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The Perfectionism Model of Binge Eating: Tests of an Integrative Model

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This study proposes, tests, and supports the perfectionism model of binge eating (PMOBE), a model aimed at explaining why perfectionism is related to binge eating. According to this model, socially prescribed perfectionism (SPP) confers risk for binge eating by generating exposure to 4 triggers of binge episodes: interpersonal discrepancies, low interpersonal esteem, depressive affect, and dietary restraint. In testing the PMOBE, a daily diary was completed by 566 women for 7 days. Predictions derived from the PMOBE were supported, with tests of mediation suggesting that the indirect effect of SPP on binge eating through triggers of binge episodes was significant. Reciprocal relations were also observed, with certain triggers of binge episodes predicting binge eating (and vice versa). Results supported the incremental validity of the PMOBE over and above self-oriented perfectionism and neuroticism and the generalizability of this model across Asian and European Canadian participants. The PMOBE offers a novel view of individuals with high levels of SPP as active agents who raise their risk of binge eating by generating conditions in their daily lives that are conducive to binge episodes.

Keywords: perfectionism, social maladjustment, depressive affect, dietary restraint, binge eating

A large scholarly literature has accumulated suggesting perfectionism is linked to various forms of psychopathology, including suicide behaviors (Hewitt, Flett, Sherry, & Caelian, 2006), depression (Dunkley, Zuroff, & Blankstein, 2003), and interpersonal problems (Sherry, Hewitt, Flett, Lee-Baggley, & Hall, 2007). Although connected with many forms of psychopathology, the unrealistic expectations, fear of others' scrutiny, and harsh self-criticism that characterize perfectionism appear especially conducive to disordered eating (e.g., Bardone-Cone et al., 2007; Bruch, 1979; Shafran, Cooper, & Fairburn, 2002; Stice, 2002; Vohs, Bardone, Joiner, Abramson, & Heatherton, 1999). Perfectionism is salient before, during, and after episodes of disordered eating, suggesting it is an antecedent and a concomitant, but not an epiphenomenon or a consequence, of disordered eating (Joiner, Heatherton, Rudd, & Schmidt, 1997; D. Stein et al. 2002). Evidence has thus converged to suggest perfectionism may play a key role in generating and in coordinating the symptoms observed in eating disorders.

Investigation into perfectionism and disordered eating has, for the most part, focused on anorexia or bulimia. However, there is growing recognition that perfectionism is also important to binge eating (e.g., Bardone-Cone, Abramson, Vohs, Heatherton, & Joiner, 2006; Pearson & Gleaves, 2006; Pratt, Telch, Labouvie, Wilson, & Agras, 2001). Binge eating—rapidly and uncontrollably eating a large amount of food in a short period of time—is a core feature of disordered eating and a form of health-damaging behavior (Wilfley, Wilson, & Agras, 2003). Binge eating is also a key symptom of bulimia (Fairburn, Cooper, & Shafran, 2003). However, bulimia is conceptualized as a broader symptom pattern, including not only binge eating but also compensatory behavior (e.g., purging to avoid weight gain) and concerns over body shape and weight (American Psychiatric Association, 2000). Consistent with calls to better understand binge eating (Striegel-Moore et al., 2007; Wilfley, Bishop, Wilson, & Agras, 2007), in the present study we focused on the role of perfectionism in binge eating.

Binge eating is conceptualized and measured as a dimensional construct in the present study, with binge eating understood as lying along a continuum wherein individuals differ in terms of the frequency and the intensity of their binge eating (see Stice, Killen, Hayward, & Taylor, 1998). Both full-syndrome and subthreshold binge eating are tied to weight gain, functional impairment, and comorbid psychopathology (Fitzgibbon, Sánchez-Johnsen, & Martinovich, 2003). Evidence also suggests subthreshold eating pathology is common among 16- to 20-year-old women, a time when many women leave home and attend university (Taylor et al., 2006). Indeed, rates of binge eating appear to peak while women are in university, with evidence suggesting between 32% (Keel, Baxter, Heatherton, & Joiner, 2007) and 48% (Striegel-Moore, Silberstein, Grunberg, & Rodin, 1990) of undergraduate women engage in binge eating. Such data suggest a need for a model that would bring greater clarity and coherence to researchers' understanding of the personality traits and the environmental factors involved in binge eating.

Perfectionism and Binge Eating

Several leading models of disordered eating suggest that perfectionism and binge eating are associated (Abramson, Bardone-Cone, Vohs, Joiner, & Heatherton, 2006; Fairburn et al., 2003). For instance, Heatherton and Baumeister's (1991) escape theory of binge eating asserts that individuals who binge eat hold rigid, high self-standards and view others' expectations as excessive. Consis-

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tent with such models, research suggests that perfectionism is connected with binge eating (e.g., Striegel-Moore et al., 2005).

Among models of perfectionism and binge eating, the three-factor interactive model of binge eating and bulimia is notable for its strong support. This model asserts high perfectionism, high body dissatisfaction, and low self-esteem (or low self-efficacy) interact to predict increased levels of binge eating or bulimia (Abramson et al., 2006; Bardone, Vohs, Abramson, Heatherton, & Joiner, 2000; Bardone-Cone et al., 2006; Joiner et al., 1997; Vohs et al., 1999, 2001). This model thus specifies when binge eating or bulimia is likely to occur and suggests perfectionism confers risk for binge eating in conjunction with other variables.

Limitations of Existing Studies

Although the three-factor interactive model represents a valuable contribution, there is still much to learn about the perfectionism–binge eating relation. For instance, studies in this area presently emphasize moderation models, which clarify when (i.e., the conditions under which)—but not why (i.e., the mechanisms through which)—perfectionism results in binge eating. Thus, there is presently no mediational model explaining *why or how* perfectionism is related to binge eating. Furthermore, Garner, Olmstead, and Polivy's (1983) six-item perfectionism scale is typically used in studies of perfectionism and binge eating, which may be too brief to adequately measure the perfectionism construct (Bardone-Cone, 2007; Chang, Ivezaj, Downey, Kashima, & Morady, 2008). Moreover, Garner et al.'s (1983) scale is typically represented as a unidimensional measure, despite evidence indicating this scale has a multidimensional structure involving both self-oriented and socially prescribed dimensions of perfectionism (Joiner & Schmidt, 1995; Sherry, Hewitt, Besser, McGee, & Flett, 2004). Given evidence pointing toward an important distinction between self-oriented perfectionism (SOP) and socially prescribed perfectionism (SPP; e.g., Hewitt & Flett, 1991), there is a need for research on binge eating wherein perfectionism is conceptualized as a multidimensional construct (see also Bardone-Cone, 2007). Many studies of perfectionism and binge eating are also limited because they are cross-sectional or atheoretical. Cross-sectional designs fail to clarify temporal relations, and, without a clearly articulated model, research on perfectionism and binge eating is unlikely to be incremental or to inform treatment.

Little is also presently known about perfectionism and binge eating when studied on a day-to-day basis. Perfectionism may generate relatively minor, but frequently occurring, daily experiences that predispose various problems (Dunkley et al., 2003), including binge eating. Investigating perfectionism and binge eating on a daily basis may also reduce biased recall by measuring events closer to their actual occurrence. Research indicates that self-report data involving longer term retrospective recall (e.g., several weeks) underestimate the frequency of binge eating (Bardone, Krahn, Goodman, & Searles, 2000), suggesting merit in a daily diary approach.

In summary, large gaps still exist in the perfectionism-disordered eating literature, especially regarding how or why perfectionism results in binge eating. We begin to fill these gaps in the present study by proposing the perfectionism model of binge eating (PMOBE) and by testing this new model using an Internet-based structured daily diary design.

The PMOBE

Perfectionism in the PMOBE

Evidence suggests perfectionism may be understood as a multidimensional construct (see Hewitt, Flett, Besser, Sherry, & McGee, 2003). Across various models of perfectionism, one consistently observable distinction is between self-imposed and socially based dimensions of perfectionism (e.g., Chang, 2006a; Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991; Joiner & Schmidt, 1995). This distinction is central to Hewitt and Flett's (1991) conceptualization of perfectionism, making their work well suited to a model such as the PMOBE wherein social factors figure prominently (see the Structure and Process in the PMOBE section).

According to Hewitt and Flett (1991), perfectionism involves three dimensions: SPP (i.e., perceiving that others are demanding perfection of oneself), SOP (i.e., demanding perfection of oneself), and other-oriented perfectionism (i.e., demanding perfection of others).[1] SOP is often weakly or inconsistently related to psychological distress and may, at times, be linked to positive outcomes (Chang, 2006b). In contrast, SPP is consistently tied to psychological distress (Hewitt & Flett, 2002). There is also evidence suggesting that SPP and SOP are uniquely and differentially related to various outcomes (Hewitt et al., 2003). For example, studies indicate that failing to distinguish between SPP and SOP may distort or suppress unique information in predicting disordered eating (Sherry et al., 2004).

Whereas SOP is often linked with a strong focus on achievement, SPP tends to involve a preoccupation with other people and dysfunction in the social domain (Hewitt & Flett, 1991). SPP is tied to many forms of relational disharmony, including hostility, social hassles, loneliness, and marital difficulties (Habke & Flynn, 2002). Indeed, data collected from multiple sources (e.g., informant reports provided by spouses; Haring, Hewitt, & Flett, 2003) and based on multiple methods (e.g., physiological responses during social interactions; Hewitt, Habke, Lee-Baggley, Sherry, & Flett, 2008) suggest that persons high in SPP appear chronically distressed by and disconnected from others in their social environment.

Structure and Process in the PMOBE

Individuals high in SPP appear more likely to perceive and/or to encounter negative and stressful experiences in their daily lives (Dunkley et al., 2003). In particular, persons with high levels of SPP appear likely to see other people as critical of them and as disappointed in them (Hewitt et al., 2006). Consistent with Allport's (1937) notion that personality is capable of "rendering many stimuli functionally equivalent" (p. 295), the PMOBE asserts that, across many social situations and interactions, individuals high in SPP appear to interpret diverse social stimuli similarly and negatively (Habke & Flynn, 2002). To persons with high levels of SPP, a glance, an innocuous gesture, and a supportive comment may all seem loaded with pressure, criticism, or rejection. Through such appraisals and experiences, it is proposed that individuals high in

[1] Other-oriented perfectionism is no longer mentioned, as evidence suggests it is unrelated to eating disorders (e.g., Hewitt et al., 2003).

SPP may actually create situations and outcomes conducive to binge eating.

The PMOBE also draws on clinical observations (Bruch, 1973) and empirical findings (Bardone-Cone, 2007) indicating that SPP is an important contributor to binge eating. According to the PMOBE, SPP is a personality risk factor for binge eating that encapsulates several core attributes of, or key concerns for, persons who binge eat. In her foundational observations of patients, Bruch (1979) described familial, peer, and societal pressure to be perfect as centrally involved in binge eating. The need for approval and sensitivity to rejection accompanying high levels of SPP (Flett, Hewitt, & De Rosa, 1996) are also generally consistent with the social concerns and evaluative fears that are seen as part of the premorbid personality structure of persons who binge eat (Stein et al., 2002). SPP also resembles other central personality features of persons who binge eat, including a diminished sense of personal agency and a feeling one is controlled by and/or subject to others' demands (Sherry, Hewitt, Besser, Flett, & Klein, 2006). In the PMOBE, SPP is thus viewed as a personality trait that encompasses salient aspects of the underlying personality structure of those who engage in binge eating.

