

Chapter 1

EATING DISORDERS AND ADDICTION: THEORY AND EVIDENCE

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ABSTRACT

A substantial gap exists between scientific evidence and clinical practice in the psychological treatment of eating disorders. Not only are eating disorders commonly described as addictions by laypersons and mental health professionals alike, but surveys indicate that approximately one-third of eating disorder treatment programs and clinicians use addictions-based psychotherapies to treat eating disorders. However, the validity of the addiction model of eating disorders has received little empirical study and the efficacy of addictions-based psychotherapies for eating disorders remains untested. Understanding the extent of association between eating disorders and addictions has important implications for treatment, prevention, and our understanding of the etiology of eating disorders. This chapter examines issues surrounding the definition of addiction, reviews theoretical reasoning and empirical evidence regarding the addiction model of eating disorders, discusses the construct of “addictive disorder” and identifies future research directions.

INTRODUCTION

A large, sometimes conflicting literature on associations between eating disorders and addictions—sometimes also termed addictive behaviors or disorders—has developed in recent years. A number of reviews of the conceptualization of eating disorders as forms of addiction have been prepared (e.g., Bemis, 1985; Vandereycken, 1990; Wilson, 1991; Wilson, 1993; Wilson, 1999; Wilson, 2000, 2002; Wilson and Latner, 2001). After critically examining empirical and theoretical support for the “addiction model” of eating disorders,¹

¹ Although mention is made here and elsewhere in the literature of an “addiction model” of eating disorders as if there were only one, in fact there are variations, as is discussed later in this chapter. These addiction models

these reviews have generally concluded that neither convincing empirical support nor sound theoretical basis exists for conceiving of eating disorders as addictions. To many researchers, it is a given that conceiving of or treating eating disorders as addictions is unfounded. It is striking, however, that others persistently contend that addictions-based treatment approaches for eating disorders have merit. For example, clinicians have adapted psychotherapeutic strategies from existing addictions treatments for individuals with eating disorders (e.g., Johnson and Sansone, 1993; Johnson and Taylor, 1996; McAleavey and Fiumara, 2001; Riley, 1991; Trotzky, 2002; Weiner, 1998). This ongoing contradiction between research-based recommendations and actual clinical practice suggests a need to carefully re-examine the topic of the addiction model of eating disorders.

Despite a great deal of empirical interest in certain questions related to the addiction model of eating disorders, such as the degree to which eating disorders co-occur with such core addictions as substance abuse, many facets of this model remain unexamined. The dearth of empirical investigation into many aspects of the addiction model of eating disorders may have resulted in part from the absence of systematic information on the frequency of use of addictions-based approaches in the treatment of eating disorders. In other words, it has not been clear in practical terms just how significant an issue the addiction model of eating disorders really is. Until recently, no published studies described the frequency of use of addictions-based approaches. However, results of a recent telephone survey demonstrated that more than a quarter (26.9%) of psychotherapists in a large Canadian city who regularly provided services to individuals with eating disorders often or always folded addictions-based approaches into their eating disorder treatment, and an additional 15.4% of psychotherapists referred clients to adjunctive addictions-based treatments (von Ranson and Robinson, 2006). Thus, a substantial minority (42.3%) of these psychotherapists either used or promoted services with addictions-based eating disorder treatments, indicating that some form of the addiction model of eating disorders is widely embraced by clinical practitioners.

It would be time-consuming and quite challenging—probably prohibitively so—to determine the psychotherapeutic orientations of treatment programs that treat individuals with eating disorders, particularly those available across a wide range of locations. However, the advent of the internet provides an opportunity to describe those treatment programs that have websites. Between October and December 2004, we conducted a systematic survey of English-language internet websites advertising or describing treatment services emphasizing eating disorders to determine what proportion included an addictions component.² This survey identified 177 eating disorder treatment program sites; of these programs, 54 (30.5%) used an addictions-based approach, including 12-step programs, as part or the entirety of their treatment of an eating disorder. Addictions-based treatment programs were located primarily across the United States (87.0%), but sites were also identified in Canada (5.6%), the United

have in common an emphasis on the apparent addictive nature of eating disorder symptoms. For simplicity, we use the term “addiction model” in this chapter to refer to those theories or views of eating disorders that focus on the centrality of addictive elements in the etiology of the eating disorder, its maintenance, or both.

