-35	20.94	6.58	5-35	5-34
APS-R global intrapers. discrep.	13.94	4.58	4-28	4-24	15.07	4.72	4-28	4-26
Interpersonal discrep.								
MDI global interpers. discrep.	7.43	2.09	5-20	5-15	7.91	2.47	5-20	5-17
BIQ appear. interpers. discrep.	17.60	5.70	5-35	5-35	18.29	5.75	5-35	5-35
APS-R global interpers. discrep.	10.99	3.96	4-28	4-21	11.94	4.35	4-28	4-25
Intrapersonal esteem								
RSES self-esteem	21.28	3.81	4-28	12-28	20.85	4.43	4-28	7-28
SSES performance self-esteem	13.97	2.58	4-20	6-20	13.28	3.03	4-20	4-20
Interpersonal esteem								
JFFIS social self-esteem	19.56	5.07	4-28	6-28	17.96	5.28	4-28	4-28
SSES social self-esteem	15.25	3.17	4-20	6-20	14.31	3.57	4-20	4-20
Depressive affect								
POMS-D depressive affect	2.47	2.27	0-16	0-12	2.55	2.79	0-16	0-15
DACL-G depressive affect	1.84	2.16	0-16	0-11	2.15	2.75	0-16	0-14
DACL-E depressive affect	1.71	1.97	0-16	0-9	2.21	2.81	0-16	0-14
Dietary restraint								
DRES dietary restraint	10.21	4.25	5-25	5-21	10.73	4.65	5-25	5-25
DIS abstaining from eating	5.30	2.44	3-15	3-14	5.67	2.64	3-15	3-15
TFEQ-R dietary restraint	9.22	4.95	4-28	4-26	10.13	5.73	4-28	4-28
Binge eating								
BULIT-R binge eating	14.82	4.77	9-45	9-32	15.75	5.48	9-45	9-36
EDI-B binge eating	7.45	3.97	4-28	4-24	8.10	4.19	4-28	4-24
EDDS binge eating	13.18	6.64	7-49	7-38	14.61	7.43	7-49	7-45

Note. Means, standard deviations, and ranges are based on 3509 diary responses from 566 study participants; diary responses were aggregated across seven days. For Possible Range, the lowest possible value is on the left side of the dash and the highest possible value is on the right side of the dash; for Actual Range, the lowest observed value is on the left side of the dash and the highest observed value is on the right side of the dash. SOP = self-oriented perfectionism; SPP = socially prescribed perfectionism; global intrapers. discrep. = global intrapersonal discrepancies; appear. intrapers. discrep. = appearance-related intrapersonal discrepancies; global interpers. discrep. = global interpersonal discrepancies; appear. interpers. discrep. = appearance-related interpersonal discrepancies.
*p < .01. **p < .001.

Table C2. Asian Canadians relative to European Canadians.

Manifest variables	Asian Canadians (N = 257)				Euro. Canadians (N = 257)			
	M	*SD*	Possible Range	Actual Range	*M*	*SD*	Possible Range	Actual Range
SOP								
HFMPS-SOP	70.46	13.67	15-105	25-101	74.13	13.10	15-105	40-102
EDI-SOP	11.52	2.81	3-18	5-18	11.93	2.78	3-18	6-18
FMPS personal standards	13.44	2.72	4-20	4-20	14.56	2.62	4-20	5-20
SPP								
HFMPS-SPP	55.38	13.45	15-105	19-92	50.73	12.65	15-105	20-84
EDI-SPP	13.01	2.85	3-18	6-18	12.26	2.77	3-18	3-17
FMPS interpersonal perceptions	10.25	3.45	4-20	4-19	7.94	3.02	4-20	4-17
Neuroticism	26.16	5.73	8-40	10-39	24.54	5.90	8-40	11-39
Intrapersonal discrep.								
MDI global intrapers. discrep.	10.00	2.40	5-20	5-17	8.98	2.32	5-20	5-17
BIQ appear. intrapers. discrep.	20.99	6.46	5-35	5-34	20.42	6.64	5-35	5-35
APS-R global intrapers. discrep.	15.81	4.58	4-28	4-26	13.58	4.51	4-28	4-24
Interpersonal discrep.								
MDI global interpers. discrep.	8.26	2.09	5-20	5-17	7.17	1.90	5-20	5-15
BIQ appear. interpers. discrep.	18.78	5.70	5-35	5-35	17.27	5.88	5-35	5-34
APS-R global interpers. discrep.	12.82	3.96	4-28	4-25	10.47	3.97	4-28	4-23
Intrapersonal esteem								
RSES self-esteem	20.21	3.81	4-28	8-28	21.77	3.93	4-28	10-28
SSES performance self-esteem	12.67	2.58	4-20	4-20	14.28	2.66	4-20	5-20
Interpersonal esteem								
JFFIS social self-esteem	16.93	5.07	4-28	4-28	19.80	4.91	4-28	6-28
SSES social self-esteem	13.74	3.17	4-20	4-20	15.38	3.11	4-20	7-20
Depressive affect								
POMS-D depressive affect	2.69	2.27	0-16	0-14	2.28	2.27	0-16	0-13
DACL-G depressive affect	2.43	2.16	0-16	0-13	1.61	2.09	0-16	0-13
DACL-E depressive affect	2.44	1.97	0-16	0-14	1.58	2.05	0-16	0-13
Dietary restraint								
DRES dietary restraint	10.52	4.25	5-25	5-24	10.70	4.56	5-25	5-25
DIS abstaining from eating	5.65	2.44	3-15	3-15	5.51	2.58	3-15	3-15
TFEQ-R dietary restraint	10.25	4.95	4-28	4-28	9.58	5.38	4-28	4-27
Binge eating								
BULIT-R binge eating	16.20	4.77	9-45	9-36	14.85	5.06	9-45	9-32
EDI-B binge eating	8.18	3.97	4-28	4-24	7.67	4.05	4-28	4-24
EDDS binge eating	15.09	6.64	7-49	7-45	13.35	6.84	7-49	7-38

Note. Means, standard deviations, and ranges are based on 3509 diary responses from 566 study participants; diary responses were aggregated across seven days. For Possible Range, the lowest possible value is on the left side of the dash and the highest possible value is on the right side of the dash; for Actual Range, the lowest observed value is on the left side of the dash and the highest observed value is on the right side of the dash. SOP = self-oriented perfectionism; SPP = socially prescribed perfectionism; global intrapers. discrep. = global intrapersonal discrepancies; appear. intrapers. discrep. = appearance-related intrapersonal discrepancies; global interpers. discrep. = global interpersonal discrepancies; appear. interpers. discrep. = appearance-related interpersonal discrepancies.
*$p < .01$. **$p < .001$.

Table C3. Summary of results comparing U of S students to UBC students.

Statistics employed	Number of comparisons made	Number of significant differences	Magnitudes of significant differences	General conclusion
ANOVA	3	2	Differences were moderate to large in magnitude.	U of S students were significantly higher than students from UBC with respect to time in Canada and BMI.
Bivariate correlations	45	1	To my knowledge, there is no statistic or convention available for estimating the magnitude of a difference between bivariate correlations. Visual inspection suggested that the difference was small in magnitude.	Bivariate correlations generalized across data collection sites (with one exception).
Partial correlations	36	0	N/A	Partial correlations generalized across data collection sites.
Multigroup analysis of the measurement model of the SPP component of the PMOBE	17	2	To my knowledge, there is no statistic or convention available for estimating the magnitude of a difference between factor loadings in a measurement model. Visual inspection suggested that the differences were small in magnitude.	The measurement model for the SPP component of the PMOBE was invariant across data collection sites (with two exceptions).
Multigroup analysis of the fully mediated structural model for the SPP component of the PMOBE	10	0	N/A	The fully mediated structural model for the SPP component of the PMOBE was invariant across data collection sites.
Multilevel moderational analyses with two-way interaction terms involving data collection sites	8 analyses involving 24 two-way interaction terms	0	N/A	Multilevel moderational analyses generalized across data collection sites.
Multilevel moderational analyses with three-way interaction terms involving data collection sites	8 analyses involving 24 two-way interaction terms and 8 three-way interaction terms	0	N/A	Multilevel moderational analyses generalized across data collection sites.
Two-way interaction terms for Path A involving data collection sites	8	0	N/A	Path A generalized across data collection sites.

Note. SPP = socially prescribed perfectionism; N/A = not applicable.

Table C4. Summary of results comparing Asian Canadians to European Canadians.

Statistics employed	Number of comparisons made	Number of significant differences	Magnitudes of significant differences	General conclusion
ANOVA	3	3	Differences were small to large in magnitude.	European Canadians were significantly higher than Asian Canadians with respect to age, time in Canada, and BMI.
Bivariate correlations	45	1	To my knowledge, there is no statistic or convention available for estimating the magnitude of a difference between bivariate correlations. Visual inspection suggested that the difference was small in magnitude.	Bivariate correlations generalized across ethnic groups (with one exception).
Partial correlations	36	1	To my knowledge, there is no statistic or convention available for estimating the magnitude of a difference between partial correlations. Visual inspection suggested that the difference was small in magnitude.	Partial correlations generalized across ethnic groups (with one exception).
Multigroup analysis of the measurement model of the SPP component of the PMOBE	17	3	To my knowledge, there is no statistic or convention available for estimating the magnitude of a difference between factor loadings in a measurement model. Visual inspection suggested that the differences were small in magnitude.	The measurement model for the SPP component of the PMOBE was invariant across ethnic groups (with three exceptions).
Multigroup analysis of the fully mediated structural model for the SPP component of the PMOBE	10	0	N/A	The fully mediated structural model for the SPP component of the PMOBE was invariant across ethnic groups.
Multilevel moderational analyses with two-way interaction terms involving ethnic groups	8 analyses involving 24 two-way interaction terms	0	N/A	Multilevel moderational analyses generalized across ethnic groups.
Multilevel moderational analyses with three-way interaction terms involving ethnic groups	8 analyses involving 24 two-way interaction terms and 8 three-way interaction terms	0	N/A	Multilevel moderational analyses generalized across ethnic groups.
Two-way interaction terms for Path A involving ethnic groups	8	0	N/A	Path A generalized across ethnic groups.

Note. SPP = socially prescribed perfectionism; N/A = not applicable.

APPENDIX D

NORMALITY ASSUMPTIONS, NULL RESULTS,

AND SUPPLEMENTARY ANALYSES

Several additional topics, which were not given sufficient coverage in the main study, are now considered. These topics include normality assumptions as well as null and supplementary findings. A review of assumptions of normality for SEM and for MLM is provided first. Subsequently, null and supplementary results are presented and described.

Assumptions of Normality

The statistics employed in the main study each involve assumptions regarding normality (specific assumptions for each statistical analysis are described in greater detail below). Consistent with recommendations (Cohen, Cohen, West, & Aiken, 2003; Field, 2000; Tabachnick & Fidell, 2001), univariate normality was evaluated by comparing the distribution of each variable to a normal curve and by examining the normal probability plots. Visual inspection of the personality data and the aggregated daily data suggested some deviations from normality for depressive affect, dietary restraint, and binge eating. However, these deviations were all in the same direction (i.e., positively skewed), which may minimize the impact of non-normality on the findings (Tabachnick & Fidell, 2001). Univariate tests of skewness and kurtosis were not employed because, when a large sample is involved (i.e., a sample over 200), these tests are likely to be significant even in the presence of only trivial deviations from normality (Kline, 2005; Tabachnick & Fidell, 2001). Data were also inspected for outliers and no problematic outliers were detected. Thus, the observed non-normality in depressive affect, dietary restraint, and binge eating was not due to outliers (Kline, 2005; Tabachnick & Fidell, 2001). Normality assumptions for each analytic strategy are now reviewed.

Normality in SEM

SEM assumes *multi*variate normality in the data (Byrne, 2001; Kline, 2005). The potential consequences of non-normality in SEM include the chi-square statistic becoming spuriously large and some fit indices (e.g., the comparative fit index) underestimating the fit of the model. The former and the latter may result in Type II errors. Non-normality may also result in the artificial lowering of standard errors, which can result in Type I errors (Byrne, 2001; Enders, 2001).

Although methods to inspect univariate normality are readily available, there are few methods to determine the existence of multivariate normality (Field, 2000). Moreover, the methods currently available to examine multivariate normality (e.g., Mahalanobis distance) have been criticized as unreliable (Tabachnick & Fidell, 2001). As a result, detection of multivariate normality is based primarily on examination of univariate normality (Field, 2000; Kline, 2005).

There are several options available when some degree of non-normality is suspected. One option is to transform the variables so as to achieve univariate normality (Loehlin, 2004; Tabachnick & Fidell, 2001). However, although univariate normality is necessary to achieve multivariate normality, it does not guarantee it (Field, 2000; Kline, 2005). More recent recommendations in the SEM literature suggest the use of bootstrapping as a means of detecting and of minimizing the possible effect of non-normality in structural models (Byrne, 2001; Schumacker & Lomax, 2001).

Bootstrapping is a statistical procedure whereby the original sample is used to generate multiple sub-samples, which are then utilized to estimate parameters (Byrne, 2001; Kline, 2005; Schumacker & Lomax, 2004). The samples generated by this resampling procedure are not subject to the same distributional assumptions (e.g., normality) as the original sample. Because each sample is generated based on sampling with replacement, any of the scores may appear from zero to multiple times in the bootstrapped samples. To be accurate, bootstrapping requires moderate to large sample sizes, such as the one in this study (Byrne, 2001; Kline, 2005).