Empirical findings indicate that SPP and SOP are both implicated in disordered eating (Bardone-Cone et al., 2007). Several authors have made arguments and provided evidence suggesting that SPP and SOP are differentially related to disordered eating (Shafran et al., 2002), with SPP seen as more strongly linked to binge eating and bulimia (Pearson & Gleaves, 2006) and with SOP viewed as more strongly linked to anorexia (Shafran, Lee, Payne, & Fairburn, 2006). This issue is, however, far from resolved, as such a pattern of differential relations has not been observed in all studies (Bardone-Cone, 2007). Moreover, despite evidence of a connection between SPP and binge eating (Pratt et al., 2001), the factors that explain how or why persons high in SPP are vulnerable to binge eating are not well understood and need explication.

In the present study, the PMOBE is proposed as a conceptual framework capable of filling this void. According to this new model, SPP predisposes binge eating over time. At its core, the PMOBE asserts that SPP confers risk for binge eating by generating exposure to triggers of binge episodes, namely, interpersonal discrepancies, low interpersonal esteem, depressive affect, and dietary restraint. These four triggers are viewed as a sort of friction that persons with high levels of SPP generate as they go about their daily lives—a sort of friction that, over time, ignites episodes of binge eating. We refer to these four variables as *binge triggers* because evidence indicates that they precipitate binge eating (e.g., Heatherton & Baumeister, 1991).

Congruent with diathesis-stress models of perfectionism, the PMOBE regards SPP as a risk factor for psychopathology. However, the PMOBE also differs from diathesis-stress models, which assert that persons with high levels of perfectionism experience psychopathology only once they encounter specific situations, such as feeling physically unattractive (Joiner et al., 1997) or failing an exam (Hewitt & Flett, 1993). In contrast, the PMOBE understands persons high in SPP as actively shaping and generating situations, rather than merely responding to them (Chang, 2006b; Hewitt & Flett, 2002). The PMOBE thus views persons with high levels of SPP as active agents who, in their everyday lives, generate friction in the form of interpersonal discrepancies, low interpersonal esteem, depressive affect, and dietary restraint.

Interpersonal discrepancies. SPP and a distressing sense of disconnection from and disharmony with other people go hand and hand (Hewitt et al., 2006; Sherry, Lee-Baggley, Hewitt, & Flett, 2007). Interpersonal discrepancies (i.e., viewing oneself as falling short of other people's expectations), for example, are seen as especially common among and aversive to individuals with high levels of SPP (Hewitt & Flett, 2002). Theory and evidence also point toward interpersonal discrepancies as a form of social dysfunction associated with binge eating (Heatherton & Baumeister, 1991; Striegel-Moore, Silberstein, & Rodin, 1993).

Low interpersonal esteem. For persons high in SPP, establishing and maintaining a sense of worth and a positive self-view is a difficult task, as others' approval and caring are believed to be forthcoming only when perfect outcomes are obtained (Hewitt & Flett, 1991). Such beliefs, along with the extreme sensitivity to others' expectations typical of SPP (Flett et al., 1996), make interpersonal esteem (i.e., feelings of self-worth tied to the social domain) elusive. In the PMOBE, and in prior research (Steiger, Gauvin, Jabalpurwala, Seguin, & Stotland, 1999), low interpersonal esteem is also conceptualized as an aversive state conducive to binge eating.

Depressive affect. A tendency to think in a rigid and an extreme manner and to relate to other people in an acrimonious fashion makes depressive affect a frequent occurrence for persons high in SPP (Flett, Besser, & Hewitt, 2005; Powers, Koestner, & Topciu, 2005). Various studies also suggest that depressive affect (i.e., feeling sad, cheerless, miserable, and the like) is an antecedent of binge eating, with binge eating being understood as a way of reducing or regulating depressive affect (Greeno, Wing, & Shiffman, 2000; McManus & Waller, 1995).

Dietary restraint. In the PMOBE, dietary restraint is viewed as a precursor of binge eating that sets conditions conducive to binge eating. Sensitivity to social expectations for thinness, body dissatisfaction, and a tendency to pursue appearance ideals are believed to result in frequent—but unsuccessful—attempts at dietary restraint (i.e., behaviors aimed at reduced intake of calories) in persons high in SPP. Consistent with this view, research suggests that SPP is tied to unrealistic, hard-to-maintain dieting goals (Pliner & Haddock, 1996). As in prior work (Fairburn et al., 2003), the PMOBE asserts that extreme, but unsuccessful, attempts at dietary restraint predispose binge eating. Individuals may severely restrict their eating and then attempt to compensate for this caloric deprivation by binge eating (Herman & Polivy, 2004).

In viewing dietary restraint as a trigger of binge eating, the PMOBE is, ostensibly, at odds with evidence suggesting dieting reduces binge eating. Presnell and Stice (2003) and Stice, Presnell, Groesz, and Shaw (2005) found dietary restraint resulting in weight loss or in weight maintenance decreased binge eating—at least when dieting restraint was encouraged via a systematized, clinician-delivered program. Given their all-or-nothing cognitive style and their unrealistic goal setting (Hewitt & Flett, 2002), we believe persons high in SPP are unlikely to engage in the moderate form of dietary restraint recommended to, and presumably adopted by, patients in Stice's research. Rather than adopting a moderate caloric restriction strategy, the PMOBE asserts persons high in SPP are likely to engage in an extreme pattern of dietary restraint and, in doing so, to expose themselves to a greater likelihood of binge eating.

Binge eating in the PMOBE. In the PMOBE, binge eating is conceptualized as a maladaptive coping response to unpleasant contextual conditions engendered by SPP. The repetitive actions, sensory experience, and attentional narrowing accompanying binge eating may offer a way of temporarily avoiding the defective sense of self and the feelings of social disharmony brought on by SPP (Abramson et al., 2006; Heatherton & Baumeister, 1991). The PMOBE further asserts that binge eating functions as a short-lived means of alleviating hunger states (induced by dietary restraint) and escaping depressive affect. Such avoidant coping behavior is often seen in persons high in SPP (e.g., Dunkley et al., 2003). In summary, the PMOBE maintains that binge eating provides a way of momentarily avoiding or ameliorating unpleasant contextual conditions generated by SPP.

The PMOBE as an Integrative Model

Overall, then, the PMOBE may be seen as an integrative conceptual framework that provides a context for understanding both the personality structure that underlies binge eating and the contextual conditions that precipitate binge eating. The PMOBE thus synthesizes two previously disparate literatures: One suggesting that interpersonal discrepancies, low interpersonal esteem, depressive affect, and dietary restraint are products of SPP (e.g., Hewitt et al., 2006) and one suggesting these four variables are triggers of binge episodes (e.g., Greeno et al., 2000).

The PMOBE not only relates SPP to binge eating through binge triggers but also links binge triggers to one another. As seen in Figure 1, when depicted in structural form, the PMOBE may be understood as a dual-pathway model. In the first of these pathways, SPP leads to interpersonal discrepancies, interpersonal discrepancies lead to depressive affect, and depressive affect leads to binge eating. Whereas, in the second of these pathways, SPP leads to interpersonal esteem, interpersonal esteem leads to dietary restraint, and dietary restraint leads to binge eating.

Regarding the variables in the top half of Figure 1, the PMOBE holds that SPP generates interpersonal discrepancies, and such discrepancies prompt decrements in interpersonal esteem and feelings of depressive affect, which result in binge eating. This pathway is consistent with work suggesting that personality traits generate interpersonal complications and depressive affect that predispose binge eating (Hewitt et al., 2006; Moretti & Higgins, 1999). In terms of the variables in the bottom half of Figure 1, the PMOBE asserts that SPP lowers interpersonal esteem, and these esteem difficulties engender attempts at dietary restraint. Women with low interpersonal esteem may, for example, try to restrain their eating and to lose weight in order to gain more favorable evaluations from other people (Gilbert & Meyer, 2005). Dietary restraint is, in turn, believed to predispose episodes of binge eating in the PMOBE (Herman & Polivy, 2004).

Hypotheses Derived From the PMOBE

Central hypotheses. Persons high in SPP are proposed to generate binge triggers as they go about their daily lives, thereby increasing their likelihood of binge eating. Specifically, the PMOBE asserts that SPP is related to binge triggers, binge triggers are related to one another, and binge triggers are related to binge eating, as shown in Figure 1. The PMOBE further asserts that binge triggers mediate the SPP–binge eating link. Binge triggers are thus seen as instigating factors in binge episodes that help to explain how or why SPP contributes to binge eating.

Four additional mediational hypotheses are also postulated in the PMOBE. The PMOBE asserts that (a) interpersonal discrepancies mediate the relation between SPP and depressive affect; (b) interpersonal discrepancies and interpersonal esteem mediate the relation between SPP and dietary restraint; (c) interpersonal esteem, depressive affect, and dietary restraint mediate the connection between interpersonal discrepancies and binge eating; and, (d) dietary restraint mediates the link between interpersonal esteem and binge eating (see Figure 1).

Reciprocal relations. Cross-lagged analyses were also used to explore the possibility of reciprocal relations between binge triggers (on one day) and binge eating (on another day). These analyses are consistent with suggestions that researchers explore reciprocal relations between co-occurring variables, rather than

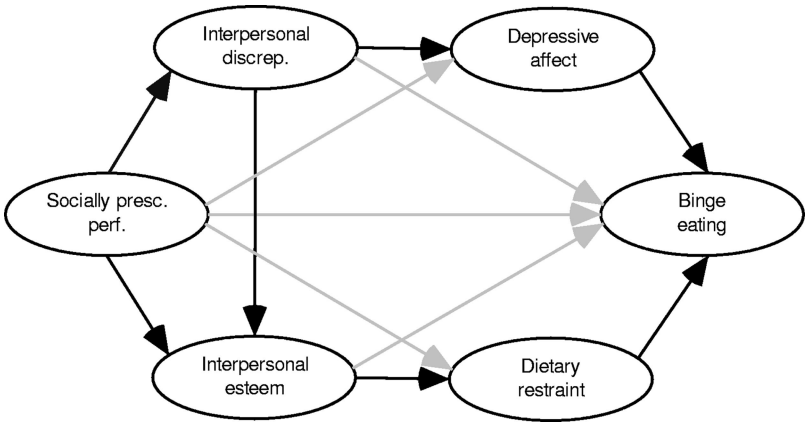

Figure 1. The structural model for the perfectionism model of binge eating (PMOBE). Ovals represent latent variables. Black arrows represent hypothesized direct effects; grey arrows represent paths hypothesized to be explained by indirect effects. In the interest of clarity, manifest variables are not shown. Socially presc. perf. = Socially prescribed perfectionism; Interpersonal discrep. = Interpersonal discrepancies.

foreclosing on the presence of only unidirectional relations between variables (Bandura, 1986; Cole & Maxwell, 2003). That is, although binge triggers are conceptualized as antecedents of binge eating in the PMOBE, supplementary analyses were also conducted to explore whether binge triggers and binge eating reciprocally influence one another. Such reciprocal relations are often discussed (McManus & Waller, 1995; Nolen-Hoeksema, Stice, Wade, & Bohon, 2007), but seldom tested, in the eating disorders literature, making these analyses a novel contribution to an understudied area. In particular, exploratory analyses of reciprocal relations between dietary restraint and binge eating are potentially informative, as the influence of these variables on one another is presently unclear (e.g., Presnell & Stice, 2003).

Incremental validity. Drawing on prior work (Dunkley, Sanislow, Grilo, & McGlashan, 2006), paths predicted in the PMOBE were expected to remain substantial and significant after controlling for SOP. This hypothesis is especially relevant to paths involving SPP. SPP and SOP overlap moderately (Hewitt & Flett, 1991), making it important to test whether SPP contributes to the PMOBE over and above SOP. Calls to return to an entirely self-oriented model of perfectionism (Shafran et al., 2002) also suggest a need to test whether there is a role for SPP beyond SOP.