² The search engine used was www.google.ca. Search terms included combinations of “eating disorder,” “anorexia,” and “bulimia” with “treatment,” “addiction,” and “12-step.” As search results yielded very large numbers of hits (e.g., > 2,620,000) and later results tended to be repetitions of previously visited sites or sites that yielded no additional information, not all search results were examined. Instead, the first 100 “eating disorder treatment” websites were examined as well as the first 50 results from the remaining searches. Websites were excluded from this analysis if (1) they were written in a language other than English or (2) did not mention

Kingdom (5.6%), and South Africa (1.9%). Although the eating disorder treatment websites identified are unlikely to constitute a representative sample of eating disorder treatment programs in these locations, it is important to note that the present internet-based findings are quite consistent with those found in the telephone survey described above, which described the psychotherapeutic orientation of psychotherapists in Calgary, Canada (von Ranson and Robinson, 2006). Taken together, these survey findings suggest that addictions-based treatment approaches for eating disorders are widespread across North America and are used by approximately one-third of eating disorder treatment programs and practitioners.

Consistent with findings of professional psychotherapeutic approaches offered, eating disorders are also commonly considered addictions by laypersons. Addictions-based self-help treatments for eating disorders, most prominently Overeaters Anonymous (e.g., Ronel and Libman, 2003), are commonplace across North America. We describe and discuss the tenets of Overeaters Anonymous in detail later in this chapter.

Another important reason to study the validity of the addiction model of eating disorders is that implications for treatment vary dramatically according to differing etiological and conceptual models of eating disorders. For example, cognitive behavioral therapy, widely accepted as the most efficacious treatment for bulimia nervosa (e.g., Fairburn, 2002; Thompson-Brenner, Glass, and Westen, 2003; Wilson and Pike, 2001), is based on a model that emphasizes the role of both cognitive and behavioral factors in the maintenance of eating disorders. The *cognitive-behavioral model* of bulimia nervosa asserts that when women overvalue weight and shape and restrict their food intake in order to achieve the sociocultural ideal of beauty, some become vulnerable to periodic loss of control over eating (Wilson and Pike, 2001). Purging and other compensatory behaviors are used to compensate for the effects of binge eating, but also help maintain binge eating by reducing anxiety about potential weight gain and disrupting learned satiety signals that regulate food intake, both of which contribute to future binge eating (Wilson and Pike, 2001). Cognitive-behavioral treatment of bulimia nervosa centers on reducing dietary restraint and maladaptive attitudes about the significance of weight and shape, establishing regular, nutritionally balanced meals, and introducing previously avoided foods into a more flexible diet (Wilson and Pike, 2001).

In contrast, a prominent *addiction model* of eating disorders asserts that “food addiction” results from a physiological, biochemical condition of the body that creates cravings for refined carbohydrates and other food substances (Sheppard, 1993), such that the patient depends on and is unable to control his or her intake of certain food substances (Haddock and Dill, 1999). Following from this model, treatment of food addiction requires highly structured eating patterns and absolute abstinence from specific “addictive” foods, such as white flour and sugar (Yeary, 1987). Note that treatment recommendations arising from the addiction model—e.g., avoidance of specific foods—are at odds from those arising from the cognitive-behavioral model, the treatment for bulimia nervosa that has the greatest degree of empirical support—e.g., moderation in all food intake.