To examine the impact of possible deviations from multivariate normality on SEM results, the paths of the structural model for the SPP component of the PMOBE were re-examined using bootstrapping procedures. Paths generated utilizing bootstrapping were virtually identical to the results shown in Figure 4 in the main study, suggesting that non-normality has little or no influence on SEM results. For instance, the original results indicated that the

structural path between dietary restraint and binge eating was .34 (see Figure 4 in the main study) and the 90% confidence interval (CI) based on bootstrapping procedures indicated a range of .27 to .41 for this same path. The only 90% CI based on bootstrapping analyses to include zero was the path between depressive affect and binge eating, which was also non-significant in the original results. Overall, bootstrapping estimates were virtually identical to original findings. Bootstrapping estimates are not presented in the main study because such estimates are excessively strict if significant deviations from multivariate normality are not present (Byrne, 2001; Nevitt & Hancock, 2001). In sum, results of bootstrapping procedures suggested that the structural model for the SPP component of the PMOBE was not unduly influenced by possible deviations from normality.

Having shown that SEM results appear robust to possible deviations from normality, the impact of non-normality on MLM findings is now considered.

Normality in MLM

Multilevel modeling assumes that residuals at level 1 and at level 2 are normally distributed (Hox, 2002; Raudenbush & Bryk, 2002). Non-normality may result in biased standard errors, which in turn impacts the accuracy of significance tests (Hox, 2002; Raudenbush & Bryk, 2002). However, the direction and the extent to which non-normality may influence multilevel significance tests is not yet known (Raudenbush & Bryk, 2002).

Identifying non-normality in MLM is more complicated than in regular regression because there are multiple levels of residuals that need to be considered (Hox, 2002; Raudenbush & Bryk, 2002). Raudenbush and Bryk (2002) recommend that residuals at level 1 and at level 2 should be examined separately. Furthermore, these authors assert that *each* level 1 unit should be examined independently. In this study, this would involve examining residuals for each individual's data across seven days. However, Raudenbush and Bryk (2002) note that if the number of units (i.e., sample size at level 2) is large, then pooled residuals should be examined. Given the sample size of this study ($N = 566$), inspection of each level 1 unit is impractical. Moreover, the presence and/or the extent of non-normality would be difficult, if not impossible, to estimate based on visual inspection of 566 individual residual plots. Thus, as suggested by Raudenbush and Bryk (2002), I inspected pooled level 1 and level 2 residuals and found slight departures from normality across moderational and mediational analyses involving depressive affect, dietary restraint, and binge eating.

There are several options to address potential deviations from normality in MLM. The first is to transform the variables to create a more normal error distribution (Hox, 2002; Raudenbush & Bryk, 2002). However, transforming variables may not be practical or advisable in all situations (Hox, 2002; Raudenbush & Bryk, 2002). Transforming hierarchical *daily* data is conceptually distinct from transforming other types of hierarchical data wherein, for example, level 1 consists of individuals (such as students) and level 2 consists of organizations (such as classrooms). That is, although one might expect math scores in a classroom to be normally distributed, one would not necessarily expect normally distributed scores within an individual's reports of binge eating over seven days. Further, in this study transformations aimed at normalizing error distributions would entail transforming each individual's scores over seven days. This is likely to result in a multitude of different transformation schemes in the attempt to normalize each individual's scores. Finally, normalizing individual variables does not guarantee multivariate normality or that other distributional assumptions are met (Field, 2000).

The second option to address potential problems with non-normality in MLM is to use robust standard errors, which are less susceptible to violations of normality (Hox, 2002; Raudenbush & Bryk, 2002; Snijders & Bosker, 1999). Robust standard errors also safeguard against possible violations of other assumptions (e.g., linearity) and may be utilized diagnostically to assess the model (Hox, 2002; Raudenbush & Bryk, 2002). For instance, a large discrepancy between regular standard errors and robust standard errors suggests that the assumption of normality has been violated. A disadvantage of robust standard errors is that they tend to have less power than regular standard errors (Hox, 2002). To be accurate, robust standard errors also require large sample sizes, such as the sample involved in this study (Hox, 2002; Raudenbush & Bryk, 2002).

Given the potential disadvantages of transformation for the interpretability of this study, robust standard errors were utilized to examine the possible effects of any deviations from normality. When MLM analyses were rerun using robust standard errors, the original results (presented in the main study) were virtually unaltered: Specifically, the significance of the original results did not change and visual inspection of the robust and the regular standard errors showed only very minor discrepancies. Although the results based on robust standard errors were highly consistent with the results based on regular standard errors, only regular standard errors are tabled (e.g., see Table 7 in the main study) because robust standard errors may be overly

restrictive (Hox, 2002). In summary, these findings indicate that MLM results were not unduly influenced by any possible violations of non-normality.

Having reviewed assumptions of normality for SEM and for MLM, null and supplementary results are now discussed.

Null and Supplementary Findings

Several sets of supplementary analyses were conducted. These analyses were not included in the main study. Supplementary analyses, along with null findings, are now presented and reviewed.

In Table D1, bivariate correlations between demographic variables are displayed. Several demographic variables were moderately and significantly correlated. Asian ethnicity was negatively, moderately, and significantly correlated with time in Canada and data collection site (UBC = 0 and U of S = 1), indicating that participants who identified their ethnicity as Asian reported they had lived in Canada for a shorter duration and were more likely to be attending UBC, compared to participants of other ethnicities. Individuals who identified their ethnicity as Asian, relative to other ethnic identities, were also significantly younger in age. Participants who self-identified as being of European descent reported living in Canada for a significantly longer duration and were significantly more likely to attend U of S compared to participants who did not identify their ethnicity as European. Furthermore, time in Canada was positively, moderately, and significantly associated with data collection site, suggesting that participants from U of S were more likely to have lived in Canada for a longer duration than participants from UBC. Overall, observed demographics were consistent with previous studies based on samples of university students recruited at U of S (e.g., Morrison & Harriman, 2005; references are contained in Appendix F on p. 199) and at UBC (e.g., Sherry, Hewitt, Flett, & Harvey, 2003).

BMI evidenced weak to moderate associations with other demographic variables. Correlations with BMI indicated that individuals with higher BMI scores were significantly more likely to be older, to have lived in Canada for longer, to be attending U of S, and to identify themselves as European. Asian ethnicity was negatively correlated with BMI, indicating Asian participants had a significantly lower BMI score relative to individuals of other ethnicities. Ethnic differences in BMI observed in this study are consistent with previous research (e.g., Arriaza & Mann, 2001; Gluck & Geliebter, 2002).

Table D2 presents bivariate correlations among daily variables when these variables are not aggregated across days. In other words, bivariate correlations in Table D2 are based on the repeated measurement of the same individuals over time without aggregation. As such, these data violate the assumption of independence and should be interpreted with considerable caution. Correlations in Table D2 approximate correlations among these variables in aggregated form (see Table 3 in the Results section of the main study). However, based on visual inspection of the data, correlations in disaggregated form were generally smaller in magnitude than correlations in aggregated form. Aggregation of data increases reliability, which may in turn increase the magnitude of correlations (Cohen, Cohen, West, & Aiken, 2003; Epstein, 1979).

In Table D3, descriptive statistics (i.e., means, standard deviations, and, coefficients alphas) for neuroticism are displayed. These results closely corresponded with previous studies involving comparable samples (Benet-Martinez & John, 1998). Tables D4 to D9 present descriptive statistics for the manifest variables that constitute the latent constructs involved in the PMOBE. As noted in the main study, means for the HFMPS subscales (Hewitt & Flett, 2004), the EDI-P subscales (Sherry, Hewitt, Besser, McGee, & Flett, 2004), and the FMPS subscales (Sherry, Hall, Hewitt, Flett, & Besser, 2006) fell within one standard deviation of values from past research. Since daily measures were modified (e.g., changing them to suit a 24-hour timeframe), direct comparisons of their means to earlier research were not possible.

Tables D4 to D9 also show the intercorrelations among the manifest variables that make up the latent constructs of SOP and SPP (Table D4), intrapersonal and interpersonal discrepancies (Table D5), intrapersonal and interpersonal esteem (Table D6), depressive affect (Table D7), dietary restraint (Table D8), and binge eating (Table D9). Consonant with recommendations (e.g., Cohen et al., 2003), the intercorrelations among the manifest variables that make up each latent variable were moderate to strong in magnitude. For example, the correlations among the manifest indicators of the latent construct for depressive affect ranged from .91 to .95. In addition, coefficients alphas were adequate for all variables and ranging from .66 to .98 (see Tables D4 to D9). Coefficients alphas for variables measuring binge triggers (i.e., intrapersonal and interpersonal discrepancies, intrapersonal and interpersonal esteem, depressive affect, and dietary restraint) and binge eating were especially high, ranging from .90 to .98.

Multilevel moderation analyses are described in detail in the main study and are considered only briefly here. Specifically, null results of multilevel moderation analyses are

presented in Table D10 for SOP and in Table D11 for SPP. In these analyses, there were no significant interactions between perfectionism dimensions and daily binge triggers in predicting daily binge eating.

Furthermore, Table D12 presents an example of multilevel moderational analyses involving three-way interaction terms, which were utilized to test the generalizability of results across data collection sites (see the Results section of the main study for further discussion). Table D12 displays a typical set of results in which the original findings were largely unaltered by the addition of two- and three-way interaction terms and the interaction terms themselves were nonsignificant. When three-way interaction terms were dropped and only two-way interactions terms were examined (see Table D13 for an example), results also remained consistent with original findings and no significant two-way interaction terms were observed. Parallel analyses were also conducted to examine the generalizability of results across ethnic identities and null findings were again observed. As was discussed in the main study, these results suggested that multilevel moderational analyses generalized across data collection sites and ethnic groups.

Hierarchical multiple regression analyses examining the interaction between perfectionism dimensions and binge triggers (aggregated across seven days) in predicting binge eating (aggregated across seven days) are presented in Table D14 for SOP and in Table D15 for SPP. These results are described in greater detail in Footnote 6 of the main study and are thus discussed only briefly here. Unlike results of multilevel moderational analyses wherein one significant interaction was found (i.e., SOP x dietary restraint; see the Results section of the main study), hierarchical multiple regression analyses did not identify any significant interactions between perfectionism dimensions and binge triggers in predicting binge eating.

Table D16 and Table D17 present an example of moderational analyses testing the generalizability of results across data collection sites and ethnic groups using hierarchical multiple regression. Only a brief synopsis of these results is presented, as they are also described in Footnote 6 of the main study. In keeping with multilevel moderational analyses, no significant two- or three-way interactions were observed providing additional support for the generalizability of findings across data collection sites and ethnic identities.

Null findings for multilevel meditional analyses involving SOP and SPP are shown in Tables D18 and D19, respectively. Multilevel mediational analyses are considered in more detail

in the main study; thus, only a brief description of null results is provided here. With regard to SOP, Path A (i.e., the SOP-intrapersonal esteem relation) was not significant in multilevel meditional analyses involving intrapersonal esteem as the mediator. Similarly, Path B (i.e., the dietary restraint-binge eating link) was not significant when dietary restraint was tested as a mediator. For SPP, the association between dietary restraint and binge eating (i.e., Path B) was not significant. As a significant Path A and B are required to establish mediation (see Baron & Kenny, 1986), these results indicated that (1) intrapersonal esteem and dietary restraint did not mediate the link between SOP and binge eating and (2) dietary restraint was not a significant mediator for the association between SPP and binge eating.

Table D1. Bivariate correlations between demographic variables.

Demographic variables	1	2	3	4	5	6
1. Age	--					
2. Time in Canada	.34**	--				
3. Site	.02	.33**	--			
4. Asian ethnicity	-.14**	-.50**	-.53**	--		
5. European ethnicity	.10	.51**	.58**	-.83**	--	
6. BMI	.23**	.29**	.23**	-.30**	.28**	--

Note. Descriptive statistics and bivariate correlations are based on 566 study participants. Time in Canada = number of years spent living in Canada; Site = data collection site. For data collection site, UBC = 0 and U of S = 1; for Asian ethnicity, Asian = 1 and all other ethnicities = 0; for European ethnicity, European = 1 and all other ethnicities = 0. A correlation in the range of .10 signifies a small effect size; a correlation in the range of .30 signifies a medium effect size; a correlation in the range of.50 signifies a large effect size (Cohen, 1992).
*$p < .01$. **$p < .001$.

Table D2. Bivariate correlations involving daily variables in disaggregated form.

Manifest variables	1	2	3	4	5	6	7
1. Intrapersonal discrep.	--						
2. Interpersonal discrep.	.77**	--					
3. Intrapersonal esteem	-.67**	-.65**	--				
4. Interpersonal esteem	-.50**	-.51**	.53**	--			
5. Depressive affect	.51**	.51**	-.59**	-.42**	--		
6. Dietary restraint	.38**	.32**	-.21**	-.33**	.20**	--	
7. Binge eating	.40**	.36**	-.29**	-.29**	.29**	.31**	--

Note. Bivariate correlations involving daily variables in disaggregated form are based on 3509 diary responses from 566 study participants. In Table D2, diary responses were not aggregated across days. In other words, bivariate correlations in Table D2 are based on the repeated assessment of the same individuals over time, thereby violating the assumption of independence. Thus, data in Table D2 should be viewed with caution. Intrapersonal discrep. = intrapersonal discrepancies; Interpersonal discrep. = interpersonal discrepancies.
*$p < .01$. **$p < .001$.