Other authors (Enns, Cox, & Clara, 2005) emphasize the need to test whether lower order personality domains, such as SPP, provide unique information relative to higher order personality domains, such as neuroticism (i.e., a tendency to experience negative emotional states). Thus, we tested whether path coefficients in the PMOBE remained robust after controlling for neuroticism. Neuroticism is a suitable covariate, as it reliably predicts the variables of the PMOBE (e.g., Malouff, Thorsteinsson, & Schutte, 2005; Sherry, Hewitt, et al., 2007).

Generalizability. We tested whether factor loadings and path coefficients in the PMOBE generalized across Asian and European participants. Studies of eating disorders in diverse populations are scarce, and research is needed to establish whether models such as the PMOBE apply to ethnic minorities (Chang, Watkins, & Banks, 2004).

Widespread dissemination of Western beauty ideals (e.g., extreme slenderness) is thought to contribute to growing similarities among ethnicities with regard to disordered eating (Shaw, Ramirez, Trost, Randall, & Stice, 2004). Drawing on studies suggesting that Europeans and Asians in North America are similar in terms of risk factors for and patterns of eating pathology (e.g., Lee & Lock, 2007), factor loadings and path coefficients in the PMOBE were anticipated to generalize across Asian and European participants. For example, theory and evidence suggest that, in both cultures, familial and cultural pressures to be perfect bring about distress that contributes to binge eating (Striegel-Moore & Smolak, 2000).

Method

Participants and Procedure

Participants were recruited from participant pools in the department of psychology at the University of Saskatchewan (U of S), Saskatchewan, Canada and the University of British Columbia (UBC), Vancouver, British Columbia, Canada. Undergraduates responded to an advertisement inviting their participation in a study of personality. This advertisement indicated that participants would need access to a computer and the Internet each evening before going to bed. All participants received a 2.0% bonus added to their overall course grade. U of S students also received $5. Participation was voluntary and confidential, and the present study was approved by ethics boards at U of S and at UBC.

A total of 572 women taking psychology courses participated, with 6 women being excluded from the final sample. Of the final sample ($N = 566$), 178 (31.4%) women were from U of S, and 388 (68.6%) women were from UBC. Participants averaged 19.53 years of age ($SD = 2.60$) and 1.86 years of university education ($SD = 1.02$); 46.1% of students were in first-year university, 32.5% were in second year, 12.4% were in third year, and 9.0% were in fourth year or higher. Most participants (i.e., 93.6%) reported they were single. Participants also reported an average body mass index (BMI = kg/m^2) of 21.06 ($SD = 2.94$). A BMI of 18.5–24.9 is considered normal (Health Canada, 2003). Demographics pertaining to ethnicity, generational status, and time in Canada appear in Table 1 where it may be seen that Asian Canadians ($N = 257$) and European Canadians ($N = 257$) comprised 90.8% (514 of 566) of the final sample.

The present study involved two phases. During Phase 1, participants completed personality scales in a lab. In Phase 1, partici-

Table 1
Demographics Pertaining to Ethnicity, Generational Status, and Time in Canada

Variable	*M*	*SD*	*n*	%
Ethnicity				
Asian			257	45.4
European			257	45.4
Mixed			19	3.4
East Indian			16	2.8
Middle Eastern			7	1.2
Other			10	1.8
Generational status for all participants				
First generation			219	38.7
Second generation			135	23.9
Third generation			212	37.4
Generational status for Asian Canadians				
First generation			180	70.0
Second generation			77	30.0
Third generation			0	0.0
Generational status for European Canadians				
First generation			17	6.6
Second generation			34	13.2
Third generation			206	80.2
Time in Canada				
All participants	14.73	7.11		
Asian participants	10.82	6.68		
European participants	18.67	4.99		

Note. First generation = first-generation Canadian (i.e., the participant was born outside of Canada); Second generation = second-generation Canadian (i.e., the participant was born in Canada and had at least one parent born outside of Canada); Third generation = third-generation Canadian (i.e., the participant and both parents were born in Canada, or the participant, both parents, and prior generations were born in Canada; Statistics Canada, 2002); Time in Canada = number of years spent living in Canada.

pants also received instruction as to proper diary completion. The next day, Phase 2 began, and participants completed an 88-question, Internet-based, structured daily diary once a day for 7 consecutive days.

All 572 women completed Phase 1, and 6 women were excluded from Phase 2. Two women were dropped after reporting situations affecting their eating behaviors during Phase 2 (i.e., dental surgery and pregnancy). Two women were also excluded as they provided all seven daily reports in a single day. Two other women were dropped after failing to provide sufficient Phase 2 data (i.e., at least one complete daily report). The final sample thus included 566 women, meaning that 99.0% (566 of 572) of women who completed Phase 1 also completed Phase 2.

The 566 women in the present study provided 3,901 daily diaries. Participants were asked to complete their diaries just before going to bed. To encourage responses, each day participants received a personalized reminder via e-mail to complete their diary. Daily reports were date- and time stamped by an Internet server to verify timely reporting. Daily reports provided between 7 p.m. and 4 a.m. were retained for analyses, and 10.0% (392 of 3901) of reports were omitted as they did not fall within this time frame. Thus, 3,509 diary responses were included in the final sample, meaning 90.0% (3,509 of 3,901) of all possible daily reports were returned in a timely manner. In the final sample, the number of daily reports provided ranged from 1 to 7, with 0.9% (5 of 566) of participants providing only one report. On average, 6.20 (of a possible 7) daily reports were returned ($SD = 1.14$). Most daily reports were completed roughly 24 hr apart. For example, 68.0% of daily reports were completed within 1 hr of the previous day's submission, 86.6% of daily reports were completed within 2 hr of the previous day's submission, and 94.4% of daily reports were completed within 3 hr of the previous day's submission. Response rates were high across all diary days, with rates ranging from a high of 94.5% (535 of 566) on Day 1 to a low of 85.7% (485 of 566) on Day 5.

Phase 1 Measures

In Phase 1, constructs were assessed using three indicators, except for neuroticism (one indicator) and SOP (one indicator). For all scales, higher scores signify higher levels of the construct measured. The scales completed during Phase 1 are discussed below.

SPP. SPP was measured using the SPP subscale (15 items; e.g., "People expect nothing less than perfection from me") from Hewitt and Flett's (1991) Multidimensional Perfectionism Scale (HFMPS), the revised SPP subscale (three items; e.g., "My parents expect excellence of me") from Garner et al.'s (1983) Eating Disorder Inventory Perfectionism Scale (EDIP), and the revised Parental Perceptions subscale (five items; e.g., "Others punish me for doing things less than perfect") from Cox, Enns, and Clara's (2002) version of Frost et al.'s (1990) Multidimensional Perfectionism Scale (FMPS). One parental perceptions item was eliminated from the FMPS as it appears in the EDIP-SPP. EDIP-SPP and parental perceptions items were also modified to be more consistent with Hewitt and Flett's (1991) model of perfectionism. For instance, the EDIP-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." The FMPS Parental Perceptions subscale was similarly modified. 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 these revisions, the Parental Perceptions subscale was renamed the Interpersonal Perceptions subscale. Modifying the EDIP-SPP and the FMPS in this way enabled us to assess SPP apart from childhood history, to reduce recall bias, and to measure a broader range of interpersonal content. Research supports the reliability and the validity of the HFMPS-SPP, the revised EDIP-SPP, and the Interpersonal Perceptions subscale (Hewitt & Flett, 2004; Sherry, Hall, Hewitt, Flett, & Besser, 2007). For example, evidence indicates these scales are related to social problems, including hostile-dominant traits (Hill, Zrull, & Turlington, 1997), social stressors (Hewitt & Flett, 1993), and fewer positive relations with others (Chang, 2006b).

SOP. SOP was assessed via the SOP subscale (15 items; e.g., "One of my goals is to be perfect in everything I do") from the HFMPS. Evidence supports both the reliability and the validity of the HFMPS-SOP in university samples (e.g., Hewitt & Flett, 2004).

Neuroticism. Neuroticism was measured using the Neuroticism subscale (eight items; e.g., "I see myself as someone who gets nervous easily") from Benet-Martinez and John's (1998) Big Five Inventory (BFI-N). Evidence suggests that the BFI-N has good reliability and validity in undergraduate samples (John & Srivastava, 1999).

Phase 2 Measures

During Phase 2, constructs were measured via three indicators, except for interpersonal discrepancies (two indicators) and interpersonal esteem (two indicators). Consistent with past diary studies (e.g., Bolger, Zuckerman, & Kessler, 2000), in Phase 2, a 24-hr time frame was specified for scales. As is customary in diary research (e.g., Crocker, Karpinski, Quinn, & Chase, 2003), scales were slightly altered to suit the 24-hr time frame. For example, the Dietary Intent Scale (Stice, 1998b) item "I sometimes avoid eating in an attempt to control my weight" was revised to "During the past 24 hours, I sometimes avoided eating in an attempt to control my weight." Certain scales (noted below) were also shortened in a manner similar to past diary studies (Bolger & Zuckerman, 1995). For instance, the 12-item Discrepancy subscale of Slaney, Rice, Mobley, Trippi, and Ashby's (2001) Almost Perfect Scale-Revised (APS-R) was considered too long for Phase 2. Instead, the four highest loaded items from Slaney et al.'s (2001) factor analysis of the APS-R were used. This strategy was used for all revised scales in Phase 2 (unless otherwise noted). The measures completed in Phase 2 are outlined below.

Interpersonal discrepancies. The Interpersonal Discrepancies subscale (five items; e.g., "Did your behaviors fall short of other people's expectations?") of Flett and Hewitt's (2007) Multidimensional Discrepancy Inventory (MDI) measured interpersonal discrepancies. A modified version of Slaney et al.'s (2001) APS-R was also used to assess interpersonal discrepancies. For each APS-R intrapersonal discrepancies item (e.g., "My performance did not measure up to my standards"), a corresponding interpersonal discrepancies item was generated (e.g., "My performance did not measure up to others' standards"), resulting in a four-item APS-R Interpersonal Discrepancies subscale. Research supports

the reliability and the validity of the interpersonal subscales of the MDI and the APS-R in university samples (Flett & Hewitt, 2007; Sherry & Hall, 2006). In Sherry and Hall (2006), the original and revised MDI interpersonal discrepancies subscales were correlated at .73 ($p < .001$).[2]

Interpersonal esteem. A four-item short form of the Social Self-Esteem subscale of Janis and Field's (1959) Feelings of Inadequacy Scale (JFFIS; e.g., "I worried about how well I got along with other people") and a four-item short form of the Social Self-Esteem subscale of Heatherton and Polivy's (1991) State Self-Esteem Scale (SSES; e.g., "I was worried about what other people thought of me") assessed interpersonal esteem. Research suggests the JFFIS and the SSES are reliable and valid in undergraduates (e.g., Heatherton & Polivy, 1991). Sherry and Hall (2006) also found a strong link between the Social Self-Esteem subscale of the revised JFFIS ($r = .65$, $p < .001$). Sherry and Hall also observed a strong relation between the Social Self-Esteem subscale of the original SSES and the Social Self-Esteem subscale of the revised SSES ($r = .77$, $p < .001$).