This chapter reviews the theoretical underpinnings of the addiction model of eating disorders and examines the literature addressing the merits and demerits of considering eating disorders as forms of addiction, with the dual goals of identifying common ground for clinicians and researchers and identifying issues for future research to address. Empirical

research has examined limited questions regarding associations of eating disorders and addictions; however, it remains unclear what, if anything, eating disorders and addictions truly have in common. We examine commonalities and dissimilarities of eating disorders and addictions to determine what further evidence is needed to determine the value—or lack thereof—of conceptualizing eating disorders as addictions, and examine issues including those related to definitions and terminology, psychiatric comorbidity, genetic and family history, and treatment implications. A compelling argument can be made that, ultimately, the value of drawing analogies between eating disorders and addictive disorders (or any other psychiatric disorder, for that matter) is determined by the degree to which it advances our understanding of the etiology and maintenance of eating disorders and contributes to the development of more effective prevention and treatment programs (Wilson, 1991). Hence, the utility of the addiction model of eating disorders is our primary emphasis in the present chapter.

WHY ARE EATING DISORDERS COMPARED TO ADDICTIONS?

Over the past several decades in which eating disorders have come under increased study, they have been frequently likened to addictions, specifically substance use disorders (Szmukler and Tantam, 1984; Vandereycken, 1990). Parallel arguments have been made to consider eating disorders variants of personality disorders, obsessive-compulsive disorder, and affective disorder, on the basis of similar phenomenology, frequent comorbidity, and family history (e.g., Bellodi et al., 2001; Hudson et al., 2003; Hudson, Pope, Jonas, and Yurgelun-Todd, 1983; Lilenfeld et al., 1998). Several commonalities between eating disorders and addictions have been noted, including the following (Davis and Claridge, 1998; Lacey, 1993; Vandereycken, 1990): First, patients with bulimia nervosa exhibit certain addiction-like behaviors and correlates (e.g., preoccupation with the substance, loss of control, craving). Second, they commonly abuse psychoactive substances. Third, high rates of substance abuse among relatives of patients with bulimia nervosa have been reported. Fourth, laboratory findings suggested that eating disorders, like addictions, might involve the endogenous opioid systems. Fifth, some have theorized that eating disorders and addictive disorders may share certain personality features, such as proneness toward impulsiveness. This chapter will address the empirical evidence for these observations.

ARE EATING DISORDERS “FEMININE” ADDICTIONS?

The social construction of mental disorder and addiction provides the basis for a feminist interpretation of the striking gender differences in rates of eating disorders and substance misuse. Some have observed that substance use problems and eating disorders are gendered disorders, in which eating disorders are prototypically “feminine” problems whereas substance use disorders are prototypically “masculine” problems (Reid and Burr, 2000). Eating disorders can be construed as a misguided attempt to impose control over the self, whereas substance use disorders can be viewed as involving a loss or abandonment of control. It is argued that women, who tend to have insufficient power and control in western society,

may struggle to gain some control over their own bodies, resulting in an eating disorder in some, whereas men may have more power and responsibilities than they wish and try to escape through substance misuse (Reid and Burr, 2000). Although these ideas are intriguing, it is unclear how they might explain the tremendous range of individual responses to societal pressures related to masculinity and femininity, including why only some women develop an eating disorder and only some men develop substance misuse, and how some of both genders have neither problem or have both problems. Although admittedly methodologically challenging to study, it would be very interesting to integrate aspects of an approach that considers the meaning of mental disorder symptoms in evaluating empirically determined risk factors for eating disorders.

A SHARED BIOLOGICAL VULNERABILITY?

A popular explanation for the association of eating disorders and psychoactive substance use disorders is that they result from a shared biological vulnerability (Jonas, 1990). The high rates of eating disorders in women and alcohol abuse in men have been hypothesized to be sex-specific expressions of an underlying “addictive” predisposition (e.g., Bulik, 1987). Societal constraints on excessive drinking by women have been theorized to make eating a more culturally available form of substance use and abuse (Bulik, 1987). Below we consider evidence addressing the hypothesis that a shared familial vulnerability toward addiction exists that may manifest differently across genders.