Table D3. Descriptive statistics for the indicator of Neuroticism.

	M	*SD*	*α*
NEU: BFI	25.38	5.98	.79

Note. NEU: BFI = neuroticism subscale of the Big Five Inventory. *M* = means; *SD* = standard deviations; α = coefficients alpha.

Table D4. Descriptive statistics for and bivariate correlations between indicators of self-oriented perfectionism and socially prescribed perfectionism.

	SOP: HFM	SOP: FMP	SOP: EDI	SOP	SPP: HFM	SPP: FMP	SPP: EDI	SPP	*M*	*SD*	α
SOP: HFM	--								72.66	13.81	.89
SOP: FMP	.65**	--							14.12	2.84	.76
SOP: EDI	.74**	.64**	--						11.80	2.88	.66
SOP	.90**	.86**	.90**	--					--	--	.92
SPP: HFM	.44**	.27**	.48**	.45**	--				52.94	12.78	.85
SPP: FMP	.06	.00	.18**	.09	.62**	--			9.05	3.44	.75
SPP: EDI	.37**	.32**	.44**	.43**	.55**	.47**	--		12.66	2.79	.67
SPP	.35**	.24**	.44**	.38**	.87**	.83**	.80**	--	--	--	.89

Note. SOP: HFM = self-oriented perfectionism subscale of Hewitt and Flett's Multidimensional Perfectionism Scale; SOP: FMP = self-oriented perfectionism subscale of Frost's Multidimensional Perfectionism Scale; SOP: EDI = self-oriented perfectionism subscale of the Eating Disorders Inventory; SOP = self-oriented perfectionism measured as an aggregation of SOP: HFM, SOP: FMP, and SOP: EDI; SPP: HFM = socially prescribed perfectionism subscale of Hewitt and Flett's Multidimensional Perfectionism Scale; SPP: FMP = socially prescribed perfectionism subscale of Frost et al.'s Multidimensional Perfectionism Scale; SPP: EDI = socially prescribed perfectionism subscale of the Eating Disorders Inventory; SPP = socially prescribed perfectionism measured as an aggregation of SPP: HFM, SPP: FMP, and SPP: EDI. *M* = means; *SD* = standard deviations; α = coefficients alpha. A correlation in the range of .10 signifies a small effect size; a correlation in the range of .30 signifies a medium effect size; a correlation in the range of.50 signifies a large effect size (Cohen, 1992).
*$p < .01$. **$p < .001$.

Table D5. Descriptive statistics for and bivariate correlations between indicators of intrapersonal discrepancies and interpersonal discrepancies.

	RA: MDI	RA: BIQ	RA: APS	RA: DIS	ER: MDI	ER: BIQ	ER: APS	ER: DIS	*M*	*SD*	*α*
RA: MDI	--								9.53	2.66	.94
RA: BIQ	.38**	--							20.78	6.54	.92
RA: APS	.81**	.44**	--						14.71	4.70	.96
RA: DIS	.87**	.73**	.90**	--					--	--	.94
ER: MDI	.80**	.30**	.60**	.68**	--				7.75	2.36	.95
ER: BIQ	.36**	.80**	.41**	.63**	.35**	--			18.07	5.74	.94
ER: APS	.70**	.40**	.80**	.76**	.76**	.45**	--		11.64	4.25	.98
ER: DIS	.75**	.60**	.73**	.83**	.85**	.73**	.89**	--	--	--	.94

Note. RA = intrapersonal; ER = interpersonal; RA: MDI = intrapersonal discrepancy subscale of the Multidimensional Discrepancy Inventory; RA: BIQ = intrapersonal discrepancy subscale of the Body-Image Ideals Questionnaire; RA: APS = intrapersonal discrepancy subscale of the Almost Perfect Scale-Revised; RA: DIS = intrapersonal discrepancy measured as an aggregation of RA: MDI, RA: BIQ, and RA: APS; ER: MDI = interpersonal discrepancy subscale of the Multidimensional Discrepancy Inventory; ER: BIQ = interpersonal discrepancy subscale of the Body-Image Ideals Questionnaire; ER: APS = interpersonal discrepancy subscale of the Almost Perfect Scale-Revised; ER: DIS = interpersonal discrepancy measured as an aggregation of ER: MDI, ER: BIQ, and ER: APS. *M* = means; *SD* = standard deviations; α = coefficients alpha. A correlation in the range of .10 signifies a small effect size; a correlation in the range of .30 signifies a medium effect size; a correlation in the range of.50 signifies a large effect size (Cohen, 1992).
*$p < .01$. **$p < .001$.

Table D6. Descriptive statistics for and bivariate correlations between indicators of intrapersonal esteem and interpersonal esteem.

	RA: RSE	RA: SSP	RA: EST	ER: JFF	ER: SSS	ER: EST	*M*	*SD*	*α*
RA: RSE	--						20.98	4.25	.92
RA: SSP	.78**	--					13.49	2.91	.90
RA: EST	.94**	.94**	--				--	--	.94
ER: JFF	.55**	.51**	.55**	--			18.46	5.27	.92
ER: SSS	.60**	.52**	.61**	.75**	--		14.61	3.47	.94
ER: EST	.61**	.55**	.62**	.94**	.94**	--	--	--	.95

Note. RA = intrapersonal; ER = interpersonal; RA: RSE = Rosenberg Self-Esteem Scale (intrapersonal esteem); RA: SSP = performance subscale of the State Self-Esteem Scale (intrapersonal esteem); RA: EST = intrapersonal esteem measured as an aggregation of RA: RSE and RA: SSP; ER: JFF = interpersonal esteem subscale of the Janis-Field Feelings of Inadequacy Scale; ER: SSS = social subscale of the State Self-Esteem Scale (interpersonal esteem); ER: EST = interpersonal esteem measured as an aggregation of ER: JFF and ER: SSS. *M* = means; *SD* = standard deviations; α = coefficients alpha. A correlation in the range of .10 signifies a small effect size; a correlation in the range of .30 signifies a medium effect size; a correlation in the range of.50 signifies a large effect size (Cohen, 1992).
*$p < .01$. **$p < .001$.

Table D7. Descriptive statistics for and bivariate correlations between indicators of depressive affect.

	DA: POM	DA: DAG	DA: DAE	*M*	*SD*	*α*
DA: POM	--			2.53	2.63	.93
DA: DAG	.94**	--		2.05	2.58	.92
DA: DAE	.91**	.95**	--	2.05	2.59	.95
DEP	.97**	.99**	.98**	--	--	.98

Note. DA: POM = depressive affect subscale of the Profile of Mood States; DA: DAG = depressive affect subscale of Form G of the Depression Adjective Checklist; DA: DAE = depressive affect subscale of Form E of the Depression Adjective Checklist; DEP = depressive affect measured as an aggregation of DA: POM, DA: DAG, and DA: DAE. *M* = means; *SD* = standard deviations; α = coefficients alpha. A correlation in the range of .10 signifies a small effect size; a correlation in the range of .30 signifies a medium effect size; a correlation in the range of.50 signifies a large effect size (Cohen, 1992).
*$p < .01$. **$p < .001$.

Table D8. Descriptive statistics for and bivariate correlations between indicators of dietary restraint.

	RES: DRE	RES: DIS	RES: TFE	*M*	*SD*	*α*
RES: DRE	--			10.57	4.53	.94
RES: DIS	.86**	--		5.55	2.58	.94
RES: TFE	.90**	.84**	--	9.84	5.51	.97
RES	.96**	.94**	.96**	--	--	.98

Note. RES: DRE = Dutch Restrained Eating Scale (dietary restraint); RES: DIS = Dietary Intent Scale (dietary restraint); RES: TFE = dietary restraint subscale of the Three-Factor Eating Questionnaire; RES = dietary restraint measured as an aggregation of RES: DRE, RES: DIS, and RES: TFE. *M* = means; *SD* = standard deviations; α = coefficients alpha. A correlation in the range of .10 signifies a small effect size; a correlation in the range of .30 signifies a medium effect size; a correlation in the range of.50 signifies a large effect size (Cohen, 1992).
*$p < .01$. **$p < .001$.

Table D9. Descriptive statistics for and bivariate correlations between indicators of binge eating.

	BE: BUL	BE: EDI	BE: EDD	*M*	*SD*	*α*
BE: BUL	--			15.46	5.28	.92
BE: EDI	.86**	--		7.90	4.13	.90
BE: EDD	.89**	.92**	--	14.16	7.22	.95
BE	.95**	.96**	.97**	--	--	.97

Note. BE: BUL = binge eating subscale of the Bulimia Test-Revised; BE: EDI = binge eating subscale of the Eating Disorder Inventory; BE: EDD = binge eating subscale of the Eating Disorder Diagnostic Scale; BE = binge eating measured as an aggregation of BE: BUL, BE: EDI, and BE: EDD. *M* = means; *SD* = standard deviations; α = coefficients alpha. A correlation in the range of .10 signifies a small effect size; a correlation in the range of .30 signifies a medium effect size; a correlation in the range of.50 signifies a large effect size (Cohen, 1992).
*$p < .01$. **$p < .001$.

Table D10. Multilevel moderational analyses involving self-oriented perfectionism and showing nonsignificant interactions.

Variable	R^2	χ^2 (df)	*B*	*SE*
Intrapersonal discrep. as a moderator				
Intercept	.06	326.54** (11)	38.87**	5.33
Demographics				
Time in Canada			-0.48**	0.11
BMI			0.51	0.26
Prior-day binge eating			0.01	0.03
Intrapersonal discrep.			0.28**	0.04
SOP			3.45**	0.77
Intrapersonal discrep. x SOP			0.03	0.03
Intrapersonal esteem as a moderator				
Intercept	.05	208.90** (11)	39.95**	5.44
Demographics				
Time in Canada			-0.50**	0.11
BMI			0.47	0.27
Prior-day binge eating			0.02	0.03
Intrapersonal esteem			-0.30**	0.06
SOP			3.48**	0.77
Intrapersonal esteem x SOP			-0.08	0.06
Depressive affect as a moderator				
Intercept	.05	221.80** (11)	38.87**	5.49
Demographics				
Time in Canada			-0.51**	0.11
BMI			0.53	0.27
Prior-day binge eating			0.01	0.03
Depressive affect			0.27**	0.06
SOP			3.48**	0.77
Depressive affect x SOP			0.11	0.06
Interpersonal discrep. as a moderator				
Intercept	.05	228.14** (11)	39.18**	5.41
Demographics				
Time in Canada			-0.49**	0.11
BMI			0.50	0.27
Prior-day binge eating			0.02	0.03
Interpersonal discrep.			0.25**	0.04
SOP			3.47**	0.77
Interpersonal discrep. x SOP			0.03	0.04

Continued on next page

Table D10. continued

Variable	R^2	χ^2 (df)	*B*	*SE*
Interpersonal esteem as a moderator				
Intercept	.05	157.57** (11)	39.92**	5.51
Demographics				
Time in Canada			-0.53**	0.11
BMI			0.49	0.27
Prior-day binge eating			0.02	0.03
Interpersonal esteem			-0.19**	0.05
SOP			3.50**	0.77
Interpersonal esteem x SOP			-0.10	0.06

Note. Multilevel moderational analyses are based on 2974 diary responses from 566 study participants. R^2 = the percentage of daily binge eating variance explained by the predictor block; χ^2 = a test to determine whether the percentage of daily binge eating variance explained by the predictor block is significantly different from the null model; *B* = an unstandardized coefficient. The intercept is used to indicate whether the average level of binge eating is significantly different from zero (after controlling for the other variables in the predictor block). Time in Canada = number of years spent living in Canada; SOP = self-oriented perfectionism; Intrapersonal discrep. = intrapersonal discrepancies; Interpersonal discrep. = interpersonal discrepancies.
*$p < .01$. **$p < .001$.

Table D11. Multilevel moderational analyses involving socially prescribed perfectionism and showing nonsignificant interactions.

Variable	R^2	χ^2 (df)	*B*	*SE*
Interpersonal discrep. as a moderator				
Intercept	.07	240.58** (11)	39.61**	5.36
Demographics				
Time in Canada			-0.39**	0.11
BMI			0.41	0.26
Prior-day binge eating			0.03	0.03
Interpersonal discrep.			0.25**	0.04
SPP			4.36**	0.76
Interpersonal discrep. x SPP			0.04	0.04
Interpersonal esteem as a moderator				
Intercept	.06	168.09** (11)	40.38**	5.45
Demographics				
Time in Canada			-0.42**	0.11
BMI			0.39	0.27
Prior-day binge eating			0.02	0.03
Interpersonal esteem			-0.19**	0.05
SPP			4.34**	0.76
Interpersonal esteem x SPP			-0.06	0.05
Depressive affect as a moderator				
Intercept	.07	232.20** (11)	39.26**	5.43
Demographics				
Time in Canada			-0.40**	0.11
BMI			0.43	0.27
Prior-day binge eating			0.01	0.03
Depressive affect			0.28**	0.06
SPP			4.34**	0.76
Depressive affect x SPP			0.02	0.06
Dietary restraint as a moderator				
Intercept	.07	391.10** (11)	41.52**	5.40
Demographics				
Time in Canada			-0.42**	0.11
BMI			0.34	0.26
Prior-day binge eating			0.04	0.03
Dietary restraint			-0.13	0.05
SPP			4.33**	0.76
Dietary restraint x SPP			-0.02	0.06
Intrapersonal discrep. as a moderator				
Intercept	.07	341.33** (11)	39.28**	5.26
Demographics				
Time in Canada			-0.37**	0.11
BMI			0.41	0.26
Prior-day binge eating			0.01	0.03
Intrapersonal discrep.			0.28**	0.04
SPP			4.37**	0.76
Intrapersonal discrep. x SPP			0.01	0.04

Continued on next page

Table D11. continued

Variable	R^2	χ^2 (df)	*B*	*SE*
Intrapersonal esteem as a moderator				
Intercept	.07	221.80** (11)	40.45**	5.37
Demographics				
Time in Canada			-0.39**	0.11
BMI			0.37	0.26
Prior-day binge eating			0.02	0.03
Intrapersonal esteem			-0.31**	0.06
SPP			4.37**	0.76
Intrapersonal esteem x SPP			-0.02	0.06

Note. Multilevel moderational analyses are based on 2974 diary responses from 566 study participants. R^2 = the percentage of daily binge eating variance explained by the predictor block; χ^2 = a test to determine whether the percentage of daily binge eating variance explained by the predictor block is significantly different from the null model; *B* = an unstandardized coefficient. The intercept is used to indicate whether the average level of binge eating is significantly different from zero (after controlling for the other variables in the predictor block). Time in Canada = number of years spent living in Canada; SPP = socially prescribed perfectionism; Interpersonal discrep. = interpersonal discrepancies; Intrapersonal discrep. = intrapersonal discrepancies.
*$p < .01$. **$p < .001$.