Depressive affect. Depressive affect was assessed using a four-item short form of the Depression subscale (e.g., "sad") from McNair, Lorr, and Droppleman's (1992) Profile of Mood States (POMS-D). Four-item short forms of Form G (DACL-G; e.g., "depressed") and Form E (DACL-E; e.g., "downcast") of Lubin's (1965) Depression Adjective Checklist were also used to measure depressive affect. Research supports the reliability and the validity of all three scales in samples of university students (e.g., Lubin & Van Whitlock, 1996).

Dietary restraint. Only specific, concrete "behaviors. . .use[d] to reduce caloric intake" (Stice, Fisher, & Lowe, 2004, p. 57; e.g., "I skipped a meal in an effort to control my weight") measured dietary restraint in the present study (Stice et al., 2004). Dietary restraint was measured with a four-item short form of van Strien, Frijters, Bergers, and Defares' (1986) Dutch Restrained Eating Scale (DRES; e.g., "I refused food or drink offered because I was concerned about my weight"), the three-item Abstaining from Eating subscale of Stice's (1998b) Dietary Intent Scale (DIS; e.g., "I ate only one or two meals to try to limit my weight"), and a four-item short form of the Restraint subscale of Stunkard and Messick's (1985) Three-Factor Eating Questionnaire (TFEQ-R; e.g., "I deliberately took small helpings as a means of controlling my weight"). Studies indicate that these three scales are reliable and valid in samples of university students (e.g., Stice, 1998a). Sherry and Hall (2006) also found a strong relation between the original and the revised DRES ($r = .80$, $p < .001$), the original and the revised DIS Abstaining from Eating subscales ($r = .95$, $p < .001$), and the original and the revised TFEQ-R Restraint subscales ($r = .65$, $p < .001$).

Binge eating. In several models and measures of binge eating, negative affect (e.g., guilt) and binge eating are confounded (Garner et al., 1983; Stunkard & Messick, 1985). In the present study, however, we focused on behavioral features of binge eating (e.g., quickly consuming a large quantity of food). As operationalized in the present study, binge eating behavior (which we refer to as simply *binge eating*) excludes emotional eating (e.g., eating when anxious but without a sense of loss of control), compensatory behavior (e.g., purging), and postbinge emotionality (e.g., guilt after overeating). Distinguishing binge eating from negative affect allowed us to examine whether SPP predicts binge eating apart from negative affect. This is important because SPP moderately overlaps with negative affect (e.g., Downey & Chang, 2007; Dunkley et al., 2003).

In addition, measures of binge eating-defined words or phrases such as *bingeing* or *binge eat* for participants. Congruent with the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition, text revision's (*DSM–IV–TR*; American Psychiatric Association, 2000) definition of binge eating, participants were instructed that "'eating binge,' 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." The Binge Eating subscale from Thelen, Farmer, Wonderlich, and Smith's (1991) Bulimia Test-Revised (BULIT-R; e.g., "I ate a lot of food when I wasn't even hungry") was created by Lowe, Gleaves, and Murphy-Eberenz (1998) and used in the present study to assess binge eating. Three BULIT-R items were dropped: One was not adaptable to a 24-hr time frame, one was redundant with another BULIT-R item, and one was confounded with dietary restraint. This resulted in a nine-item BULIT-R subscale. A four-item version of Garner et al.'s (1983) Eating Disorder Inventory Bulimia Scale (EDIB; e.g., "I stuffed myself with food"), measuring only binge eating, was also used. Lastly, a seven-item version of the Binge Eating subscale from Stice, Telch, and Rizvi's (2000) Eating Disorder Diagnostic Scale (EDDS; e.g., "There were times when I ate much more rapidly than normal"), assessing only binge eating, was used. Studies support the reliability and the validity of these three scales in student samples (e.g., Bardone-Cone, 2007). Sherry and Hall (2006) also found a strong link between the Binge Eating subscale of the original BULIT-R and the Binge Eating subscale of the revised BULIT-R ($r = .75$, $p < .001$), the original and revised EDIB ($r = .66$, $p < .001$), and the Binge Eating subscale of the original EDDS and the Binge Eating subscale of the revised EDDS ($r = .64$, $p < .001$).

Data Analytic Strategy

Structural equation modeling (SEM) was used to compute latent correlations and to evaluate the measurement and the structural model for the PMOBE. Mediational hypotheses in the structural model were tested using bootstrap analyses. Cross-lagged analyses also explored the possibility of reciprocal relations between binge triggers and binge eating. In addition, the incremental validity of the PMOBE was tested. These analyses evaluated whether the variables of the PMOBE were related to binge eating and to one another above and beyond SOP or neuroticism. Finally, it was

[2] A cross-sectional study was conducted to examine the link between the original scales (e.g., the MDI) and revised daily scales (e.g., the MDI revised to suit a 24-hr period). All scales from Phase 2 were included in this study, except for the three scales assessing depressive affect. These three scales were excluded as they did not need to be modified for use in Phase 2. This study involved 112 undergraduates recruited from a first-year psychology course at U of S. Participants averaged 22.38 years of age ($SD = 6.65$) and 1.60 years of university education ($SD = 1.04$). Results from this study are referenced as Sherry and Hall (2006).

examined whether the PMOBE generalized across Asian and European participants.[3]

Results

Descriptive Statistics

In Table 2, means and standard deviations for manifest variables are shown. Means were considered relative to published values from similar samples, and means for the HFMPS (Hewitt & Flett, 2004), EDIP (Sherry et al., 2004), FMPS (Sherry, Hall, et al., 2007), and BFI-N (Benet-Martínez & John, 1998) fell within one standard deviation of values from past studies. When daily measures were aggregated across 7 days, means for daily variables were also within one standard deviation of values from prior research (Sherry & Hall, 2006).

Table 2
Means and Standards Deviations for Manifest Variables

	M	*SD*
Manifest variables from Phase 1		
SPP		
HFMPS-SPP	52.94	12.78
EDIP-SPP	12.66	2.79
FMPS interpersonal perceptions	9.05	3.44
SOP		
HFMPS-SOP	72.66	13.81
Neuroticism		
BFI-N	25.38	5.98
Manifest variables from Phase 2		
Interpersonal discrep.		
MDI interpersonal discrep.	7.75	2.36
APS-R interpersonal discrep.	11.64	4.25
Interpersonal esteem		
JFFIS social self-esteem	18.46	5.27
SSES social self-esteem	14.61	3.47
Depressive affect		
POMS-D depressive affect	2.53	2.63
DACL-G depressive affect	2.05	2.58
DACL-E depressive affect	2.05	2.58
Dietary restraint		
DRES dietary restraint	10.57	4.53
DIS abstaining from eating	5.55	2.58
TFEQ-R dietary restraint	9.84	5.51
Binge eating		
BULIT-R binge eating	15.46	5.28
EDIB binge eating	7.90	4.13
EDDS binge eating	14.16	7.22

Note. Means and standard deviations are based on 566 study participants; diary responses (N = 3,509) were aggregated across 7 days. SPP = socially prescribed perfectionism; HFMPS = Hewitt and Flett's (1991) Multidimensional Perfectionism Scale; EDIP = Eating Disorder Inventory Perfectionism Scale; SOP = self-oriented perfectionism; BFI-N = Big Five Inventory-Neuroticism; Interpersonal discrep. = interpersonal discrepancies; MDI = Multidimensional Discrepancy Inventory; APS-R = Almost Perfect Scale-Revised; JFFIS = Janis and Field's (1959) Feelings of Inadequacy Scale; SSES = State Self-Esteem Scale; POMS-D = Profile of Mood States-Depression subscale; DACL-G = Depression Adjective Checklist-Form G; DACL-E = Depression Adjective Checklist-Form E; DRES = Dutch Restrained Eating Scale; DIS = Dietary Intent Scale; TFEQ-R = Three-Factor Eating Questionnaire-Restraint subscale; BULIT-R = Bulimia Test-Revised; EDIB = Eating Disorder Inventory Bulimia Scale; EDDS = Eating Disorder Diagnostic Scale.

Variance Partitioning, Between-Persons and Within-Person Reliabilities, and Cronbach's Alpha

We used generalizability theory (Cranford et al., 2006; Shavelson, Webb, & Rowley, 1989) to decompose the variance of, and to compute the reliabilities for, the daily variables of the PMOBE (i.e., interpersonal discrepancies, interpersonal esteem, depressive affect, dietary restraint, and binge eating). Using an analysis of variance framework and the VARCOMP procedure in SPSS 15.0, the variance of each daily variable was decomposed into person, day, and item variability as well as variability arising from interactions between person, day, and item. We treated person, day, and item variability as random factors in these analyses.

Two components accounted for most of the variance, namely, person variability and person-by-day variability (see Table 3). The large proportion of variance attributable to person suggests there are traitlike, between-persons differences across all days and across all items in the present study. And the large proportion of variance attributable to person by day indicates there are between-persons differences on different days of the present study across all items.

Between-persons reliabilities (see equation 4 in Cranford et al., 2006) were calculated on the basis of 7 days of data collection. Between-persons reliabilities were high (i.e., $>$ .99) for all Phase 2 measures. These results suggest that, when daily variables were averaged across the 7 days of the present study, Phase 2 measures reliably assessed between-persons differences in interpersonal discrepancies, interpersonal esteem, depressive affect, dietary restraint, and binge eating. Within-person reliabilities (see equation 5 in Cranford et al., 2006) were also high (i.e., $>$ .99) for each of these five variables. These results indicate that Phase 2 measures reliably assessed within-person change in daily variables over the 7 days of the present study. Finally, as in previous research (e.g., Sherry, Hall, et al., 2007; Sherry, Hewitt, Flett, & Harvey, 2003; Srivastava, John, Gosling, & Potter, 2003), Cronbach's alpha was acceptable for all Phase 1 measures: SPP (.89), SOP (.89), and neuroticism (.79).

Bivariate Correlations

Manifest indicators of latent variables were standardized and summed prior to analyses; for example, the HFMPS-SPP, EDIP-SPP, and FMPS interpersonal perceptions subscales were standardized and summed to create the SPP variable seen in Table 4 (below the diagonal). As expected, (a) SPP correlated with binge triggers and binge eating, (b) binge triggers correlated with binge eating, and (c) binge triggers correlated with one another (see

[3] Ethnicity (e.g., being Asian Canadian) and data collection site (e.g., attending UBC) overlapped: 4.7% (12 of 257) of Asian Canadians were from U of S, and 95.3% (245 of 257) of Asian Canadians were from UBC; however, 60.7% (156 of 257) of European Canadians were from U of S and 39.3% (101 of 257) of European Canadians were from UBC. A decision was made to focus on the generalizability of the PMOBE across ethnic groups rather than the generalizability of the PMOBE across data collection sites. Given recent calls for further study of perfectionism and disordered eating in ethnic groups (e.g., Shaw et al., 2004), we believe that our focus on ethnicity is appropriate and of interest to researchers and to practitioners in this area.