WHAT IS THE EVIDENCE FOR COMORBIDITY OF EATING DISORDERS AND ADDICTIONS?

Many have observed high rates of comorbidity of addictive behaviors with eating disorders. Substance use disorders (or “substance misuse”) and compulsive gambling are recognized as major forms of addictions; although more controversial, some consider other repetitive behaviors—including compulsive sex, shopping, and internet use; kleptomania; fire-setting; trichotillomania; and intermittent explosive disorder—addictions as well (Holden, 2001). While little systematic research has examined whether eating disorders and pathological gambling are consistently linked, one study suggests they jointly occur (Lesieur and Blume, 1993). Individuals report gambling, eating, and using drugs for similar reasons, such as relief of anxiety, boredom, and depression (Lesieur and Blume, 1993). Research on “multi-impulsive personality disorder,” theorized to affect a subset of individuals with bulimia nervosa who demonstrate a wide range of destructive, impulsive behaviors and have a poor prognosis, has examined the co-aggregation of various addictions in bulimic women (Lacey and Evans, 1986). A great deal of empirical attention has addressed the comorbidity of eating disorders and substance use disorders.

COMORBIDITY OF EATING DISORDERS AND SUBSTANCE USE DISORDERS

Reviews of studies examining the comorbidity of eating disorders and substance use disorders have indicated that these disorders co-occur at high rates, particularly among individuals with bulimia nervosa or the binge eating/purging subtype of anorexia nervosa (Holderness, Brooks-Gunn, and Warren, 1994; Krahn, 1991; Lilenfeld, 2004; Mitchell, Pyle, Specker, and Hanson, 1992; Wolfe and Maisto, 2000). Although substance use disorders are not more common among obese binge eaters than controls (Telch and Stice, 1998; Yanovski, Nelson, Dubbert, and Spitzer, 1993), an uncontrolled, community-based study found similar rates of substance use disorders among women with bulimia nervosa and women with binge eating disorder who were unselected for weight status (Dohm et al., 2002). These latter findings suggest that substance misuse may be problematic among some women with binge eating disorder, perhaps particularly those who are not obese, although further controlled research is indicated. The converse effect has also been found: elevated rates of eating disorders and related symptoms have been consistently reported in substance misuse samples (e.g., Grilo et al., 1995; Holderness et al., 1994).

Sampling issues and Berkson's bias. The majority of the above comorbidity studies have been conducted with clinical samples, which result in artificially high rates of comorbidity because people with multiple disorders are more likely to pursue treatment—and thus be included in clinical samples—than those with only a single disorder (Berkson, 1946). Results from the majority of epidemiologic studies, which have the critical benefit of being comparatively unaffected by systematic recruitment biases, differ from clinical studies in suggesting that small but consistent associations exist between eating disorder symptoms and use and misuse of alcohol, tobacco, and illicit drugs (Bushnell et al., 1994; Garfinkel et al., 1995; Kendler et al., 1991; Schuckit et al., 1996; von Ranson, Iacono, and McGue, 2002; Welch and Fairburn, 1998). A minority of community-based studies have found no difference in rates of substance misuse among individuals with bulimia nervosa (Welch and Fairburn, 1996) and anorexia nervosa (Helzer and Pryzbeck, 1988) relative to community controls. Overall, the weight of the evidence indicates that eating disorders and substance misuse co-occur at somewhat higher than expected rates, but associations are not as strong as clinical studies initially demonstrated.