Table D12. An example of multilevel moderational analyses showing nonsignificant three-way interactions: Assessing the generalizability of results across data collection sites.

Variable	R^2	χ^2 (df)	*B*	*SE*
Intrapersonal discrep. as a moderator				
Intercept	.06	329.35** (15)	38.15**	5.41
Demographics				
Time in Canada			-0.45**	0.11
BMI			0.55	0.26
Site			-1.67	1.75
Prior-day binge eating			0.01	0.03
Intrapersonal discrep.			0.31**	0.04
SOP			2.97*	0.92
Intrapersonal discrep. x site			-0.09	0.08
SOP x site			1.58	1.69
Intrapersonal discrep. x SOP			0.02	0.04
Intrapersonal discrep. x SOP x site			0.05	0.08

Note. Multilevel moderational analyses are based on 2974 diary responses from 566 study participants. R^2 = the percentage of daily binge eating variance explained by the predictor block; χ^2 = a test to determine whether the percentage of daily binge eating variance explained by the predictor block is significantly different from the null model; *B* = an unstandardized coefficient. The intercept is used to indicate whether the average level of binge eating is significantly different from zero (after controlling for the other variables in the predictor block). Time in Canada = number of years spent living in Canada; Site = data collection site; SOP = self-oriented perfectionism; Intrapersonal discrep. = intrapersonal discrepancies. For data collection site, UBC = 0 and U of S = 1.
*p < .01. **p < .001.

Table D13. An example of multilevel moderational analyses showing nonsignificant two-way interactions: Assessing the generalizability of results across data collection sites.

Variable	R^2	χ^2 (df)	*B*	*SE*
Intrapersonal discrep. as a moderator				
Intercept	.06	328.96** (14)	38.13**	5.41
Demographics				
Time in Canada			-0.45**	0.11
BMI			0.55	0.26
Site			-1.67	1.75
Prior-day binge eating			0.01	0.03
Intrapersonal discrep.			0.31**	0.04
SOP			3.06**	0.91
Intrapersonal discrep. x site			-0.09	0.08
SOP x site			1.30	1.62
Intrapersonal discrep. x SOP			0.03	0.03

Note. Multilevel moderational analyses are based on 2974 diary responses from 566 study participants. R^2 = the percentage of daily binge eating variance explained by the predictor block; χ^2 = a test to determine whether the percentage of daily binge eating variance explained by the predictor block is significantly different from the null model; *B* = an unstandardized coefficient. The intercept is used to indicate whether the average level of binge eating is significantly different from zero (after controlling for the other variables in the predictor block). Time in Canada = number of years spent living in Canada; Site = data collection site; SOP = self-oriented perfectionism; Intrapersonal discrep. = intrapersonal discrepancies. For data collection site, UBC = 0 and U of S = 1.
*$p < .01$. **$p < .001$.

Table D14. Self-oriented perfectionism and hierarchical multiple regression analyses with two-way interaction terms.

Variable	R^2	β	ΔR^2	ΔF
Intrapersonal discrep. as a moderator				
Step 1	.04		.04	10.72**
Time in Canada		-.19**		
BMI		.10		
Step 2	.08		.04	24.57**
SOP		.20**		
Step 3	.26		.18	135.03**
Intrapersonal discrep.		.45**		
Step 4	.26		.00	0.21
SOP x intrapersonal discrep.		.02		
Intrapersonal esteem as a moderator				
Step 1	.04		.04	10.72**
Time in Canada		-.19**		
BMI		.10		
Step 2	.08		.04	24.57**
SOP		.20**		
Step 3	.17		.10	65.11**
Intrapersonal esteem		-.31**		
Step 4	.17		.00	0.06
SOP x intrapersonal esteem		.01		
Depressive affect as a moderator				
Step 1	.04		.04	10.72**
Time in Canada		-.19**		
BMI		.10		
Step 2	.08		.04	24.57**
SOP		.20**		
Step 3	.17		.09	58.78**
Depressive affect		.30**		
Step 4	.17		.00	0.46
SOP x depressive affect		-.03		
Dietary restraint as a moderator				
Step 1	.04		.04	10.72**
Time in Canada		-.19**		
BMI		.10		
Step 2	.08		.04	24.57**
SOP		.20**		
Step 3	.23		.16	114.54**
Dietary restraint		.41**		
Step 4	.23		.00	0.00
SOP x dietary restraint		.00		
Interpersonal discrep. as a moderator				
Step 1	.04		.04	10.72**
Time in Canada		-.19**		
BMI		.10		
Step 2	.08		.04	24.57**
SOP		.20**		
Step 3	.23		.15	107.24**
Interpersonal discrep.		.40**		
Step 4	.23		.00	0.58
SOP x interpersonal discrep.		-.03		

Continued on next page

Table D14. continued

Variable	R^2	β	ΔR^2	ΔF
Interpersonal esteem as a moderator				
Step 1	.04		.04	10.72**
Time in Canada		-.19**		
BMI		.10		
Step 2	.08		.04	24.57**
SOP		.20**		
Step 3	.17		.09	63.45**
Interpersonal esteem		-.32**		
Step 4	.17		.00	1.40
SOP x interpersonal esteem		-.05		

Note. Hierarchical multiple regression analyses with two-way interaction terms are based on 3509 diary responses from 566 study participants; diary responses were aggregated across seven days. Time in Canada = number of years spent living in Canada; SOP = self-oriented perfectionism; Intrapersonal discrep. = intrapersonal discrepancies; Interpersonal discrep. = interpersonal discrepancies. For Step 1, $df = 2, 563$. For Step 2, $df = 1, 562$. For Step 3, $df = 1, 561$. For Step 4, $df = 1, 560$.
*$p < .01$. **$p < .001$.

Table D15. Socially prescribed perfectionism and hierarchical multiple regression analyses with two-way interaction terms.

Variable	R^2	β	ΔR^2	ΔF
Interpersonal discrep. as a moderator				
Step 1	.04		.04	10.72**
Time in Canada		-.19**		
BMI		.10		
Step 2	.10		.06	36.30**
SPP		.24**		
Step 3	.21		.12	81.46**
Interpersonal discrep.		.39**		
Step 4	.21		.00	0.21**
SPP x interpersonal discrep.		-.02		
Interpersonal esteem as a moderator				
Step 1	.04		.04	10.72**
Time in Canada		-.10**		
BMI		.10		
Step 2	.10		.06	36.30**
SPP		.24**		
Step 3	.17		.07	46.95**
Interpersonal esteem		-.30**		
Step 4	.17		.00	0.00
SPP x interpersonal esteem		.00		
Depressive affect as a moderator				
Step 1	.04		.04	10.72**
Time in Canada		-.19**		
BMI		.10		
Step 2	.10		.06	36.30**
SPP		.24**		
Step 3	.16		.07	43.95**
Depressive affect		.28**		
Step 4	.17		.01	3.99
SPP x depressive affect		-.09		
Dietary restraint as a moderator				
Step 1	.04		.04	10.72**
Time in Canada		-.19**		
BMI		.10		
Step 2	.10		.06	36.30**
SPP		.24**		
Step 3	.25		.15	112.67**
Dietary restraint		.40**		
Step 4	.25		.00	0.13
SPP x dietary restraint		-.01		
Intrapersonal discrep. as a moderator				
Step 1	.04		.04	10.72**
Time in Canada		-.19**		
BMI		.10		
Step 2	.10		.06	36.30**
SPP		.24**		
Step 3	.25		.15	114.11**
Intrapersonal discrep.		.44**		
Step 4	.25		.00	0.42
SPP x intrapersonal discrep.		.02		

Continued on next page

Table D15. continued

Variable	R^2	β	ΔR^2	ΔF
Intrapersonal esteem as a moderator				
Step 1	.04		.04	10.72**
Time in Canada		-.19**		
BMI		.10		
Step 2	.10		.06	36.30**
SPP		.24**		
Step 3	.15		.06	38.37**
Intrapersonal esteem		-.27**		
Step 4	.16		.00	1.28**
SPP x intrapersonal esteem		.04		

Note. Hierarchical multiple regression analyses with two-way interaction terms are based on 3509 diary responses from 566 study participants; diary responses were aggregated across seven days. Time in Canada = number of years spent living in Canada; SPP = socially prescribed perfectionism; Interpersonal discrep. = interpersonal discrepancies; Intrapersonal discrep. = intrapersonal discrepancies. For Step 1, $df = 2, 563$. For Step 2, $df = 1, 562$. For Step 3, $df = 1, 561$. For Step 4, $df = 1, 560$.
*$p < .01$. **$p < .001$.

Table D16. An example of hierarchical multiple regression analyses with three-way interaction terms: Assessing the generalizability of results across data collection sites.

Variable	R^2	β	ΔR^2	ΔF
Intrapersonal discrep. as a moderator				
Step 1	.04		.04	7.56**
Time in Canada		-.18**		
BMI		.11		
Site		-.05		
Step 2	.08		.04	24.30**
SOP		.20**		
Step 3	.26		.18	133.53**
Intrapersonal discrep.		.45**		
Step 4	.26		.00	1.01
SOP x site		.04		
Step 5	.26		.00	0.40
Intrapersonal discrep. x site		.03		
Step 6	.26		.00	0.35
SOP x intrapersonal discrep.		.02		
Step 7	.27		.01	6.68
SOP x intrapersonal discrep. x site		.11		

Note. Hierarchical multiple regression analyses with three-way interaction terms are based on 3509 diary responses from 566 study participants; diary responses were aggregated across seven days. Time in Canada = number of years spent living in Canada; Site = data collection site; SOP = self-oriented perfectionism; Intrapersonal discrep. = intrapersonal discrepancies. For data collection site, UBC = 0 and U of S = 1. For Step 1, $df = 3, 562$. For Step 2, $df = 1, 561$. For Step 3, $df = 1, 560$. For Step 4, $df = 1, 559$. For Step 5, $df = 1, 558$. For Step 6, $df = 1, 557$. For Step 7, $df = 1, 556$.
*$p < .01$. **$p < .001$.

Table D17. An example of hierarchical multiple regression analyses with two-way interaction terms: Assessing the generalizability of results across data collection sites.

Variable	R^2	β	ΔR^2	ΔF
Intrapersonal discrep. as a moderator				
Step 1	.04		.04	7.56**
Time in Canada		-.18**		
BMI		.11		
Site		-.05		
Step 2	.08		.04	24.30**
SOP		.20**		
Step 3	.26		.18	133.53**
Intrapersonal discrep.		.45**		
Step 4	.26		.00	1.01
SOP x site		.04		
Step 5	.26		.00	0.40
Intrapersonal discrep. x site		.03		
Step 6	.26		.00	0.35
SOP x intrapersonal discrep.		.02		

Note. Hierarchical multiple regression analyses with two-way interaction terms are based on 3509 diary responses from 566 study participants; diary responses were aggregated across seven days. Time in Canada = number of years spent living in Canada; Site = data collection site; SOP = self-oriented perfectionism; Intrapersonal discrep. = intrapersonal discrepancies. For data collection site, UBC = 0 and U of S = 1. For Step 1, $df = 3, 562$. For Step 2, $df = 1, 561$. For Step 3, $df = 1, 560$. For Step 4, $df = 1, 559$. For Step 5, $df = 1, 558$. For Step 6, $df = 1, 557$.
*$p < .01$. **$p < .001$.

Table D18. Multilevel mediational analyses involving self-oriented perfectionism.