Table 3
Variance Components for the Daily Variables of the PMOBE

Source of variance	Interpersonal discrep. (9 items)	Percentage of overall variance	Interpersonal esteem (8 items)	Percentage of overall variance	Depressive affect (12 items)	Percentage of overall variance	Dietary restraint (11 items)	Percentage of overall variance	Binge eating (20 items)	Percentage of overall variance
Person	39.50	48.5	66.43	63.7	44.96	54.0	159.36	71.4	283.6	64.1
Day	0.00	0.0	5.71	5.5	0.00	0.0	1.98	0.9	1.88	0.4
Item	4.89	6.0	2.89	2.8	6.97	8.4	7.14	3.2	4.59	1.0
Person by day	34.13	41.9	27.39	26.3	28.66	34.4	49.57	22.2	151.48	34.2
Person by item	2.48	3.0	1.19	1.1	2.25	2.7	4.14	1.9	1.02	0.2
Day by item	0.00	0.0	0.28	0.3	0.16	0.2	0.49	0.2	0.00	0.0
Error	0.50	0.6	0.38	0.3	0.29	0.3	0.46	0.2	0.31	0.1
Total	81.50	100.0	104.27	100.0	83.29	100.0	223.14	100.0	442.88	100.0

Note. Estimates of variance components are based on 566 study participants and 3,509 diary responses provided over 7 days. PMOBE = perfectionism model of binge eating; Interpersonal discrep. = Interpersonal discrepancies; Person = variance due to between-persons differences across all days and across all items; Day = variance due to daily differences across all persons and across all items; Item = variance due to responses to scale items across all persons and across all days; Person by day = variance due to between-persons differences on different days across all items; Person by item = variance due to between-persons differences in responses to scale items across all days; Day by item = variance due to daily differences in responses to scale items across all persons; Error = systematic error (i.e., the Person × Day × Item interaction) plus random error (i.e., unknown sources of variance; Cranford et al., 2006). Small (i.e., near zero) negative variances were observed in our estimates of variance components. Small negative variances are not uncommon and are usually attributed to sampling error (Brennan, 2001). Because negative variances are not theoretically possible, we followed recommendations to set negative variances to zero (Brennan, 2001).

Table 4 below the diagonal). SOP correlated with SPP, several binge triggers, and binge eating. Neuroticism also correlated with SPP, SOP, binge triggers, and binge eating. Such results suggest SOP and neuroticism are suitable covariates. Several variables in the PMOBE also correlated with demographics (i.e., age, data collection site, time in Canada, ethnicity, generational status, and BMI). Demographics were thus taken into account in analyses.

SEM

SEM offers advantages as a data analytic strategy, including the ability to specify and to compare alternative models and the ability to estimate measurement error (e.g., Byrne, 2001). We conducted SEM analyses with AMOS 7.0 software using maximum-likelihood estimation (Arbuckle, 2006). In testing the measurement and the structural model for the PMOBE, we aggregated Phase 2 variables across seven points in time (i.e., across 7 days of reported data), and we examined measurement models before structural models were tested (Byrne, 2001).

We assessed model fit with multiple indicators, including the chi-square/*df* ratio (χ^2/df), 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%

Table 4
Bivariate and Latent Correlations

Manifest variable	1	2	3	4	5	6	7	8
1. SPP	—	.44**	.42**	.57**	−.53**	.39**	.24**	.31**
2. SOP	.35**	—	.21**	.12*	−.21**	.11	.18**	.13*
3. Neuroticism	.34**	.21**	—	.40**	−.42**	.43**	.17**	.21**
4. Interpersonal discrep.	.46**	.12*	.37**	—	−.72**	.68**	.39**	.46**
5. Interpersonal esteem	−.42**	−.19**	−.41**	−.63**	—	−.57**	−.43**	−.41**
6. Depressive affect	.33**	.11	.43**	.63**	−.51**	—	.24**	.36**
7. Dietary restraint	.20**	.17**	.17**	.36**	−.39**	.24**	—	.47**
8. Binge eating	.25**	.12*	.20**	.42**	−.37**	.35**	.46**	—
9. Age	−.09	.02	−.06	−.05	.17**	−.03	−.04	−.08
10. Site	−.08	.05	−.10	−.11	.14**	−.07	−.06	−.09
11. Time in Canada	−.06	.11*	−.10	−.21**	.24**	−.12*	−.17**	−.17**
12. Ethnicity	.26**	−.13*	.14*	.27**	.28**	.14**	.02	.11
13. Generational status	−.13**	.13*	−.09	−.21**	.21**	−.12*	−.06	−.08
14. BMI	.00	−.05	−.03	.01	.09	.12*	−.04	.04

Note. Bivariate correlations appear below the diagonal; latent correlations appear above the diagonal. Bivariate and latent correlations are based on 566 study participants; diary responses (N = 3,509) were aggregated across 7 days. SPP = socially prescribed perfectionism; SOP = self-oriented perfectionism; Interpersonal discrep. = Interpersonal discrepancies; Site = data collection site; Time in Canada = number of years spent living in Canada. Site was coded so that University of Saskatchewan = 1 and University of British Columbia = 0; Ethnicity was coded so that Asian = 1 and European = 0; Generational status was coded so that first generation = 0, second generation = 1, and third generation = 2. A bivariate correlation in the range of .10 signifies a small effect size; a bivariate correlation in the range of .30 signifies a medium effect size; a bivariate correlation in the range of .50 signifies a large effect size (Cohen, 1992).
* $p < .01$. ** $p < .001$.

CI). A χ^2/df in the range of 2 and an RMSEA in the range of .05–.08 suggest adequate fit. For the CFI and the IFI, a value in the range of .95 suggests a well-fitting model (Kline, 2005). In making model comparisons, the Bayes information criterion (BIC) and the Akaike information criterion (AIC) were considered. Smaller BIC and AIC values suggest better fit and greater parsimony (Kline, 2005).

The Measurement Model for the PMOBE

We used confirmatory factor analysis (CFA) to examine the association between latent variables and their constituent manifest variables (Byrne, 2001). Specifically, we used CFA to test whether the measurement model for the PMOBE represented a valid construct. As expected, the measurement model for the PMOBE was well supported and evidenced acceptable fit indices, $\chi^2(89, N = 566) = 219.43$, $p < .001$; $\chi^2/df = 2.47$; CFI = .99; IFI = .99; RMSEA = .05 (90% CI: .04, .06). Standardized factor loadings for the manifest indicators of the latent variables of the PMOBE were also substantial and significant ($p < .001$). Specifically, these factor loadings ranged from a low of .62 for the EDIP-SPP to a high of .99 for the DACL-G. Overall, then, CFA suggested that the measurement model for the PMOBE was psychometrically sound.

Discriminant validity analyses. The degree of overlap between (a) SPP and interpersonal discrepancies and (b) interpersonal discrepancies and interpersonal esteem could be an issue. Therefore, we conducted discriminant validity analyses (Kline, 2005). The measurement model for the PMOBE (i.e., Model 1) was compared with a version of the measurement model for the PMOBE in which the latent correlation between SPP and interpersonal discrepancies was fixed to 1.0 (i.e., Model 2). In Model 2, SPP and interpersonal discrepancies were thus treated as identical. BIC and AIC values suggested that Model 1 (BIC = 517.35; AIC = 313.43) represented the data better than Model 2 (BIC = 569.04; AIC = 369.47). Similarly, the measurement model for the PMOBE (i.e., Model 1) was contrasted with a version of the measurement model for the PMOBE in which the latent correlation between interpersonal discrepancies and interpersonal esteem was constrained to 1.0 (i.e., Model 3). Interpersonal discrepancies and interpersonal esteem were therefore treated as identical in Model 3. BIC and AIC values indicated that Model 1 fit the data better than Model 3 (BIC = 887.81; AIC = 688.24). In summary, model fit was eroded when either SPP and interpersonal discrepancies or interpersonal discrepancies and interpersonal esteem were treated as identical. Discriminant validity analyses thus suggest (a) SPP and interpersonal discrepancies and (b) interpersonal discrepancies and interpersonal esteem are related, but distinct, constructs.[4]

Generalizability. A multigroup CFA tested whether factor loadings for the measurement model varied across ethnicities (Byrne, 2001). A baseline model was estimated for Asians, $\chi^2(89, N = 257) = 147.81$, $p < .001$, $\chi^2/df = 1.66$, CFI = .99, IFI = .99, RMSEA = .05 (90% CI: .04, .07); and for Europeans, $\chi^2(89, N = 257) = 164.48$, $p < .001$, $\chi^2/df = 1.85$, CFI = .98, IFI = .98, RMSEA = .06 (90% CI: .04, .07). For both groups, the measurement model was thus well supported.

We next used a series of chi-square difference tests to evaluate the invariance of factor loadings across ethnicities. We found one difference with these tests: The factor loading for the APS-R was higher in Europeans (.91) than in Asians (.83), $\Delta\chi^2(3, N = 566) = 17.41$, $p < .001$. No other significant chi-square difference tests were found, indicating a pattern of partial measurement invariance. This partially invariant measurement model fit the data well, $\chi^2(187, N = 566) = 331.87$, $p < .001$, $\chi^2/df = 1.78$, CFI = .98, IFI = .98, RMSEA = .04 (90% CI: .03, .05). Results from this multigroup CFA are consistent with Byrne, Shavelson, and Muthén's (1989) assertion that total measurement invariance is seldom found and suggests one manifest variable in the PMOBE was a stronger indicator of its latent construct in one ethnic group compared with another.

To summarize, as hypothesised, the measurement model for the PMOBE was identified as a well-fitting model that was suitable for testing in structural form. Factor loadings for this measurement model were also largely, but not entirely, invariant across ethnic groups.

Latent Correlations

Before the structural model for the PMOBE was evaluated, we computed latent correlations, correcting for measurement error (see Table 4 above the diagonal). Latent correlations closely resembled bivariate correlations involving observed variables and thus are not discussed in detail. Latent correlations were also generally larger in magnitude than bivariate correlations. The pattern of intercorrelation displayed in Table 4 (above the diagonal) suggests merit in testing the structural model for, and the mediational aspect of, the PMOBE.

The Structural Model for the PMOBE

Model testing. In testing the structural model, factor loadings were freely estimated. Fit indices suggested this model was well supported, $\chi^2(92, N = 566) = 233.98$, $p < .001$, $\chi^2/df = 2.54$, CFI = .98, IFI = .98, RMSEA = .05 (90% CI: .04, .06), BIC = 512.88, AIC = 321.98. As expected, the following path coefficients were nonsignificant: SPP to binge eating, SPP to depressive affect, SPP to dietary restraint, and interpersonal esteem to binge eating (see Figure 2). Somewhat unexpectedly, the path between interpersonal discrepancies and binge eating was significant. All remaining paths were substantial and significant and consistent with the hypothesized structural model for the PMOBE (with one exception). That is to say, (a) SPP was linked to interpersonal discrepancies and interpersonal esteem, (b) interpersonal discrep-

[4] Two doctoral-level psychologists also independently rated the potential overlap of items measuring (a) SPP and interpersonal discrepancies and (b) interpersonal discrepancies and interpersonal esteem. An item from one construct (e.g., SPP) was designated as potentially overlapping with an item from another construct (e.g., interpersonal discrepancies) if both raters identified the item as potentially overlapping. No interpersonal discrepancies items were rated as potentially overlapping with interpersonal esteem items. However, five SPP items were rated as potentially overlapping with interpersonal discrepancies items: Three items were from the HFMPS-SPP (see items 5, 13, and 41 in Hewitt & Flett, 2004), and two items were from the Interpersonal Perceptions subscale (see items 22 and 35 in Frost et al., 1990). These five items were removed from the SPP scale, and we reran our central analyses (i.e., the measurement and the structural model for the PMOBE). The pattern, magnitude, and significance of our results were essentially unchanged when using a version of the SPP scale that excluded potentially overlapping items. These results are available from Simon B. Sherry upon request.