Specificity of comorbid associations. Rather than considering broad associations between these two classes of disorders, it may be important to consider the degree of specificity of association between eating disorders and substance misuse. In other words, is an eating disorder-substance misuse association largely limited to certain types of eating disorder symptoms—such as binge eating, purging, or both—or particular forms of substance misuse, such as nicotine, alcohol, or classes of illicit drugs? Identifying the breadth or specificity of associations between these types of problems has important implications for our understanding of the addiction model of eating disorders. As previously noted, comorbidity of substance misuse is believed to be largely limited to individuals with bulimic symptoms (e.g., Holderness et al., 1994; Lilenfeld, 2004). Some studies have found high rates of comorbidity of substance misuse—mostly alcohol dependence—among individuals with anorexia nervosa (Cantwell, Sturzenberger, Burroughs, Salkin, and Green, 1977; Henzel, 1984; Laessle, Kittl, Fichter, Wittchen, and Pirke, 1987; Schuckit et al., 1996) whereas others have not (Eckert,

Goldberg, Halmi, Casper, and Davis, 1982; Garfinkel, Moldofsky, and Garner, 1980). Unfortunately, because information on the subtype of anorexia nervosa was not included in these studies, it is impossible to determine the influence of recurrent binge eating or purging. Substances other than alcohol have been studied infrequently.

Are certain eating disorder symptoms differentially related to substance misuse? Few studies have systematically compared different subtypes of eating disorders—e.g., restricting anorexia nervosa, binge eating/purging anorexia, and bulimia nervosa—to ascertain whether prevalence rates are higher among eating disorders that involve binge eating, and fewer still have studied non-clinical samples. Consistent with the conclusion that strongest associations exist between bulimic symptoms and alcohol misuse, one large study of individuals recruited from clinical and other settings reported significantly higher rates of alcohol use disorders among women with anorexia nervosa and binge eating or bulimia nervosa, than among women with anorexia nervosa alone (Bulik et al., 2004). However, results from the only epidemiologic study that has examined comorbidity of substance misuse with different types of eating disorder symptoms are at odds with this finding. Specifically, this study found that restricting and bulimic symptoms were *both* modestly associated with adolescent girls' and women's use and misuse of nicotine, alcohol, and illicit drugs (von Ranson et al., 2002). Although some have argued that this study's results may be explained by elevated Type II error due to a lack of statistical power and use of conservative confidence intervals (Hudson, Hudson, and Pope, 2005), correlational analyses are presented that also tend to support the conclusion that no clear difference exists between restricting and bulimic symptoms and substance misuse (von Ranson et al., 2002). Specifically, similar levels of correlations were found between use and misuse of nicotine, alcohol, and illicit drugs across both bulimic and restricting disordered eating symptom groups in adolescent girls (range: $r = .05$ to $.30$). The strongest correlation ($r = .30$) occurred between nicotine use and binge eating and purging symptoms; the remaining correlations were all under $r = .20$. No clear pattern of associations of specific eating disorder symptoms with particular classes of substances emerged (von Ranson et al., 2002). Conclusions were limited by the fact that illicit drugs were grouped together in this study, rather than examined individually or separately by class, and no direct test was provided of correlation strength across types of eating disorder behavior.

In summary, existing evidence generally suggests that binge eating and purging behaviors are more strongly associated than restricting behaviors with substance misuse, particularly alcohol use disorders, although closer examination of associations among eating disorder symptoms and substance misuse among community samples is needed to clarify this issue more definitively. Future research should test associations of eating disorder symptoms with specific substances, including different types of illicit drugs. Individuals with eating disorders may have different motivations for using particular classes of drugs, including managing negative affect, avoiding problems, and appetite control (Stock, Goldberg, Corbett, and Katzman, 2002). It follows, then, that binge eating and purging may manifest different strengths and even directions of associations with varying substances. Individuals who are restricting their food intake may tend to avoid alcohol because of its caloric content, but may seek out illicit drugs that they believe may help them achieve their goal of weight loss. To our knowledge, no research has yet studied these questions.

Is comorbidity of eating disorders and substance misuse uniquely strong? The unique strength of the relationship between eating disorders and substance misuse, relative to other psychopathology commonly comorbid with eating disorders, is also at issue. Evidence of a

uniquely strong relationship between two classes of problems would buttress claims that their association has specific etiologic importance.