Path	Description of Path	R^2	*B*	*SE*	Sobel (z)	Strength (%)
	Intrapersonal esteem as a mediator					
Path C	SOP to binge eating	.05	3.51**	0.77	--	--
Path A	SOP to intrapersonal esteem	.02	-0.39	0.34	--	--
Path B	Intrapersonal esteem to binge eating	.02	-0.30**	0.06	--	--
Path B'	Intrapersonal esteem to binge eating controlling for SOP	--	-0.30**	0.06	--	--
Path C'	SOP to binge eating controlling for intrapersonal esteem	.05	3.30**	0.76	1.11	3.3
	Dietary restraint as a mediator					
Path C	SOP to binge eating	.05	3.51**	0.77	--	--
Path A	SOP to dietary restraint	.06	3.04**	0.62	--	--
Path B	Dietary restraint to binge eating	.02	-0.13	0.05	--	--
Path B'	Dietary restraint to binge eating controlling for SOP	--	-0.14	0.05	--	--
Path C'	SOP to binge eating controlling for dietary restraint	.05	3.18**	0.76	2.28	N/A

Note. Multilevel mediational analyses are based on 2974 diary responses from 566 study participants. R^2 = the percentage of level 1 variance explained by the predictor block*; B* = an unstandardized coefficient; Sobel (z) = a test to determine whether the indirect effect of the predictor (e.g., SOP) on the criterion (e.g., binge eating) via the mediator (e.g., intrapersonal esteem) is significantly different from zero; Strength (%) = the strength of the mediated effect (e.g., intrapersonal esteem mediated 3.3% of the total effect of SOP on binge eating; see Shrout & Bolger, 2002, p. 434); Strength (%) = the strength of the mediated effect; N/A = The interpretation of the strength of the mediated effect is clear only when Path A and Path B are the same sign (Shrout & Bolger, 2002). *$p < .01$. **$p < .001$.

Table D19. Multilevel mediational analyses involving socially prescribed perfectionism.

Path	Description of Path	R^2	*B*	*SE*	Sobel (z)	Strength (%)
	Dietary restraint as a mediator					
Path C	SPP to binge eating	.06	4.34**	0.75	--	--
Path A	SPP to dietary restraint	.06	2.79**	0.61	--	--
Path B	Dietary restraint to binge eating	.02	-0.13	0.05	--	--
Path B'	Dietary restraint to binge eating controlling for SPP	--	-0.13	0.05	--	--
Path C'	SPP to binge eating controlling for dietary restraint	.07	4.27**	0.75	2.17	N/A

Note. Multilevel mediational analyses are based on 2974 diary responses from 566 study participants. R^2 = the percentage of level 1 variance explained by the predictor block; *B* = an unstandardized coefficient; Sobel (z) = a test to determine whether the indirect effect of the predictor (e.g., SPP) on the criterion (e.g., binge eating) via the mediator (e.g., dietary restraint) is significantly different from zero; Strength (%) = the strength of the mediated effect; N/A = The interpretation of the strength of the mediated effect is clear only when Path A and Path B are the same sign (Shrout & Bolger, 2002).
*$p < .01$. **$p < .001$.

APPENDIX E

PSYCHOMETRIC STUDY

A cross-sectional, psychometric study was conducted to examine the correspondence between the original measures (e.g., the Multidimensional Discrepancy Inventory) and the revised daily measures (e.g., the Multidimensional Discrepancy Inventory revised to suit a 24-hour timeframe) utilized in Phase 2 of this investigation. Parts of this psychometric study were incorporated into the main study (e.g., see Footnote 2 and the Method section). Throughout the main study, this psychometric study is referenced as Sherry and Hall (2006; Appendix E on p. 190). In what follows, this psychometric study is elaborated upon.

In this psychometric study, the original and the revised measures were compared. Original measures were revised by reducing the number of items. Congruent with previous diary studies, measures were shortened when the original scale was too long to incorporate into a daily process study (e.g., Bolger & Zuckerman, 1995; references are contained in Appendix F on p. 199). In general, the highest loading items, based on previous factor analyses, were selected. Details on items selected for each specific scale are described in the Method section of the main study. When necessary, original measures were also slightly modified so as to agree with the 24-hour timeframe adopted in this study, as is commonly done in diary research (e.g., Crocker, Karpinski, Quinn, & Chase, 2003; Fortenberry et al., 2005). For instance, the Rosenberg Self-Esteem Scale (Rosenberg, 1965) item "I feel I do not have much to be proud of" was changed to "During the past 24 hours, I felt I did not have much to be proud of." Revised measures are presented in Appendix G on p. 215.

A brief summary of the participants, measures, procedure, and results of this psychometric study is now provided.

Participants

As noted in Footnote 2 in the main study, this psychometric study involved 112 university students (37 men; 75 women) from the University of Saskatchewan (U of S; Saskatoon, Canada). Participants averaged 22.38 years of age (*SD* = 6.65) and 1.60 years of university education (*SD* = 1.04); 67.9% of students were in their first year of university, 15.2% were in their second year, 11.6% were in their third year, and 5.3% were in their fourth year or higher. No other demographic information was collected.

Measures

The measures utilized in this psychometric study are discussed below. The psychometric properties of these measures are considered in detail in the Method section of the main study. Thus, only a brief synopsis is provided here. There is extensive research supporting the reliability and the validity of all original measures used in this study. For all measures, higher scores signify higher levels of a given construct. Each construct (e.g., dietary restraint) was assessed utilizing multiple measures.

Intrapersonal and interpersonal discrepancies. (1) The original and the revised Multidimensional Discrepancy Inventory (MDI; Flett & Hewitt, 2006) were used to assess discrepancies. The MDI assesses global intrapersonal and interpersonal discrepancies. (2) The original and the revised Body-Image Ideals Questionnaire (BIQ; Cash & Szymanski, 1995; Szymanski & Cash, 1995) were utilized to measure appearance-related intrapersonal discrepancies and appearance-related interpersonal discrepancies. (3) The original Almost Perfect Scale-Revised (APS-R; Slaney, Rice, Mobley, Trippi, & Ashby, 2001) was used to assess

global intrapersonal discrepancies, whereas the revised APS-R was utilized to assess global intrapersonal and interpersonal discrepancies.

Intrapersonal and interpersonal esteem. (1) The original and the revised State Self-Esteem Scale (SSES; Heatherton & Polivy, 1991) were used to measure self-esteem. The performance self-esteem subscale of the SSES assessed intrapersonal esteem and the social self-esteem subscale of the SSES measured interpersonal esteem. (2) The original and the revised Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) were utilized to measure intrapersonal esteem. (3) The original and the revised Janis-Field Feelings of Inadequacy Scale (JFFIS; Janis & Field, 1959*)* were used to measure interpersonal esteem. Specifically, the social self-esteem subscale of the JFFIS was utilized.

Dietary restraint. (1) The original and the revised Dutch Restrained Eating Scale (DRES; van Strien, Frijters, Bergers, & Defares, 1986) were used to measure dietary restraint. (2) The original and the revised Dietary Intent Scale (DIS; Stice, 1998b) measured dietary restraint. Specifically, the 3-item abstaining from eating subscale of the DIS was utilized. (3) The original and the revised Three-Factor Eating Questionnaire (TFEQ-R; Stunkard & Messick; 1985*)* measured dietary restraint. The restraint subscale of the TFEQ-R was used.

Binge eating. (1) The original and the revised binge eating subscale of the Bulimia Test-Revised (BULIT-R; Thelen, Farmer, Wonderlich, & Smith, 1991) were utilized to measure binge eating. (2) The original and the revised binge eating subscale of the Eating Disorder Inventory (EDI-B; Garner, Olmstead, & Polivy, 1983) assessed binge eating. (3) The original and the revised binge eating subscale of the Eating Disorder Diagnostic Scale (EDDS; Stice, Telch, & Rizvi, 2000) were used to measure binge eating.

Procedure

Participants were recruited from an introductory psychology course at U of S. In exchange for their participation, U of S students received a 2.0% bonus added to their course grade. This study was reviewed by and approved by the U of S Behavioral Research Ethics Board. Participation in this investigation was anonymous and voluntary and each participant gave informed consent. Following their involvement in this study, all participants were debriefed (see Appendix H on p. 236).

Results

Descriptive statistics. Descriptive statistics are presented in Table E1 to E4. These results were considered relative to previously reported values from comparable populations. Means and standards deviations for the original MDI (Flett & Hewitt, 2006), BIQ (McGee, Hewitt, Sherry, Parkin, & Flett, 2005; Szymanski & Cash, 1995), APS-R (Gilman, Ashby, Sverko, Florell, & Varjas, 2005; Grzegorek, Slaney, Franze, & Rice, 2004), RSES (Ghorpade, Hattrup, & Lackritz, 1999), SSES (Heatherton & Polivy, 1991), DRES (van Strien, Frijters, Bergers, & Defares, 1986); DIS (Stice, 1998a), and EDI-B (Garner, Olmstead, & Polivy, 1983) fell within one standard deviation of values from past research. As presented in Table E1 to E4, coefficients alpha for all original and revised scales were acceptable, ranging from .79 to .95.

Bivariate correlations. Tables E1 to E4 present the correlations between the original and the revised measures. These correlations are described in more detail in the Method section of the main study. Thus, only a condensed description is provided here. All original measures were positively and significantly correlated with their revised counterparts. The correlations between the original and the revised measures were strong in effect size, and all values exceeded $r = .60$ (with one exception). The connection between the original and the revised appearance-related

interpersonal discrepancies subscales was $r = .31$. As described in the main study, although these variables were moderately and significantly correlated, the magnitude of their association was lower than expected. This may be attributable to the different interpersonal focus of each scale (i.e., the original BIQ scale assessed romantic partners, whereas the revised BIQ scale assessed generalized others).

Tables E1 to E4 also display the correlations among the multiple measures of each construct (e.g., the correlations among the three original and the three revised measures of intrapersonal discrepancies). Almost without exception, the correlations between the original measures and the revised measures represented the strongest associations among the multiple measures of each construct. As an example, the link between the original and the revised intrapersonal subscale of the MDI ($r = .78$) was stronger than the relation between the original intrapersonal subscale of the MDI and the other measures used to assess intrapersonal discrepancies (i.e., the BIQ and the APS-R; see Table E1). Finally, the correlations among the multiple measures of each construct were generally moderate to strong in magnitude, which may be taken as evidence of convergent validity. For instance, the measures of dietary restraint were all intercorrelated between $r = .65$ and $r = .95$ (see Table E3).

Conclusion

This psychometric study provided evidence of the psychometric adequacy and the construct validity of the revised measures used in Phase 2 of this dissertation. Results showed that the original and the revised measures were comparable. All revised and original measures were significantly correlated in the expected direction. Correlations between the original and the revised measures were moderate to strong in magnitude. Overall, this psychometric study supported the use of the revised measures in this dissertation.

Table E1. Descriptive statistics for and bivariate correlations between measures of intrapersonal discrepancies and interpersonal discrepancies.

	MDI: RA	MDI: ER	BIQ: RA	BIQ: ER	APS: RA	*M*	*SD*	*α*
RMDI: RA	.78**	.42**	.41**	.15	.66**	11.63	3.66	.86
RMDI: ER	.49**	.73**	.35**	.23*	.36**	9.47	3.49	.88
RBIQ: RA	.36**	.18	.66**	.24*	.27*	19.93	7.23	.88
RBIQ: ER	.35**	.28**	.43**	.31**	.35**	17.08	6.47	.92
RAPS: RA	.58**	.34**	.41**	.15	.68**	15.51	6.08	.92
RAPS: ER	.39**	.62**	.25**	.32**	.34**	11.53	5.57	.95
M	12.26	10.77	12.61	9.54	45.40			
SD	3.62	3.63	5.05	7.42	15.95			
α	.85	.82	.80	.93	.94			

Note. RA = intrapersonal; ER = interpersonal; MDI: RA = intrapersonal discrepancy subscale of the Multidimensional Discrepancy Inventory; MDI: ER = interpersonal discrepancy subscale of the Multidimensional Discrepancy Inventory; BIQ: RA = intrapersonal discrepancy subscale of the Body-Image Ideals Questionnaire; BIQ: ER = interpersonal discrepancy subscale of the Body-Image Ideals Questionnaire; APS: RA = intrapersonal discrepancy subscale of the Almost Perfect Scale-Revised; RMDI: RA = intrapersonal discrepancy subscale of the revised Multidimensional Discrepancy Inventory; RMDI: ER = interpersonal discrepancy subscale of the revised Multidimensional Discrepancy Inventory; RBIQ: RA = intrapersonal discrepancy subscale of the revised Body-Image Ideals Questionnaire; RBIQ: ER = interpersonal discrepancy subscale of the revised Body-Image Ideals Questionnaire; RAPS: RA = intrapersonal discrepancy subscale of the revised Almost Perfect Scale-Revised; RAPS: ER = interpersonal discrepancy subscale of the revised Almost Perfect Scale-Revised. *M* = means; *SD* = standard deviations; α = coefficients alpha. A correlation in the range of .10 signifies a small effect size; a correlation in the range of .30 signifies a medium effect size; a correlation in the range of .50 signifies a large effect size (Cohen, 1992).
*$p < .01$. **$p < .001$.

Table E2. Descriptive statistics for and bivariate correlations between measures of intrapersonal esteem and interpersonal esteem.

	RSE: RA	JFF: ER	SSP: RA	SSS: ER	*M*	*SD*	*α*
RRSE: RA	.71**	.45**	.55**	.65**	21.77	4.96	.85
RJFF: ER	.43**	.65**	.32**	.67**	20.28	5.43	.84
RSSP: RA	.63**	.31**	.74**	.51**	14.67	3.18	.83
RSSS: ER	.53**	.63**	.40**	.77**	14.74	3.63	.85
M	53.52	36.99	26.05	25.48			
SD	10.67	8.69	4.78	5.56			
α	.89	.89	.83	.87			

Note. RA = intrapersonal; ER = interpersonal; RSE: RA = Rosenberg Self-Esteem Scale (intrapersonal esteem); JFF: ER = interpersonal esteem subscale of the Janis-Field Feelings of Inadequacy Scale; SSP: RA = performance subscale of the State Self-Esteem Scale (intrapersonal esteem); SSS: ER = social subscale of the State Self-Esteem Scale (interpersonal esteem); RRSE: RA = revised Rosenberg Self-Esteem Scale (intrapersonal esteem); RJFF: ER = interpersonal esteem subscale of the revised Janis-Field Feelings of Inadequacy Scale; RSSP: RA = performance subscale of the revised State Self-Esteem Scale (intrapersonal esteem); RSSS: ER = social subscale of the revised State Self-Esteem Scale (interpersonal esteem). *M* = means; *SD* = standard deviations; α = coefficients alpha. A correlation in the range of .10 signifies a small effect size; a correlation in the range of .30 signifies a medium effect size; a correlation in the range of .50 signifies a large effect size (Cohen, 1992).
*$p < .01$. **$p < .001$.