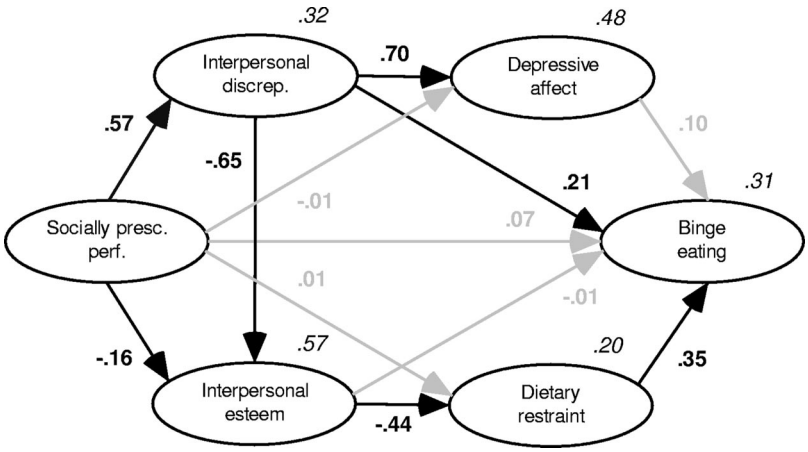

Figure 2. The structural model for the perfectionism model of binge eating (PMOBE). This model is based on 566 study participants; diary responses (N = 3,509) were aggregated across 7 days. Ovals represent latent variables. Black arrows represent significant paths (i.e., $p < .01$); grey arrows represent nonsignificant paths (i.e., $p > .01$). Standardized path coefficients appear in bold. Italicized numbers 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. Interpersonal discrep. = Interpersonal discrepancies; Socially presc. perf. = Socially prescribed perfectionism.

ancies were linked to interpersonal esteem and depressive affect, (c) interpersonal esteem was linked to dietary restraint, and (e) dietary restraint was linked to binge eating. However, the hypothesized link between depressive affect and binge eating failed to reach significance ($\beta = .10$, $p = .08$).

Mediational analyses. According to MacKinnon, Lockwood, Hoffman, West, and Sheets (2002), a significant indirect effect indicates mediation has occurred. We used bootstrap analyses to evaluate the significance levels of indirect effects (see Shrout & Bolger, 2002). We used random sampling with replacement to create 1,000 (n = 566) bootstrap samples from the original data set. We used bootstrap samples to estimate bias-corrected standard errors for indirect effects and 99% CIs for indirect effects. We calculated indirect effects by multiplying (a) path coefficients from predictor variables to mediator variables and (b) path coefficients from mediator variables to criterion variables. CIs were also placed around indirect effects. If zero is not included in the 99% CI for an indirect effect, then the indirect effect is significant at $p < .01$.

As seen in Table 5, four of five indirect effects were significant: (a) The indirect effect of SPP on binge eating through all four binge triggers was significant; (b) the indirect effect of SPP on depressive affect through interpersonal discrepancies was significant; (c) the indirect effect of SPP on dietary restraint through interpersonal discrepancies and interpersonal esteem was significant; and, (d) the indirect effect of interpersonal esteem on binge eating through dietary restraint was significant. However, the indirect effect of interpersonal discrepancies on binge eating through interpersonal esteem, depressive affect, and dietary restraint was not significant. Instead, the interpersonal discrepancies–binge eating path remained significant. Overall, then, five indirect effects were proposed and four were supported.[5]

Incremental validity. Consistent with our hypothesis that paths in the PMOBE would be virtually unchanged after controlling for SOP or neuroticism, path coefficients in the PMOBE (see Figure 2) remained substantial and significant when we included SOP or neuroticism as a covariate. And neither SOP ($\beta = .02$, $p > .05$) nor neuroticism was related to binge eating ($\beta = .00$, $p > .05$) when added to the structural model. The fit of the structural model was also eroded when we included SOP (BIC = 690.22; AIC = 468.95) or neuroticism (BIC = 582.75; AIC = 361.48). This suggests that SOP and neuroticism detract from the PMOBE.[6]

Generalizability. A multigroup analysis tested whether path coefficients in the structural model for the PMOBE varied across ethnic groups. Baseline models were estimated first, and the structural model for the PMOBE fit data well in Asians, $\chi^2(92, N = 257) = 149.95$, $p < .001$, $\chi^2/df = 1.63$, CFI = .99, IFI = .99,

[5] In conducting SEM analyses, a decision was made to focus on the PMOBE apart from demographics. Two factors influenced this decision: First, models with many parameters (e.g., multiple demographics) are hard to replicate (Byrne, 2001). Second, demographics were only minor contributors to the measurement and the structural model for the PMOBE. Thus, SEM analyses involving demographics are presented only in footnotes.

The structural model for the PMOBE continued to fit well after demographics were built into the model, $\chi^2(197, N = 566) = 501.55$, $p < .001$, $\chi^2/df = 2.55$, CFI = .97, IFI = .97, RMSEA = .05 (90% CI: .05, .06). Once demographics were included, all paths remained substantial and significant, and the proportion of variance explained was virtually the same (as seen in Figure 2).

[6] The incremental validity shown by the PMOBE is noteworthy. However, there is also a potential downside to using SOP or neuroticism as a control variable. SPP is moderately related to SOP and to neuroticism (e.g., Sherry, Hewitt et al., 2007). Removing variance shared with SOP or with neuroticism may thus result in a form of SPP that is unlikely to be observed in real life. As Coyne and Gottlieb (1996) asserted, using statistical controls, such as SOP or neuroticism, may create variables of questionable meaning. For these reasons, tables and figures do not show results for which SOP or neuroticism is included as a covariate.

RMSEA = .05 (90% CI: .04, .06); and in Europeans, $\chi^2(92, N = 257) = 185.47$, $p < .001$, $\chi^2/df = 2.02$, CFI = .98, IFI = .98, RMSEA = .06 (90% CI: .05, .08).

To test the invariance of path coefficients across ethnicities, a chi-square difference test compared a partially constrained version of the structural model for the PMOBE with an unconstrained version of the structural model for the PMOBE. We treated path coefficients and factor loadings as invariant in the partially constrained model, except for the factor loading for the APS-R, which was identified as noninvariant in the measurement model. A chi-square difference test suggested that the partially constrained model and the unconstrained model did not differ, $\Delta\chi^2(21, N = 566) = 37.05$, $p > .01$. This result suggests that path coefficients in the structural model for the PMOBE were invariant across ethnic groups (Byrne, 2001).[7]

In summary, the hypothesised structural model for the PMOBE was found to be a well-fitting model that showed (a) the expected pattern of indirect effects, (b) incremental validity beyond SOP or neuroticism, and (c) generalizability across Asian and European participants.[8]

Cross-Lagged Analyses

Cross-lagged analyses explored reciprocal relationships between binge triggers and binge eating over time (see Figures 3, 4, 5, and 6). We conducted these analyses using SEM and involved data from all 7 diary days. Missing data was handled by using full information maximum-likelihood (FIML) estimation (Arbuckle, 2006). FIML allows for use of all potential data in analyses and provides efficient estimates (Hox, 2002). As an invariant factor structure was expected, all factor loadings for like indicators of latent variables were constrained to equality over time (Cole & Maxwell, 2003). Autoregressive paths (e.g., the path between binge eating on Day 1 and binge eating on Day 2) assess interindividual stability, whereas cross-lagged paths assess whether a change in one variable (e.g., interpersonal discrepancies on Day 2) is associated with a change in another variable over time (e.g., binge eating on Day 3; Burkholder & Harlow, 2003). Both autoregressive and cross-lagged paths were also constrained to equality over time, as these paths were not expected to vary from one day to the next. In addition, corresponding error terms were correlated across time points, whereas disturbance terms were correlated within time points (Cole & Maxwell, 2003). Initial variables in cross-lagged analyses (e.g., interpersonal discrepancies on Day 1 and binge eating on Day 1) were correlated with one another and were left free to vary (Burkholder & Harlow, 2003). Initial variables in cross-lagged analyses differ from subsequent variables in cross-lagged analyses, as initial variables do not control for the previous day's variables. As cross-lagged paths involving initial variables fail to assess change over time, these paths are no longer mentioned.

Interpersonal discrepancies. Cross-lagged analyses involving interpersonal discrepancies and binge eating evidenced acceptable fit indices, with interpersonal discrepancies predicting significant changes in binge eating and vice versa (see Figure 3), $\chi^2(461, N = 566) = 1165.18$, $p < .001$, $\chi^2/df = 2.53$, CFI = .96, IFI = .96, RMSEA = .05 (90% CI: .05, .06).

Interpersonal esteem. We also found acceptable model fit for cross-lagged analyses involving interpersonal esteem and binge eating (see Figure 4), $\chi^2(461, N = 566) = 1041.65$, $p < .001$, $\chi^2/df = 2.26$, CFI = .97, IFI = .97, RMSEA = .05 (90% CI: .04, .05). In these analyses, interpersonal esteem significantly predicted changes in binge eating, but binge eating did not significantly predict changes in interpersonal esteem.

Depressive affect. For cross-lagged analyses involving depressive affect and binge eating, we observed acceptable model fit, with depressive affect and binge eating predicting significant changes in one another over time (see Figure 5), $\chi^2(705, N = 566) = 1692.62$, $p < .001$, $\chi^2/df = 2.40$, CFI = .97, IFI = .97, RMSEA = .05 (90% CI: .05, .05).

Dietary restraint. In the case of cross-lagged analyses involving dietary restraint and binge eating, we also found acceptable fit indices, with dietary restraint predicting significant changes in binge eating and vice versa (see Figure 6), $\chi^2(705, N = 566) = 1818.84$, $p < .001$, $\chi^2/df = 2.58$, CFI = .96, IFI = .96, RMSEA = .05 (90% CI: .05, .06).

Consistent with the PMOBE, cross-lagged analyses suggested that all four triggers of binge episodes significantly predicted changes in binge eating. We also observed reciprocal relations between binge triggers and binge eating, with binge eating predicting changes in interpersonal discrepancies, depressive affect, and dietary restraint (but not interpersonal esteem). In addition, cross-lagged paths involving binge triggers were consistently stronger than cross-lagged paths involving binge eating. All autoregressive paths were also substantial and significant, indicating a pattern of interindividual stability over the 7 days of the present study. Overall, cross-lagged analyses suggested significant temporal and reciprocal relations between binge triggers and binge eating, with binge triggers exerting a more consistent and a somewhat stronger influence on binge eating (than the other way around).

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[7] Following inquires from reviewers with respect to the possible influence of generational status on our findings, we restricted our sample to first-generation Asian Canadians ($N = 180$) and reran our central analyses (i.e., the measurement and the structural model for the PMOBE). The pattern of findings for first-generation Asian Canadians was virtually identical to the pattern of findings for our overall final sample ($N = 566$). These results are available from Simon B. Sherry upon request.

[8] The PMOBE is focused on questions about mediation as opposed to questions about moderation. However, consistent with research indicating that perfectionism interacts with variables such as self-esteem to predict disordered eating (Joiner et al., 1997), exploratory moderational analyses were conducted. Four moderated multiple regression analyses and four multilevel moderational analyses (Raudenbush, Bryk, & Congdon, 2007) tested whether SPP and binge triggers interact to predict binge eating. No support was found for these analyses. These results do not directly test, or argue against, other moderational models of perfectionism and disordered eating, which involve different variables and three-way interactions (Vohs et al., 1999). Instead, these results suggest that SPP and binge triggers did not interact to predict binge eating in our study.

Drawing on past research (e.g., Sherry et al., 2004), a reviewer suggested SPP and SOP may interact to predict binge eating. Neither moderated multiple regression analyses nor multilevel moderational analyses suggested that SPP interacted with SOP to predict binge eating. An SPP $\times$ SOP interaction term was also built into the structural model for the PMOBE. This model did not meet criteria for a reasonably well-fitting model, and all paths from the SPP $\times$ SOP interaction term to binge triggers and to binge eating were nonsignificant.