Descriptive studies do not support the finding of a special, specific relationship between eating and substance use problems. In fact, some research indicates that rates of comorbidity of anxiety and mood disorders tend to exceed that of substance misuse among individuals with eating disorders or disordered eating attitudes and behaviors (Garfinkel et al., 1995; Laessle, Wittchen, Fichter, and Pirke, 1989; von Ranson, Iacono, and McGue, 2000, 2001). In contrast, other community-based research has described comparable odds of comorbidity of various mood, anxiety, and substance use disorders with eating disorders, with all odds ratios ranging from approximately 1.9 to 2.7, indicating that odds of having a comorbid disorder were two or more times higher among those with an eating disorders compared to those without (Wade, Bulik, Prescott, and Kendler, 2004). We are unaware of any studies that have provided direct, statistical comparisons of comorbidity rates of different psychiatric disorders with eating disorders to ascertain the relative strength of these relationships. Such research is needed to definitively answer the question of whether eating disorders and substance misuse share a uniquely strong relationship, although the weight of the current evidence suggests no such unique link exists.

Given the modest associations of substance use and misuse with eating disorder symptoms in nonclinical individuals, overall the empirical findings suggest that limited conclusions should be drawn about the importance of the comorbidity of eating and substance use problems. Nevertheless, an association appears to exist between these types of disorders.

FAMILIAL TRANSMISSION OF EATING AND SUBSTANCE USE DISORDERS

Several studies have examined patterns of familial transmission of eating and substance use disorders for clues as to whether risk for one problem is associated with risk for the other across generations. Given the existing evidence that both eating disorders and substance misuse are substantially heritable (Bulik, Sullivan, Wade, and Kendler, 2000), a demonstration of shared risk for these problems would strongly suggest a common, possibly "addictive" etiology. However, research consistently indicates these disorders are not cross-transmitted in families (Kaye et al., 1996; Kendler et al., 1995; Schuckit et al., 1996), including when subsyndromal disordered eating-substance misuse associations within individuals are carefully separated from familial associations (von Ranson, McGue, and Iacono, 2003). Although as noted above, many believe that eating disorders and substance use disorders are the product of a common biological vulnerability (e.g., Jonas, 1990), the family study data clearly do not support this hypothesis.

BRAIN CIRCUITS, REWARD AND ADDICTION

An intriguing area of research suggests there may be commonalities in neural circuitry in individuals with eating disorders and individuals with substance misuse. Specifically, addictive behaviors, such as those occurring in eating disorders, may stimulate the

endogenous production of opiates, psycho-stimulants or other analogs of exogenous, addictive substances, as well as naturally occurring neurotransmitters (Grigson, 2002; Holden, 2001; Shaffer, 1996). Elevated levels of endogenous opioids have been reported in studies of anorexia nervosa, bulimia nervosa, and obesity (Grigson, 2002; Lesieur and Blume, 1993), and dopamine neurotransmission, which has been implicated in mediating reward and reinforcement systems in the brain, appears to play a role in eating behavior (Orford, 2001; Wang et al., 2001). Brain imaging research indicates that the availability of obese individuals' striatal dopamine D2 receptors is inversely proportional to their body mass index and is lower than in controls, and the lack of dopamine availability is hypothesized to impact motivation and reward circuit pathways in these individuals (Wang et al., 2001; Wang, Volkow, Thanos, and Fowler, 2004).

Although some addictions researchers believe that long-term changes in reward neural circuitry may help perpetuate behavioral addictions such as eating disorders (Holden, 2001), this theory remains largely speculative. Preliminary support exists for the theory that although bulimic behavior may be voluntary at first, over time it may become compulsive due to chronic dysregulation of brain and vagal nerve pathways (Faris et al., 2000; Holden, 2001). Data are correlational and the specificity of such changes in neural pathways to specific behaviors is unclear, but neurobiology is a promising area for future research.