Table E3. Descriptive statistics for and bivariate correlations between measures of dietary restraint.

	DRE	DIS	TFE	*M*	*SD*	α
RDRE	.80**	.77**	.72**	10.61	5.61	.90
RDIS	.82**	.95**	.74**	6.29	2.96	.92
RTFE	.71**	.72**	.65**	10.52	6.70	.93
M	23.07	17.95	21.84			
SD	9.72	8.14	5.46			
α	.94	.93	.87			

Note. DRE = Dutch Restrained Eating Scale (dietary restraint); DIS = Dietary Intent Scale (dietary restraint); TFE = dietary restraint subscale of the Three-Factor Eating Questionnaire; RDRE = revised Dutch Restrained Eating Scale (dietary restraint); RDIS = revised Dietary Intent Scale (dietary restraint); RTFE = dietary restraint subscale of the revised Three-Factor Eating Questionnaire. *M* = means; *SD* = standard deviations; α = coefficients alpha. A correlation in the range of .10 signifies a small effect size; a correlation in the range of .30 signifies a medium effect size; a correlation in the range of .50 signifies a large effect size (Cohen, 1992).
*$p < .01$. **$p < .001$.

Table E4. Descriptive statistics for and bivariate correlations between measures of binge eating.

	BUL	EDI	EDD	*M*	*SD*	*α*
RBUL	.75**	.64**	.63**	16.72	7.11	.87
REDI	.66**	.66**	.57**	7.46	5.05	.86
REDD	.63**	.61**	.64**	18.79	11.13	.92
M	20.85	13.86	11.77			
SD	9.04	5.88	3.56			
α	.91	.85	.79			

Note. BUL = binge eating subscale of the Bulimia Test-Revised; EDI = binge eating subscale of the Eating Disorder Inventory; EDD = binge eating subscale of the Eating Disorder Diagnostic Scale; RBUL = binge eating subscale of the revised Bulimia Test-Revised; REDI = binge eating subscale of the revised Eating Disorder Inventory; REDD = binge eating subscale of the revised Eating Disorder Diagnostic Scale. *M* = means; *SD* = standard deviations; α = coefficients alpha. A correlation in the range of .10 signifies a small effect size; a correlation in the range of .30 signifies a medium effect size; a correlation in the range of .50 signifies a large effect size (Cohen, 1992).
*$p < .01$. **$p < .001$.

APPENDIX F

REFERENCES FOR THE ABSTRACT, GENERAL INTRODUCTION, GENERAL CONCLUSION, AND ALL APPENDICES

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APPENDIX G

DEMOGRAPHICS AND MEASURES

Demographics

NOTE: IF YOU DO NOT KNOW THE EXACT ANSWER,
PLEASE PROVIDE YOUR BEST ESTIMATE

1. Your year of study in university (e.g., 1st): _____

2. Your age: _____ years

3. Your ethnicity (e.g., Asian, Caucasian/White, First Nations, etc.): _____

4. How long have you lived in Canada? _____ years

5. Your relationship status:
single _____
dating _____
separated _____
married _____
divorced _____
cohabiting _____
widowed _____
other (please specify) _____

6. What is your current weight? report either in pounds _____ or in kilograms _____

7. What is your current height? report either in feet/inches _____ or in meters/centimeters _____

8. Are you currently pregnant? (Circle your answer.) YES or NO

Hewitt and Flett's Multidimensional Perfectionism Scale (HFMPS)
by Hewitt and Flett (1991; references are contained in Appendix F on p. 199)

This measure is copyrighted and available through Multi-Health Systems (http://www.mhs.com). Sample items for each subscale are provided below as listed in Hewitt and Flett (1991).

Self-Oriented Perfectionism

It makes me uneasy to see an error in my work.

One of my goals is to be perfect in everything I do.

I never aim for perfection in my work. (reverse-keyed)

I must work to my full potential at all times.

I must always be successful at school or work.

Other-Oriented Perfectionism

I have high expectations for the people who are important to me.

I do not have very high standards for those around me. (reverse-keyed)

If I ask someone to do something, I expect it to be done flawlessly.

I can't be bothered with people who won't strive to better themselves.

The people who matter to me should never let me down.

Socially Prescribed Perfectionism

The better I do, the better I am expected to do.

My family expects me to be perfect.

Those around me readily accept that I can make mistakes too. (reverse-keyed)

The people around me expect me to succeed at everything I do.

Anything that I do that is less than excellent will be seen as poor work by those around me.

Eating Disorder Inventory Perfectionism Subscale (EDI-P)
by Garner, Olmstead, and Polivy (1983)

This is a scale which measures a variety of attitudes, feelings and behaviors. There are no right or wrong answers so try very hard to be completely honest in your answers. When completing this scale, "others" refers to individuals encountered in your daily life (e.g., friends, relatives, bosses, coworkers, classmates, spouse, boyfriend, girlfriend, etc.). Please answer each question very carefully. Thank you. Note: Certain questions in this study ask you about your parents (e.g., "My parents expect excellence of me."). If your parents are no longer alive, when responding to such questions, please think back to when your parents were alive. These questions are about the kind of person you generally are, that is, how you usually have felt or behaved over the past several years.

NEVER = 1
RARELY = 2
SOMETIMES = 3
OFTEN = 4
USUALLY = 5
ALWAYS = 6

	NEVER					ALWAYS
1. Only outstanding performance is good enough in my family	1	2	3	4	5	6
2. I try very hard to avoid disappointing others	1	2	3	4	5	6
3. I hate being less than best at things	1	2	3	4	5	6
4. My parents expect excellence of me	1	2	3	4	5	6
5. I feel that I must do things perfectly or not do them at all	1	2	3	4	5	6
6. I have extremely high goals	1	2	3	4	5	6

Frost's Multidimensional Perfectionism Scale (FMPS)
by Frost, Marten, Lahart, and Rosenblate (1990)

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree and to what extent. When completing this questionnaire, "most people," "other people," and "others" refer to individuals encountered in your daily life (e.g., friends, relatives, bosses, coworkers, classmates, spouse, boyfriend, girlfriend, etc.). If you ***strongly agree***, circle 5; if you ***strongly disagree***, circle 1; if you feel somewhere in between, circle any one of the numbers between 1 and 5. If you feel neutral or undecided the midpoint is 3. These questions are about the kind of person you generally are, that is, how you usually have felt or behaved over the past several years.

	Strongly Disagree				Strongly Agree
1. It is important to me that I be thoroughly competent in everything I do	1	2	3	4	5
2. I set higher goals than most people	1	2	3	4	5
3. Other people seem to accept lower standards from themselves than I do	1	2	3	4	5
4. I expect higher performance in my daily tasks than most people	1	2	3	4	5
5. Others punish me for doing things less than perfect	1	2	3	4	5
6. I never feel like I can meet others' expectations	1	2	3	4	5
7. My parents always have higher expectations for my future than I have	1	2	3	4	5
8. I never feel I can meet my parents' standards	1	2	3	4	5

Big Five Inventory Neuroticism Subscale (BFI-N)
by Benet-Martinez and John (1998)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others?
Please choose a number for each statement to indicate the extent to which you agree or disagree with that statement.

Disagree Strongly = 1
Disagree a little = 2
Neither agree not disagree = 3
Agree a little = 4
Agree Strongly = 5

I see myself as someone who . . .

____ 1. is emotionally stable, not easily upset

____ 2. is depressed, blue

____ 3. can be moody

____ 4. is relaxed, handles stress well

____ 5. remains calm in tense situations

____ 6. can be tense

____ 7. gets nervous easily

____ 8. worries a lot

Please check: Did you write a number in front of each statement?

Multidimensional Discrepancy Inventory (MDI)
by Flett and Hewitt (2006)

This scale asks you to estimate the extent to which actual tendencies and behaviors relate to goals, and expectancies, etc. When completing this questionnaire, "others" and "other people" refer to individuals encountered in your daily life (e.g., friends, relatives, bosses, coworkers, classmates, spouse, boyfriend, girlfriend, etc.). For each of the questions below, indicate your response by circling a number between "1" and "4," using the following scale.

1 = not at all 2 = slightly 3 = moderately 4 = very much

DURING THE PAST 24 HOURS, *TO WHAT EXTENT*...

1. Did your behaviors fall short of your expectations? 1 2 3 4
2. Did your behaviors fall short of other people's expectations? 1 2 3 4
3. Was there a gap between how you were and how you would have liked to be? 1 2 3 4
4. Was there a gap between how you were and how other people would have liked you to be? 1 2 3 4
5. Were you unable to reach your own goals? 1 2 3 4
6. Were you unable to reach the goals that others have imposed on you? 1 2 3 4
7. Were you dissatisfied with your ability to live up to your standards? 1 2 3 4
8. Were you dissatisfied with your ability to live up to the standards that other people have imposed on you? 1 2 3 4
9. Did you fall short of being the type of person you expected to be, in terms of your personal qualities? 1 2 3 4
10. Did you fall short of being the type of person that other people expected you to be, in terms of your personal qualities? .. 1 2 3 4

Body-Image Ideals Questionnaire (BIQ)
by Cash and Szymanski (1995)

Each item in this section deals with a different physical characteristic. For each item, rate the extent to which your body resembled your personal ideal for your appearance.
Before continuing, please note the difference between "actual" and ideal" in this section. For example: Your actual muscle tone refers to how your muscle tone really was DURING THE PAST 24 HOURS. However, your personal ideal for your muscle tone refers to your highest standard for your muscle tone or to your loftiest goal for your muscle tone.

DURING THE PAST 24 HOURS…

1. My actual muscle tone matched my personal ideal for my muscle tone.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree nor Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

2. My actual body proportions matched my personal ideal for my body proportions.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree nor Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

3. My actual weight matched my personal ideal for my weight.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree nor Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

4. My actual chest size matched my personal ideal for my chest size.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree nor Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

5. My actual overall physical appearance matched my personal ideal for my overall physical appearance.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree nor Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

Each item in this section deals with a different physical characteristic. For each item, rate the extent to which you believe that your body resembled other people's ideal for your appearance. When completing this section, "other people" refers to individuals encountered in your daily life (e.g., friends, relatives, bosses, coworkers, classmates, spouse, boyfriend, girlfriend, etc.). If you are not entirely sure of other people's ideal for your appearance, provide us with your best guess. Before continuing, please note the difference between "actual" and ideal" in this section. For example: Your actual muscle tone refers to how your muscle tone really was DURING THE PAST 24 HOURS. However, other people's ideal for your muscle tone refers to their highest standard for your muscle tone or to their loftiest goal for your muscle tone.

DURING THE PAST 24 HOURS…

1. My actual muscle tone matched other people's ideal for my muscle tone.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree nor Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

2. My actual body proportions matched other people's ideal for my body proportions.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree nor Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

3. My actual weight matched other people's ideal for my weight.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree nor Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

4. My actual chest size matched other people's ideal for my chest size.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree nor Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

5. My actual overall physical appearance matched other people's ideal for my overall physical appearance.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree nor Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

Almost Perfect Scale-Revised (APS-R)
by Slaney, Rice, Mobley, Trippi, and Ashby (2001)

This is a questionnaire designed to measure your feelings, thoughts and behaviors DURING THE PAST 24 HOURS. Read each item and decide whether you agree or disagree and to what extent. If you ***strongly agree***, circle 7; if you ***strongly disagree***, circle 1; if you feel somewhere in between, circle any one of the numbers between 1 and 7. If you feel neutral or undecided the midpoint is 4. When completing this questionnaire, "others" refers to individuals encountered in your daily life (e.g., friends, relatives, bosses, coworkers, classmates, spouse, boyfriend, girlfriend, etc.).

DURING THE PAST 24 HOURS…

	Strongly Disagree						Strongly Agree
1. My performance did not measure up to my standards.....	1	2	3	4	5	6	7
2. My best was not good enough for me.....	1	2	3	4	5	6	7
3. I was unable to meet others' standards for performance	1	2	3	4	5	6	7
4. I was dissatisfied with my performance	1	2	3	4	5	6	7
5. My performance did not measure up to others' standards.....	1	2	3	4	5	6	7
6. I was unable to meet my own standards for performance	1	2	3	4	5	6	7
7. Others were dissatisfied with my performance	1	2	3	4	5	6	7
8. My best was not good enough for others.....	1	2	3	4	5	6	7

State Self-Esteem Scale (SSES)
by Heatherton and Polivy (1991)

This is a questionnaire designed to measure what you were thinking DURING THE PAST 24 HOURS. There is, of course, no right answer for any statement. The best answer is what you feel was true of yourself DURING THE PAST 24 HOURS. Be sure to answer all of the items, even if you are not certain of the best answer. When completing this questionnaire, "others" and "other people" refer to individuals encountered in your daily life (e.g., friends, relatives, bosses, coworkers, classmates, spouse, boyfriend, girlfriend, etc.). Each item is scored on a 5-point scale:

1 = NOT AT ALL 2 = A LITTLE BIT 3 = SOMEWHAT
4 = VERY MUCH 5 = EXTREMELY

DURING THE PAST 24 HOURS…

1. I felt confident about my abilities	1	2	3	4	5
2. I was worried about whether I was regarded as a success or failure	1	2	3	4	5
3. I felt as smart as others	1	2	3	4	5
4. I was worried about what other people thought of me	1	2	3	4	5
5. I felt confident that I understood things	1	2	3	4	5
6. I felt concerned about the impression I was making	1	2	3	4	5
7. I felt that I had less scholastic ability than others	1	2	3	4	5
8. I was worried about looking foolish	1	2	3	4	5

Note. Items 2, 4, 6, and 8 constitute the social self-esteem subscale. Items 1, 3, 5, and 7 constitute the performance self-esteem subscale.