Table 5
Bootstrap Analyses of Indirect Effects: Testing Mediational Hypotheses in the Structural Model for the PMOBE

Hypothesized indirect effect	Unstandardized indirect effect[a] (*B*)	Standardized indirect effect (β)	Bootstrap estimates	
			SE for standardized indirect effect	99% confidence interval for standardized indirect effect (lower and upper)
SPP to binge eating	.37	.25	.04	.16, .36*
SPP to depressive affect	.38	.40	.05	.29, .54*
SPP to dietary restraint	.21	.23	.03	.15, .32*
Interpersonal discrep. to binge eating	.33	.17	.07	−.02, .36
Interpersonal esteem to binge eating	−.18	−.15	.03	−.24, −.09*

Note. Bootstrap analyses are based on 1,000 bootstrap samples (with each sample involving $n = 566$). PMOBE = perfectionism model of binge eating; SPP = socially prescribed perfectionism; *SE* = bias-corrected standard error; Interpersonal discrep. = Interpersonal discrepancies.
[a] Indirect effects are based on all possible indirect paths.
* $p < .01$ (for confidence intervals excluding zero).

Discussion

The PMOBE relates SPP to binge eating through four triggers of binge episodes (i.e., interpersonal discrepancies, interpersonal esteem, depressive affect, and dietary restraint). SEM analyses suggested the measurement model for the PMOBE is a well-fitting model composed of related, but distinct, constructs. The structural model for the PMOBE also fit the data well, and bootstrap tests of mediational hypotheses supported four of five proposed indirect effects, including our prediction that binge triggers help to explain why SPP is linked to binge eating. Cross-lagged analyses also showed reciprocal relations between certain binge triggers and binge eating. Finally, results supported the PMOBE's generalizability (across Asians and Europeans) and incremental validity (beyond SOP or neuroticism). These results are discussed below.

The Structural Model for the PMOBE

Triggers of binge episodes are often proposed but seldom integrated. In contrast, the structural model for the PMOBE integrated four binge triggers into a model organized around SPP, thus showing the potential of the PMOBE to bring greater coherence to researchers' understanding of the pathogenesis of binge eating. Various data analytic approaches (e.g., discriminant validity analyses) also suggested that, despite overlapping, the variables of the PMOBE are uniquely and differentially related to binge eating. As seen in Figure 2, SPP plays a key role in the PMOBE and may be seen as driving and coordinating the constellation of cognition, affect, and behavior in the model. Thus, unlike prior research wherein perfectionism is seen as one of several attributes possessed by binge eaters (e.g., Heatherton & Baumeister, 1991), in the PMOBE, SPP is conceptualized as an underlying personality risk factor for binge eating that offers a context for understanding why individuals binge eat (see also Abramson et al., 2006).

Consistent with Hewitt et al. (2006), who argued that SPP is associated with a sense of disconnection from the social world, SPP was related to higher interpersonal discrepancies and lower interpersonal esteem. Persons high in SPP appear to see others as chronically disappointed with them and disapproving of them. If, as Moretti and Higgins (1999) asserted, people often have an "inner audience" involving intrapsychic representations of others'

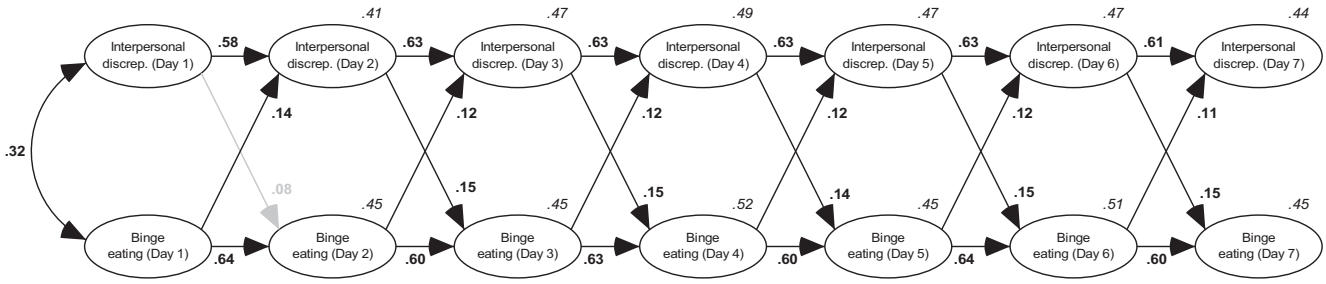

Figure 3. Cross-lagged analyses involving interpersonal discrepancies and binge eating. This model is based on 566 study participants and 3,509 diary responses provided over 7 days. Ovals represent latent variables. Black arrows represent significant paths (i.e., $p < .01$); grey arrows represent nonsignificant paths (i.e., $p > .01$). Double-headed arrows represent latent correlations between exogenous variables. Horizontal paths represent autoregressive paths; diagonal paths represent cross-lagged paths. Standardized path coefficients appear in bold. Italicized numbers appearing in the upper right hand of endogenous variables (e.g., interpersonal discrep. [Day 2]) represent the proportion of variance accounted for by associated exogenous variables. In the interest of clarity, manifest variables, error terms, and disturbance terms are not shown. Although unstandardized path coefficients are constrained to equality, standardized path coefficients may vary slightly. Interpersonal discrep. = Interpersonal discrepancies.

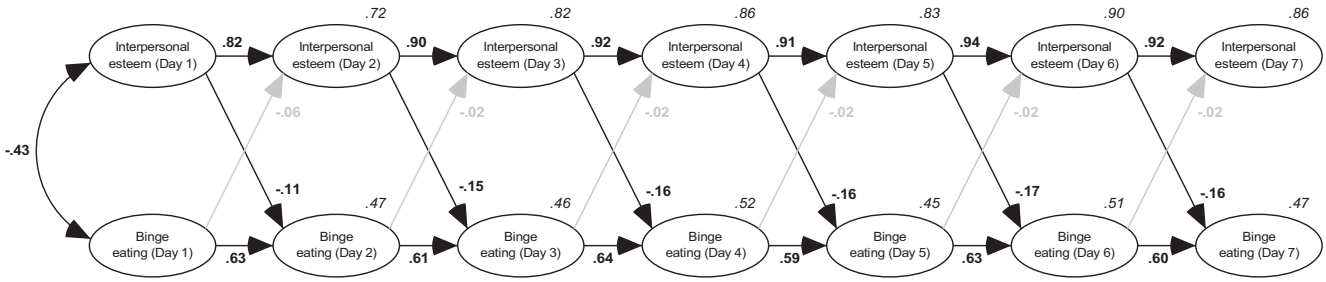

Figure 4. Cross-lagged analyses involving interpersonal esteem and binge eating. This model is based on 566 study participants and 3,509 diary responses provided over 7 days. Ovals represent latent variables. Black arrows represent significant paths (i.e., $p < .01$); grey arrows represent nonsignificant paths (i.e., $p > .01$). Double-headed arrows represent latent correlations between exogenous variables. Horizontal paths represent autoregressive paths; diagonal paths represent cross-lagged paths. Standardized path coefficients appear in bold. Italicized numbers appearing in the upper right hand of endogenous variables (e.g., interpersonal esteem [Day 2]) represent the proportion of variance accounted for by associated exogenous variables. In the interest of clarity, manifest variables, error terms, and disturbance terms are not shown. Although unstandardized path coefficients are constrained to equality, standardized path coefficients may vary slightly.

opinions and expectations, then persons high in SPP seem to experience their inner audience as hypercritical. A feeling that one is a person of value in the eyes of others may be hard to obtain, and even harder to maintain, when one believes others are harshly evaluating oneself vis-à-vis unrealistic standards.

The structural model for the PMOBE, and bootstrap tests of its hypothesized indirect effects, provided consistent (albeit imperfect) support for the PMOBE.

The indirect effect of SPP on binge eating through binge triggers was significant, thereby confirming the central mediational hypothesis in the structural model. Although a significant path between SPP and binge eating is absent in Figure 2, this does not imply an insubstantial relation between these variables. Instead, it suggests that the link between SPP and binge eating, which was established as substantial and significant before mediational analyses, was no longer significant once binge triggers were taken into account.

Three other indirect effects also emerged in the expected manner. The indirect effect of SPP on depressive affect through interpersonal discrepancies was significant, thereby supporting assertions that interpersonal discrepancies are central to the SPP–depressive affect link (Horney, 1950). Given their concern over and their sensitivity to others' evaluations, persons high in SPP may often perceive that they have fallen short of others' expectations, and this perceived inability to satisfy others may be depressogenic (Hewitt et al., 2006). Moreover, the indirect effect of SPP on dietary restraint through interpersonal discrepancies and interpersonal esteem was significant. Individuals high in SPP appear prone to feeling a sense of disharmony with and exclusion from others because they believe that they are falling short of others' expectations (Moretti & Higgins, 1999). Amid such social circumstances, women high in SPP may attempt to restrain their eating and to meet widely held, socially valued ideals of thinness in an effort to win others' approval or to avoid negative evaluation

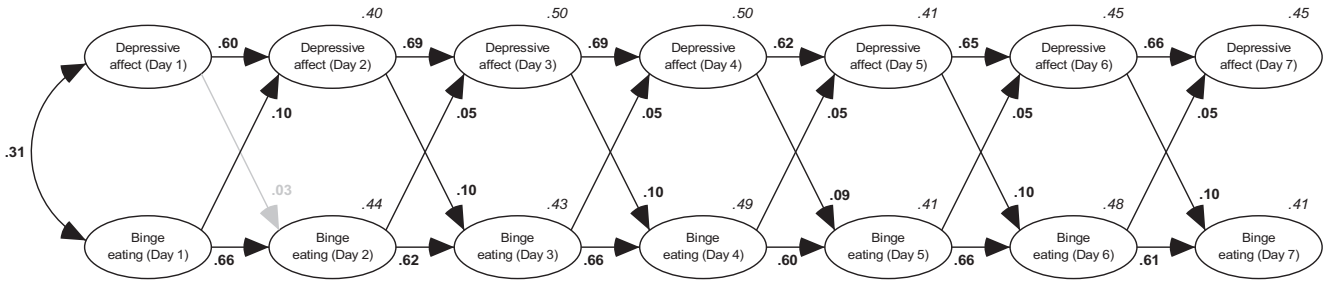

Figure 5. Cross-lagged analyses involving depressive affect and binge eating. This model is based on 566 study participants and 3,509 diary responses provided over 7 days. Ovals represent latent variables. Black arrows represent significant paths (i.e., $p < .01$); grey arrows represent nonsignificant paths (i.e., $p > .01$). Double-headed arrows represent latent correlations between exogenous variables. Horizontal paths represent autoregressive paths; diagonal paths represent cross-lagged paths. Standardized path coefficients appear in bold. Italicized numbers appearing in the upper right hand of endogenous variables (e.g., depressive affect [Day 2]) represent the proportion of variance accounted for by associated exogenous variables. In the interest of clarity, manifest variables, error terms, and disturbance terms are not shown. Although unstandardized path coefficients are constrained to equality, standardized path coefficients may vary slightly.