EXERCISE ADDICTION

Some authors have argued that exercise may have addictive properties, including negative effects akin to dependence (Cockerill and Riddington, 1996). Many individuals with eating disorders, most commonly anorexia nervosa, exercise excessively, typically defined as exercising to the extent that it causes functional impairment or is maladaptive (Davis, Katzman, and Kirsh, 1999). Exercise dependence, then, is hypothesized to be a form of behavioral addiction that may be prominent in individuals with eating disorders. In a recent study that used criteria to define dependence on exercise that were adapted from a measure of severity of substance use disorders, almost half (48%) of a sample of 21 inpatients with anorexia nervosa met criteria for exercise dependence over the previous month (Klein et al., 2004). These authors also noted a strong, positive association of number of exercise dependence criteria met with a measure of anxiety disorder symptoms ($r = .76$), raising the possibility that anxiety may help cause or result from excessive exercise (Klein et al., 2004). These data support the view that many individuals with eating disorders exhibit symptoms of addiction to exercise behavior, and are consistent with other research supporting an association of compulsive exercise in girls with anorexia nervosa, obsessive-compulsive personality, and a propensity toward addiction (Davis et al., 1999). Future research is needed to examine cross-sectional and longitudinal associations among eating disorders, anxiety, and excessive exercise, particularly in nonclinical samples.

PERSONALITY TRAITS

Impulsiveness and negative emotionality. One potential explanation for the frequent co-occurrence of eating disorders and substance use disorders is that individuals with both disorders may manifest personality characteristics related to addiction-proneness (e.g., Feldman and Eysenck, 1986). Substance misuse and bulimic symptoms might both stem from a failure to control impulsive behavior, or failure to consider risks and consequences and a lack of deliberation (Lacey, 1993). Impulsiveness—also commonly termed impulsivity—is an important risk factor for and correlate of substance abuse. For example, evidence indicates that those who abuse substances are more impulsive than those who do not, high impulsivity in childhood predicts later development of substance abuse, and impulsivity negatively affects treatment (Moeller and Dougherty, 2002). The other broad personality dimension that has been associated with alcoholism is negative emotionality, or propensity to experience negative emotions such as anxiety or depression (Mulder, 2002). Negative emotionality and impulsivity may interact to increase risk for alcoholism. Results from a study of a large community sample of men and women indicated that those high in both negative emotionality and impulsivity had the highest rates of alcoholism (McGue, Slutske, Taylor, and Iacono, 1997).

Like substance misusers, individuals with bulimic behaviors and bulimia nervosa tend to be impulsive (e.g., Cassin and von Ranson, 2005; Fahy and Eisler, 1993; Feldman and Eysenck, 1986; Schmidt and Telch, 1990; Steiger, Puentes-Neuman, and Leung, 1991). In contrast, individuals with the restricting subtype of anorexia nervosa tend to be less impulsive than non-psychiatric controls (Fahy and Eisler, 1993). Impulsiveness in bulimia nervosa appears to extend beyond a general association of impulsiveness with psychopathology (Penas-Lledo, Vaz, Ramos, and Waller, 2002) and is associated with poorer outcome of bulimia nervosa treatment (Keel and Mitchell, 1997).

If behavioral symptoms of bulimia nervosa, namely binge eating and compensatory behaviors, are conceptualized as impulsive, might it follow that those with bulimia nervosa, because they manifest multiple “impulsive” symptoms (i.e., both binge eating and purging) tend to be more impulsive than binge eaters who do not routinely use compensatory behaviors? Put another way, is there evidence that bulimia nervosa involves more addictive behaviors than binge eating disorder? No data directly address this question, but two lines of evidence provide initial support for it. First, those with binge eating disorder tend to score intermediately between those with bulimia nervosa and those without eating disorders on measures of general and eating psychopathology (Fichter, Quadflieg, and Brandl, 1993; Hay and Fairburn, 1998; le Grange, Telch, and Agras, 1997) and most scales on a commonly used measure of personality psychopathology, the Minnesota Multiphasic Personality Inventory (Kirkley, Kolotkin, Hernandez, and Gallagher, 1992), as well as impulsivity (Schmidt and Telch, 1990). Second, binge eating severity and frequency are positively correlated with impulsivity in treatment-seeking women (de Zwaan et al., 1994). Collectively, these findings suggest that individuals with binge eating disorder may tend to fall between individuals with bulimia nervosa and non-eating disordered controls on indices of severity of impulsivity, among other psychological features.