Rosenberg Self-Esteem Scale (RSES)
by Rosenberg (1965)

This is a scale which measures a variety of attitudes and feelings DURING THE PAST 24 HOURS. Read each item and decide whether you agree or disagree and to what extent. When completing this questionnaire, "others" refers to individuals encountered in your daily life (e.g., friends, relatives, bosses, coworkers, classmates, spouse, boyfriend, girlfriend, etc.). If you ***strongly agree***, circle 7; if you ***strongly disagree***, circle 1; if you feel somewhere in between, circle any one of the numbers between 1 and 7. If you feel neutral or undecided the midpoint is 4.

DURING THE PAST 24 HOURS…

	Strongly Disagree						Strongly Agree
1. I felt that I was a person of worth, at least on an equal basis with others	1	2	3	4	5	6	7
2. I was inclined to feel that I was a failure	1	2	3	4	5	6	7
3. I felt I did not have much to be proud of	1	2	3	4	5	6	7
4. I had a positive attitude toward myself	1	2	3	4	5	6	7

Janis-Field Feelings of Inadequacy Scale (JFFIS)
by Janis and Field (1959)

This is a scale which measures a variety of behaviors, thoughts, and feelings DURING THE PAST 24 HOURS. Read each item and decide whether you agree or disagree and to what extent. When completing this questionnaire, "other people" refers to individuals encountered in your daily life (e.g., friends, relatives, bosses, coworkers, classmates, spouse, boyfriend, girlfriend, etc.). If you ***strongly agree***, circle 7; if you ***strongly disagree***, circle 1; if you feel somewhere in between, circle any one of the numbers between 1 and 7. If you feel neutral or undecided the midpoint is 4.

DURING THE PAST 24 HOURS…

	Strongly Disagree						Strongly Agree
1. I worried about how well I got along with other people	1	2	3	4	5	6	7
2. When in a group of people, I had trouble thinking of the right things to talk about	1	2	3	4	5	6	7
3. I worried about whether other people liked to be with me	1	2	3	4	5	6	7
4. I was troubled by my shyness	1	2	3	4	5	6	7

Depressive Affect

Below is a list of words or phrases. Please read each one carefully. For each word or phrase, circle one number which best describes your experience

DURING THE PAST 24 HOURS.

The numbers refer to the following descriptive phrases.

0 = Not at all
1 = A little
2 = Moderately
3 = Quite a bit
4 = Extremely

1. discouraged	0	1	2	3	4
2. depressed.....	0	1	2	3	4
3. hopeless.....	0	1	2	3	4
4. blue.....	0	1	2	3	4
5. lifeless	0	1	2	3	4
6. awful	0	1	2	3	4
7. worthless	0	1	2	3	4
8. sad	0	1	2	3	4
9. miserable.....	0	1	2	3	4
10. downcast	0	1	2	3	4
11. cheerless.....	0	1	2	3	4
12. failure	0	1	2	3	4

Note. Items 1, 3, 7, and 8 are from the Profile of Mood States-Depression subscale (POMS-D; McNair, Lorr, & Droppleman, 1992). Items 2, 5, 9, and 12 are from the Depression Adjective Checklist Form G (DACL-G; Lubin, 1965). Items 4, 6, 10, and 11 are from the Depression Adjective Checklist Form E (DACL-E; Lubin, 1965).

Dutch Restrained Eating Scale (DRES)
by van Strien, Frijters, Bergers, and Defares (1986)

This is a questionnaire designed to measure your thoughts and behaviors DURING THE PAST 24 HOURS. There is, of course, no right answer for any statement. The best answer is what you feel was true of yourself DURING THE PAST 24 HOURS. Be sure to answer all of the items, even if you are not certain of the best answer. If you ***strongly agree***, circle 5; if you ***strongly disagree***, circle 1; if you feel somewhere in between, circle any one of the numbers between 1 and 5. If you feel neutral or undecided the midpoint is 3.

DURING THE PAST 24 HOURS…

	Strongly Disagree				Strongly Agree
1. I refused food or drink offered because I was concerned about my weight	1	2	3	4	5
2. I deliberately ate less in order not to become heavier	1	2	3	4	5
3. I tried not to eat between meals because I was watching my weight	1	2	3	4	5
4. In the evening, I tried not to eat because I was watching my weight	1	2	3	4	5
5. I took into account my weight with what I ate	1	2	3	4	5

Dietary Intent Scale (DIS)
by Stice (1998a)

This is a questionnaire designed to measure your thoughts and behaviors DURING THE PAST 24 HOURS. There is, of course, no right answer for any statement. The best answer is what you feel was true of yourself DURING THE PAST 24 HOURS. Be sure to answer all of the items, even if you are not certain of the best answer. If you ***strongly agree***, circle 5; if you ***strongly disagree***, circle 1; if you feel somewhere in between, circle any one of the numbers between 1 and 5. If you feel neutral or undecided the midpoint is 3.

DURING THE PAST 24 HOURS…

	Strongly Disagree				Strongly Agree
1. I sometimes avoided eating in an attempt to control my weight	1	2	3	4	5
2. I skipped a meal (or meals) in an effort to control my weight.....	1	2	3	4	5
3. I ate only one or two meals to try to limit my weight.....	1	2	3	4	5

Three-Factor Eating Questionnaire (TFEQ-R)
by Stunkard and Messick (1985)

This is a questionnaire designed to measure your thoughts and behaviors DURING THE PAST 24 HOURS. Read each item and decide whether you agree or disagree and to what extent. If you ***strongly agree***, circle 7; if you ***strongly disagree***, circle 1; if you feel somewhere in between, circle any one of the numbers between 1 and 7. If you feel neutral or undecided the midpoint is 4.

DURING THE PAST 24 HOURS…

	Strongly Disagree						Strongly Agree
1. I deliberately took small helpings as a means of controlling my weight	1	2	3	4	5	6	7
2. I stopped eating when I was not really full as a conscious means of limiting the amount that I ate	1	2	3	4	5	6	7
3. I consciously held back at meals in order not to gain weight	1	2	3	4	5	6	7
4. I consciously ate less than I wanted	1	2	3	4	5	6	7

Bulimia Test-Revised (BULIT-R)
by Thelen, Farmer, Wonderlich, and Smith (1991)

Answer each question by circling the appropriate number. Please respond to each item as honestly as possible; remember, all of the information you provide will be kept strictly confidential. When completing this questionnaire, "eating binge," "binge eat," etc. refer to the rapid and uncontrollable consumption of a large amount of food in a short period of time, usually less than two hours.

1. During the past 24 hours, did you feel you had control over the amount of food you consumed?
    1. Most or all of the time
    2. A lot of the time
    3. Occasionally
    4. Rarely
    5. Never

2. During the past 24 hours, there were times when I rapidly ate a very large amount of food.
    1. Strongly disagree (i.e., I did not rapidly eat a very large amount of food during the past 24 hours)
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly agree

3. Most people I know would be amazed if they knew how much food I consumed at one sitting (during the past 24 hours).
    1. Without a doubt
    2. Very probably
    3. Probably
    4. Possibly
    5. No

4. During the past 24 hours, I ate a lot of food when I wasn't even hungry.
    1. Strongly disagree (i.e., I did not eat a lot of food when I wasn't even hungry during the past 24 hours)
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly agree

5. During the past 24 hours, when engaged in an eating binge, I tended to eat foods that were high in carbohydrates (sweets and starches).
    1. Strongly disagree (i.e., I didn't binge eat)
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly agree

6. Based on my behavior during the past 24 hours, I would label myself a "compulsive eater" (one who engages in episodes of uncontrolled eating).
    1. Absolutely
    2. Yes
    3. Yes, probably
    4. Yes, possibly
    5. No, probably not

7. During the past 24 hours, when consuming a large quantity of food, at what rate of speed did you eat?
    1. More rapidly than most people have ever eaten in their lives
    2. A lot more rapidly than most people
    3. A little more rapidly than most people
    4. About the same rate as most people
    5. More slowly than most people (or not applicable)

8. During the past 24 hours, right after an eating binge I felt:
    1. So fat and bloated I couldn't stand it
    2. Extremely fat
    3. Fat
    4. A little fat
    5. OK about how my body looked or I didn't binge eat

9. During the past 24 hours, did you binge eat (eat uncontrollably to the point of stuffing yourself)?
    1. Strongly disagree (i.e., I didn't binge eat)
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly agree

Eating Disorder Inventory Bulimia Subscale (EDI-B)
by Garner, Olmstead, and Polivy (1983)

This is a scale which measures a variety of attitudes, feelings and behaviors DURING THE PAST 24 HOURS. There are no right or wrong answers so try very hard to be completely honest in your answers. Results are completely confidential. When completing this scale, "others" refers to individuals encountered in your daily life (e.g., friends, relatives, bosses, coworkers, classmates, spouse, boyfriend, girlfriend, etc.).

If you ***strongly agree***, circle 7; if you ***strongly disagree***, circle 1; if you feel somewhere in between, circle any one of the numbers between 1 and 7. If you feel neutral or undecided the midpoint is 4. When completing this questionnaire, "eating binges," "an eating binge," "bingeing," etc. refer to the rapid and uncontrollable consumption of a large amount of food in a short period of time, usually less than two hours.

Please answer each question *very* carefully. Thank you.

DURING THE PAST 24 HOURS…

	Strongly Disagree						Strongly Agree
1. I stuffed myself with food	1	2	3	4	5	6	7
2. I went on an eating binge (or eating binges) where I felt that I could not stop	1	2	3	4	5	6	7
3. I thought about bingeing (overeating)	1	2	3	4	5	6	7
4. I ate moderately in front of others and stuffed myself when they were gone	1	2	3	4	5	6	7

Eating Disorder Diagnostic Scale (EDDS)
by Stice, Telch, and Rizvi (2000)

This is a scale which measures a variety of feelings and behaviors DURING THE PAST 24 HOURS. Read each item and decide whether you agree or disagree and to what extent. When completing this questionnaire, "other people" refers to individuals encountered in your daily life (e.g., friends, relatives, bosses, coworkers, classmates, spouse, boyfriend, girlfriend, etc.). If you ***strongly agree***, circle 7; if you ***strongly disagree***, circle 1; if you feel somewhere in between, circle any one of the numbers between 1 and 7. If you feel neutral or undecided the midpoint is 4.

DURING THE PAST 24 HOURS…

	Strongly Disagree						Strongly Agree
1. There were times when I ate what other people would regard as an unusually large amount of food (e.g., a litre of ice cream) given the circumstances	1	2	3	4	5	6	7
2. There were times when I felt I couldn't stop eating or control what or how much I was eating	1	2	3	4	5	6	7
3. There were times when I ate an unusually large amount of food and experienced a loss of control	1	2	3	4	5	6	7
4. There were times when I ate much more rapidly than normal	1	2	3	4	5	6	7
5. There were times when I ate until I felt uncomfortably full	1	2	3	4	5	6	7
6. There were times when I ate large amounts of food when I didn't feel physically hungry	1	2	3	4	5	6	7
7. There were times when I ate alone because I was embarrassed by how much I was eating	1	2	3	4	5	6	7

APPENDIX H

CONSENT FORMS, DEBRIEFING FORMS, AND ETHICS APPROVAL

The following is the consent form for the diary study conducted at U of S:

Personality Traits and Eating Behaviors
Consent Form

Title
Personality Traits and Eating Behaviors

Name of Primary Investigator
Peter A. Hall
Department of Psychology
University of Saskatchewan
306-966-6671
peter.hall@usask.ca

Purpose
The purpose of this investigation is to understand how personality traits relate to eating behaviors.

Benefits
There are no particular benefits associated with participation in this research project. However, the information collected will be of benefit to society as a whole in that it may help to inform how we understand the relationship between personality traits and eating behaviors. It is also possible that you may gain some knowledge of experimental procedure and measurement of psychological constructs as a result of your participation.

Procedures
This study is divided into two phases: A personality assessment phase and a daily diary phase. During the personality assessment phase, you will be asked to respond to demographic questions and standardized questionnaires. The personality assessment phase will take roughly 30 minutes of your time and will occur before the daily diary phrase. During the daily diary phase, you will be asked to complete a web-based diary (i.e., a web-based questionnaire) once per day for seven consecutive days. Every evening before going to sleep, you will be asked to complete a diary. You will be asked to return your web-based diary to us every evening over the Internet. In total, the daily diary phase will take roughly 60 minutes of your time (i.e., roughly eight minutes per day). All information provided will be kept strictly confidential. All questionnaires will be assigned a code number (e.g., 26) for identification purposes. Immediately upon receipt of your

questionnaires, your name will be removed. Thus, your responses will remain anonymous and confidential. Participant questionnaires will be stored in a secure and locked location.