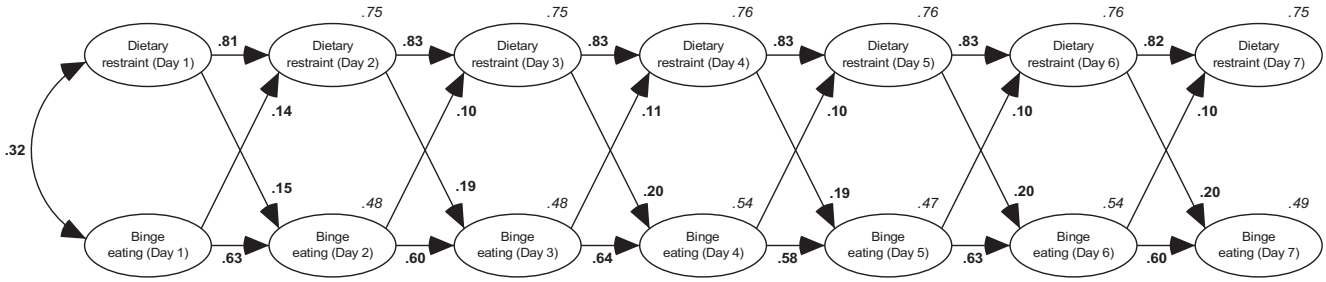

Figure 6. Cross-lagged analyses involving dietary restraint and binge eating. This model is based on 566 study participants and 3,509 diary responses provided over 7 days. Ovals represent latent variables. Black arrows represent significant paths (i.e., $p < .01$); grey arrows represent nonsignificant paths (i.e., $p > .01$). Double-headed arrows represent latent correlations between exogenous variables. Horizontal paths represent autoregressive paths; diagonal paths represent cross-lagged paths. Standardized path coefficients appear in bold. Italicized numbers appearing in the upper right hand of endogenous variables (e.g., dietary restraint [Day 2]) represent the proportion of variance accounted for by associated exogenous variables. In the interest of clarity, manifest variables, error terms, and disturbance terms are not shown. Although unstandardized path coefficients are constrained to equality, standardized path coefficients may vary slightly.

(Gilbert & Meyer, 2005). Finally, the indirect effect of interpersonal esteem on binge eating through dietary restraint was significant. Although usually studied as independent triggers of binge episodes (Isnard et al., 2003), our results suggest interpersonal esteem may bring about dietary restraint, which, in turn, results in binge eating.

Counter to hypotheses, the indirect effect of interpersonal discrepancies on binge eating through interpersonal esteem, depressive affect, and dietary restraint was not significant. This suggests that there is a robust direct relation between interpersonal discrepancies and binge eating. Given their interpersonal hypersensitivity, persons high in SPP may experience interpersonal discrepancies as an aversive form of self-awareness, and binge eating may offer a temporary escape from such self-awareness (Abramson et al., 2006; Heatherton & Baumeister, 1991). Moreover, as predicted by the PMOBE, interpersonal discrepancies and interpersonal esteem were related not only to one another but also to depressive affect and to dietary restraint. Problems with the "social self" (James, 1890) or the "self-in-relation" to others (Guisinger & Blatt, 1994) also appear to contribute directly to binge eating (in the case of interpersonal discrepancies) and to contribute indirectly to binge eating through dietary restraint (in the case of interpersonal esteem). These findings complement Striegel-Moore et al.'s (1993) assertion that "social-self concerns" are related to disordered eating and extend their work by suggesting such concerns include a preoccupation with others' opinions and expectations that is tied to SPP. The structural model for the PMOBE may thus be seen as consistent with work suggesting that binge eating represents a maladaptive coping response to disturbed social functioning (Weissman, Markowitz, & Klerman, 2000).

Finally, and somewhat unexpectedly, the depressive affect–binge eating path was nonsignificant, even though correlational analyses and cross-lagged analyses (see Table 4 and Figure 5) suggested that these two variables were significantly interrelated. In the context of the structural model for the PMOBE (i.e., a multivariate model involving five putative contributors to binge eating), depressive affect may not predict binge eating. Whereas some authors suggest that social maladjustment leads to depressive affect, which, in turn, results in binge eating (Wilfley, Pike, & Striegel-Moore, 1997), the present study indicates that certain forms of social maladjustment (e.g., interpersonal discrepancies) may contribute to binge eating independent of depressive affect. However, given evidence linking depressive affect and binge eating (e.g., McManus & Waller, 1995), caution is suggested in interpreting the null relationship observed between depressive affect and binge eating in the structural model for the PMOBE.

Reciprocal Relations Between Binge Triggers and Binge Eating

The possibility of reciprocal relations between binge triggers and binge eating was explored in cross-lagged analyses (e.g., see Figure 3). Consistent with the PMOBE, and various other studies (e.g., Wilfley et al., 1997), results suggest that binge triggers are temporal antecedents of, and consistent contributors to, binge eating, with changes in binge triggers (on one day) predicting changes in binge eating (on another day) beyond variance accounted for by the previous day's binge triggers and binge eating. A pattern of reciprocal relations was also found between binge triggers and binge eating over time, with interpersonal discrepancies, depressive affect, and dietary restraint appearing to function as both contributors to and consequences of binge eating.

We do not regard these exploratory findings as incompatible with the PMOBE. Instead, we see these results as suggesting an unfolding process between binge triggers and binge eating. Interpersonal discrepancies, depressive affect, and dietary restraint may increase the likelihood of binge eating, and binge eating may, in turn, contribute to the maintenance of these vulnerabilities for binge episodes. Whether interpersonal discrepancies, depressive affect, and dietary restraint represent antecedents and/or consequences of binge eating may thus depend on what point one enters and how long one tracks this unfolding process. The reemergence of psychosocial distress after binge episodes is also consistent with the PMOBE's view of binge eating as an ineffective coping response offering only a short-lived escape from unpleasant con-

textual conditions created by SPP (Abramson et al., 2006; Heatherton & Baumeister, 1991).

Viewed under the microscope of intense daily measurement, three additional findings from cross-lagged analyses stand out. Whereas depressive affect and binge eating were unrelated in the structural model for the PMOBE, cross-lagged analyses showed reciprocal relations between these two variables. The structural model for the PMOBE, which involved aggregating daily measures across 7 days, may have obscured microlevel reciprocal relations between depressive affect and binge eating over time. However, caution is needed in interpreting cross-lagged effects between depressive affect and binge eating, as the structural model for the PMOBE suggests that this link may disappear once other variables (e.g., interpersonal discrepancies) are taken into account. Our results also extend research indicating that dietary restraint induces binge eating (R. I. Stein et al., 2007) and binge eating induces dietary restraint (Stice, 1998b) by suggesting dietary restraint and binge eating influence one another in a reciprocally deterministic manner (e.g., Bandura, 1986). In the present study, we also observed unidirectional relations between interpersonal esteem and binge eating, with only the former predicting the latter over time. These results extend researchers' knowledge of binge eating sequela by suggesting that decrements in interpersonal esteem may result in binge eating, but not stem from binge eating.

Incremental Validity of the PMOBE

As expected, path coefficients in the PMOBE remained substantial and significant after controlling for SOP, suggesting that binge triggers and binge eating are not better explained by a tendency to engage in self-imposed striving for perfection. Although there is still much to learn about the relative contribution of SPP and SOP to disordered eating, our results are generally consistent with research indicating that SPP may be most relevant to bulimia and binge eating (Chang et al., 2008; Pearson & Gleaves, 2006).

SPP also added incrementally to the prediction of binge triggers and binge eating beyond neuroticism. This finding is notable because neuroticism is a broadband, higher order personality domain that encapsulates many negative aspects of personality and that overlaps strongly with psychological distress (Malouff et al., 2005). SPP may represent a unique and a specific lower order interpersonal trait that is neither captured by nor redundant with neuroticism. The ability of SPP to predict binge triggers and binge eating beyond neuroticism is generally consistent with our view that the interpersonal content of the SPP construct is central to the PMOBE. Our findings also join other studies in suggesting that social maladjustment is one domain in which SPP consistently exhibits incremental validity over and above neuroticism (Haring et al., 2003).

Generalizability of the PMOBE

Except for one minor difference involving a factor loading for the measurement model for the PMOBE, factor loadings and path coefficients for the PMOBE generalized across Asian and European participants. This pattern of generalizability complements studies indicating that, as attitudes and as practices specific to ethnic minorities give way to Westernization, Asians and Europeans living in North America are increasingly comparable with regard to risk factors for and patterns of disordered eating (e.g., Shaw et al., 2004).

Nonetheless, there is still a potentially important role for culture in the PMOBE. Cultural expectations may influence Asian Canadians' experience of SPP, with stereotyped expectations of Asians as high-achieving "model minorities" creating a sense of pressure (Chang, 1998; Wei et al., 2007). Moreover, the PMOBE and Asian cultures both emphasize social phenomena, including maintaining social harmony and meeting others' expectations (Castro & Rice, 2003).

Present Limitations and Future Directions

Future studies should address limitations and explore possibilities not dealt with in the present study. For example, our conclusion that the PMOBE generalized across Asian and European participants is, in some ways, limited. A more finely grained analysis of ethnicity is needed. The category Asian, for example, encompasses a diverse group of billions of people. Participants' approach to acculturation (e.g., assimilation), along with other cultural variables (e.g., religion), may also be relevant in examining the generalizability of the PMOBE across ethnic groups. Differences may thus emerge once a more detailed analysis of ethnicity or culture is undertaken (see Wei et al., 2007). The present study also involved an undergraduate sample, which may be seen as a limitation. Given evidence suggesting that binge eating may not occur along a continuum with normalcy (Williamson, Gleaves, & Stewart, 2005), it remains to be seen whether the present results generalize to severe binge eaters. That said, binge eating among undergraduates is a common problem that warrants study in its own right (Keel et al., 2007).

We also used in the present study a once-a-day, end-of-day reporting schedule. Other authors (Smyth et al., 2001) suggest combining event-contingent sampling (requesting reports after episodes of binge eating) with random sampling (randomly requested reports occurring during the day). A more intensive measurement schedule may further clarify reciprocal and temporal relations between binge triggers and binge eating. Researchers have also questioned whether the self-monitoring accompanying daily diary designs may induce reactance (i.e., behavioral change occurring as a result of being assessed or monitored; Affleck, Zautra, Tennen, & Armeli, 1999). Although there is evidence suggesting that reactance is not problematic in diary studies of disordered eating (K. F. Stein & Corte, 2003), additional research is needed to better understand the possible role of reactance in daily diary designs. Another promising future direction is to use moderated mediation to test whether certain paths in the PMOBE differ for some individuals or change under particular conditions (Muller, Judd, & Yzerbyt, 2005). Future studies might, for example, test a moderated mediation model wherein the strength of the indirect effect of SPP on depressive affect through interpersonal discrepancies depends on the tendency to base one's self-worth on other peoples' approval (Crocker et al., 2003).

We also used several scales that were modified versions of established scales. This is a limitation, as less is known about the psychometrics of these modified scales. Additionally, informant reports and direct observations were not collected in the present study. Rather than relying only on participant self-report, future research on the PMOBE should use multiple methods and sources.

Finally, in the PMOBE, SPP is viewed as a temporally stable trait that precedes and produces binge triggers and binge eating. This conceptualization is grounded in research suggesting that SPP and other dimensions of perfectionism are temporally stable and not unduly influenced by mood state or by disordered eating (e.g., Cox & Enns, 2003). Our study cannot, however, rule out reciprocal relations between SPP and binge triggers (e.g., depressive affect). Research on the dynamic interplay among SPP, binge triggers, and binge eating thus represents an important future direction for the PMOBE.

Concluding Remarks

In the present study, we proposed, tested, and supported the PMOBE, an integrative model wherein SPP is seen as a risk factor for binge eating that generates exposure to four triggers of binge episodes. These triggers are conceptualized as a sort of friction that individuals with high levels of SPP generate as they move about in their day-to-day lives—a sort of friction that is likely to ignite episodes of binge eating.

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