Risks and Ability to Withdraw
There are no anticipated risks associated with your participation in this study. If, however, for any reason you choose to withdraw from the study, you may do so at any time (any data collected from you up to that point will be destroyed if returned to us). The name, email address, and number of the primary investigator have been provided on this form, and you are welcome to contact him if you have any questions about the study or any risks associated with it. Finally, there is a possibility that answering questions in this study may distress you. If you are distressed by questions in this study, please contact Dr. Peter Hall at 306-966-6671 or at peter.hall@usask.ca. In exchange for your participation in this study, you will be given $5.00 and two participant pool credits worth two percent to be added to your overall introductory psychology mark. You will receive $5.00 and two participant pool credits worth two percent to be added to your overall introductory psychology mark even if you choose to withdraw from this study.

Confidentiality
During the daily diary phase of this study you will be identified using only a code number (e.g., 26). When you submit your structured daily diaries you will fill in your code number (e.g., 26) with each submission. In doing so, your anonymity and confidentiality will be protected. All data collected will be stored electronically using only an anonymous identification number; no names will be part of this data file. Any paper copies of data will be kept in a secure and locked room, with only the principal investigator and students/research assistants under his direction having access. In accordance with university regulations, all data will be stored for a minimum of 5 years. Data will be stored in Room 174, Department of Psychology, Arts Building, University of Saskatchewan. Every effort will be made to insure that participants are not individually identifiable in the stored data.

Use of Data and Dissemination of Results
Data will be used for research purposes only, and no data will be presented in such a way as to allow for identification of any individual. Aggregate (i.e., summarized) findings will be disseminated via conference presentations, scientific journals, or other scholarly publications.

Additional Information
If any new information comes to light during this investigation that might influence your decision to continue in this investigation, you will be informed of the information and asked whether or not you want to continue with the investigation.

Debriefing
Upon completion of this study, you will be able to read a sheet outlining the purpose of this investigation. This sheet will also review procedures designed to ensure confidentiality during data collection and storage. Any questions you have upon completion of this study may be directed toward Dr. Peter A. Hall over the phone or via email. If you are interested, information will be provided as to how you can learn about the final results of this study.

Contact Person
If you have any questions about the study or your participation in it, please contact Dr. Peter Hall at 306-966-6671 or at peter.hall@usask.ca. Additionally, you may contact the Office of Research Services at 306-966-2084 if you have any questions regarding your rights as a participant in a research project.

I have read and understood the description of this investigation and I agree to participate. I have had the investigation explained to me and I have had any questions I had about the investigation answered. By signing below I acknowledge that I am willing to participate in this investigation on personality traits and eating behaviors and that I have received a copy of the consent form for my records.

This research was approved by the University of Saskatchewan Behavioral Research Ethics Board on July 14, 2004.

_____
Name of participant (please print)

_____
Signature of participant

_____
Date

_____
Witness

The following is the debriefing form for the diary study conducted at U of S:

Personality Traits and Eating Behaviors
Debriefing Form

Title
Personality Traits and Eating Behaviors

Name of Primary Investigator
Peter A. Hall
Department of Psychology
University of Saskatchewan
306-966-6671
peter.hall@usask.ca

Purpose
The purpose of this investigation is to determine whether there is a relationship between the personality trait of perfectionism and binge eating behavior (i.e., uncontrolled overeating). In this study, we expect to find that perfectionistic individuals who experience either low self-esteem or negative mood on one day are likely to experience binge eating behavior on the next day. We also expect to find that perfectionistic individuals hold rigid dietary standards that, once abandoned, result in episodes of binge eating behavior.

Confidentiality
All data collected will be stored electronically using only an anonymous identification number; no names will be part of this data file. Any paper copies of data will be kept in a secure and locked room, with only the principal investigator and students/research assistants under his direction having access. In accordance with university regulations, all data will be stored for a minimum of 5 years. Data will be stored in Room 174, Department of Psychology, Arts Building, University of Saskatchewan. Every effort will be made to insure that participants are not individually identifiable in the stored data.

Use of Data and Dissemination of Results
Data will be used for research purposes only, and no data will be presented in such a way as to allow for identification of any individual. Aggregate (i.e., summarized) findings will be disseminated in journal articles, conference presentations, and posters.

Contact Person
If you have any questions about the study or your participation in it, please contact Peter Hall at 306-966-6671. Additionally, you may contact the Office of Research Services at 306-966-2084 if you have any questions regarding your rights as a participant in a research project.

The following is the consent form for the diary study conducted at UBC:

Personality Traits and Eating Behaviors
Informed Consent

Principal Investigator: Dr. Paul Hewitt, 604-822-5827, phewitt@psych.ubc.ca

The purpose of this investigation is to understand how personality traits relate to eating behaviors. If you choose to participate in this study, you will be asked to fill out one paper set of questionnaires and to complete structured daily reports (diaries) once a day (around bedtime) for 7 consecutive days through an on-line website. The initial questionnaire will be completed in the lab; the diaries can be completed from a location of your choice via the internet. The questionnaires will take approximately 45 minutes and it is estimated to take less than 10 minutes a day to complete the diaries (1 hour and 10 minutes in total for the diaries). The total length of time commitment will be approximately 2 hours. You will receive 2 bonus credits for your participation.

All information is confidential and will be used for research purposes only. Your unique data will not be shared with anyone. The information you share with us will be kept confidential. Your name will not appear on the questionnaire or diaries; you will be given a login ID and password to identify yourself. This ID number will only be associated with your email address, phone number and first name to allow the research team to provide you with daily reminders. Only the research team will have access to this information and this information will be destroyed upon completion of the study. This consent form will not be attached to your data. The on-line questionnaires are hosted on a secure website on the Department of Psychology server. The data will be removed from the website and stored securely by the principal investigator on disk following completion of data collection. Questionnaires will be stored securely in a locked filing cabinet in the principal investigator's lab and will not contain any identifying information. Finally, there is a possibility that answering questions in this study may distress you. If you are distressed by questions in this study, please contact Dr. Paul Hewitt at phewitt@psych.ubc.ca or 604-822-5827.

You are free to refuse participation or to withdraw from participation without penalty of any kind at any time. Signing below indicates that you understand to your satisfaction the information regarding participation in the research project and agree to participate. In no way does this waive your legal rights nor release the investigators or involved institutions from their legal and professional responsibilities. You are free to not answer specific items or questions in interviews or on questionnaires. Please feel free to ask for clarification or new information throughout your participation. If you have further questions concerning matters related to this research, please contact: Dr. Paul Hewitt, Perfectionism and Psychopathology Laboratory, 604-822-0932. If you are concerned about your rights or treatment as a research subject you may contact the Research Subject Information Line in the UBC Office of Research Services at 604-822-8598.

Participant _____ Date _____
Printed Name _____ Date _____
A copy of this consent form has been given to you to keep for your records and reference.

The following is the debriefing form for the diary study conducted at UBC:

Debriefing Form
Personality Traits and Eating Behaviors

Thank you for participating in our study. By completing the questionnaire you have provided us with valuable information for our research project.

The purpose of this investigation is to determine whether there is a relationship between the personality trait of perfectionism and binge eating behavior (i.e., uncontrolled overeating). In this study, we expect to find that perfectionistic individuals who experience either low self-esteem or negative mood on one day are likely to experience binge eating behavior on the next day. We also expect to find that perfectionistic individuals hold rigid dietary standards that, once abandoned, result in episodes of binge eating behavior.

The following article provides some relevant information on perfectionism, one of the personality constructs examined in the present study.

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

If you have any further questions about this project, please feel free to call the Perfectionism and Psychopathology Lab, Department of Psychology, UBC. Tel. # 604-822-0932 or see our website at http://www.psych.ubc.ca/~hewittlab/.

Thank you for your participation.

Paul Hewitt, Ph.D., Principal Investigator, phewitt@psych.ubc.ca, 604-822-5827

The following is the consent form for the psychometric study conducted at U of S (see Appendix E on p. 190):

Personality Traits and Eating Behaviors
Consent Form

Title
Personality Traits and Eating Behaviors

Name of Primary Investigator
Peter A. Hall
Department of Psychology
University of Saskatchewan
306-966-6671
peter.hall@usask.ca

Purpose
The purpose of this investigation is to understand the extent to which short-term feelings, emotions, and behaviors overlap with long-term feelings, emotions, and behaviors.

Benefits
There are no particular benefits associated with participation in this research project. However, the information collected will be of benefit to society as a whole in that it may help to inform how we understand eating behaviors. It is also possible that you may gain some knowledge of experimental procedure and measurement of psychological constructs as a result of your participation.

Procedures
You will be asked to respond to demographic questions and standardized questionnaires. This will take roughly 1 hour of your time. All questionnaires will be assigned a code number (e.g., 26) for identification purposes. Immediately upon receipt of your questionnaires, your name will be removed. Thus, your responses will remain anonymous and confidential. Participant questionnaires will be stored in a secure and locked location.

Risks and Ability to Withdraw
There are no anticipated risks associated with your participation in this study. If, however, for any reason you choose to withdraw from the study, you may do so at any time (any data collected from you up to that point will be destroyed if returned to us). The name, email address, and number of the primary investigator have been provided on this form, and you are welcome to contact him if you have any questions about the study or any risks associated with it. Finally, there is a possibility that answering questions in this study may distress you. If you are distressed by questions in this study, please contact Dr. Peter Hall at 306-966-6671 or at peter.hall@usask.ca. In exchange for your participation in this study, you will be given two participant pool credits worth two percent to be added to your overall introductory psychology mark. You will receive two participant pool credits worth two percent to be added to your overall introductory psychology mark even if you choose to withdraw from this study.

Confidentiality
You will be identified using only a code number (e.g., 26). In doing so, your anonymity and confidentiality will be protected. All data collected will be stored electronically using only an anonymous identification number; no names will be part of this data file. Any paper copies of data will be kept in a secure and locked room, with only the principal investigator and students/research assistants under his direction having access. In accordance with university regulations, all data will be stored for a minimum of 5 years. Data will be stored in Room 174, Department of Psychology, Arts Building, University of Saskatchewan. Every effort will be made to insure that participants are not individually identifiable in the stored data.

Use of Data and Dissemination of Results
Data will be used for research purposes only, and no data will be presented in such a way as to allow for identification of any individual. Aggregate (i.e., summarized) findings will be disseminated via conference presentations, scientific journals, or other scholarly publications.

Additional Information
If any new information comes to light during this investigation that might influence your decision to continue in this investigation, you will be informed of the information and asked whether or not you want to continue with the investigation.

Debriefing
Upon completion of this study, you will be able to read a sheet outlining the purpose of this investigation. This sheet will also review procedures designed to ensure confidentiality during data collection and storage. Any questions you have upon completion of this study may be directed toward Dr. Peter A. Hall over the phone or via email.

Contact Person
If you have any questions about the study or your participation in it, please contact Dr. Peter Hall at 306-966-6671 or at peter.hall@usask.ca. Additionally, you may contact the Office of Research Services at 306-966-2084 if you have any questions regarding your rights as a participant in a research project.

I have read and understood the description of this investigation and I agree to participate. I have had the investigation explained to me and I have had any questions I had about the investigation answered. By signing below I acknowledge that I am willing to participate in this investigation on eating behaviors and that I have received a copy of the consent form for my records.

This research was approved by the University of Saskatchewan Behavioral Research Ethics Board on July 14, 2004.

_____
Name of Participant (please print)

_____
Signature of Participant

_____

Date

_____

Witness

The following is the debriefing form for the psychometric study conducted at U of S (see Appendix E on p. 190):

Personality Traits and Eating Behaviors
Debriefing Form

Title
Personality Traits and Eating Behaviors

Name of Primary Investigator
Peter A. Hall
Department of Psychology
University of Saskatchewan
306-966-6671
peter.hall@usask.ca

Purpose
The purpose of this investigation is to understand the extent to which short-term feelings, emotions, and behaviors overlap with long-term feelings, emotions, and behaviors. In this study, we expect to find that short-term feelings, emotions, and behaviors (e.g., self-esteem, body image, and eating behaviors during the past 24 hours) are positively, strongly, and significantly associated with long-term feelings, emotions, and behaviors (e.g., self-esteem, body image, and eating behaviors during the past 6 months or over the past several years). We also expect to learn more about the psychometrics (e.g., validity and reliability) of the questionnaires used in this study.

Confidentiality
All data collected will be stored electronically using only an anonymous identification number; no names will be part of this data file. Any paper copies of data will be kept in a secure and locked room, with only the principal investigator and students/research assistants under his direction having access. In accordance with university regulations, all data will be stored for a minimum of 5 years. Data will be stored in Room 174, Department of Psychology, Arts Building, University of Saskatchewan. Every effort will be made to insure that participants are not individually identifiable in the stored data.

Use of Data and Dissemination of Results
Data will be used for research purposes only, and no data will be presented in such a way as to allow for identification of any individual. Aggregate (i.e., summarized) findings will be disseminated in journal articles, conference presentations, and posters.

Contact Person
If you have any questions about the study or your participation in it, please contact Peter Hall at 306-966-6671 or at peter.hall@usask.ca. Additionally, you may contact the Office of Research Services at 306-966-2084 if you have any questions regarding your rights as a participant in a research project.