An alternate view of the relationship of addiction-related personality traits to bulimic symptoms suggests that a subtype of people with bulimia nervosa have a propensity toward

both impulsivity and negative emotionality. One study reported that women with bulimia nervosa and substance dependence tended to come from families that experienced problems with impulsivity and affective instability, suggesting that a familial vulnerability toward impulsivity and negative emotionality exists among those women who have both an eating disorder and substance dependence (Lilenfeld et al., 1997). According to this perspective, only those bulimic women with substance dependence should demonstrate substantially elevated impulsivity, whereas those women with bulimia but no comorbid substance dependence should be more behaviorally constrained.

On the other hand, some have suggested that, rather than reflecting a stable personality trait, impulsiveness may reflect erratic dietary patterns and emotional instability associated with bulimia nervosa. In particular, one study's findings showed that reductions in binge eating and purging were followed by decreases in emotional lability and other aspects of behavioral disinhibition (Ames-Frankel et al., 1992).

In sum, unravelling the degree to which impulsiveness is a cause of bulimic behaviors, an effect of bulimic behaviors, or both, requires further study. Longitudinal designs are needed to answer these questions. One approach would involve assessing impulsivity in individuals with bulimia nervosa before and after recovery, but the optimal, heavily resource-intensive approach would involve measuring impulsivity before and after the onset of eating disorder symptoms.

Sensitivity to reward. Another personality characteristic proposed as potentially important in the etiology of addiction is sensitivity to reward, or the propensity to derive pleasure or reward from reinforcers such as food or addictive drugs. Initial research supports a hypothesized association between sensitivity to reward and eating pathology. Sensitivity to reward was found to be positively associated with emotional overeating and body mass index in a recent study (Davis, Strachan, and Berkson, 2004). These authors theorized that this personality variable may place one at risk for overeating and overweight; however, longitudinal research is needed to test its validity. Relations among sensitivity to reward, negative emotionality, impulsivity, and eating disorders also remain to be explored.

HISTORICAL VARIABILITY IN THE CONCEPT OF ADDICTION

Any discussion of the validity of the addiction model of eating disorders should include consideration of the meaning of the term "addiction." Historically the limits of the concept of addiction have been inconsistently defined, yielding a moving target of sorts. The classical definition of addiction was quite broad, referring to a habitual or compulsive devotion to an object or activity (*Webster's II New Riverside University Dictionary*, 1988). Beginning in the late nineteenth century, the term "addiction" was increasingly narrowed, and restricted to situations where physical dependence on a chemical substance could be substantiated through the presence of tolerance or withdrawal symptomatology (Walters, 1999). "Addiction" became identified—overly so, in some critics' view—with psychoactive drugs that exert an effect on the central nervous system (Orford, 2001). More recently, the definition has reverted to its earlier status (American Psychiatric Association, 1994) and has been extended to substances that do not appear to promote physical dependence, as well as non-substance related activities (e.g., pathological gambling, sex addiction, work addiction, internet

addiction) (Peele, 1977). According to this revised definition of addiction, any reinforcing behavior is potentially addictive (Walters and Gilbert, 2000).

An ongoing controversy regarding the boundaries of the concept of addiction has been reflected in the differing levels of inclusiveness of the definitions of addictive disorders included in various editions of the Diagnostic and Statistical Manual of Mental Disorders (DSM), the American Psychiatric Association's definitional bible. In DSM-III, the definition of substance use disorders was quite restrictive, requiring the presence of physiological dependence, evidenced by tolerance or withdrawal (American Psychiatric Association, 1980). Individuals' pattern of use was not sufficient by itself for the diagnosis of substance dependence. By contrast, the DSM-III-R class of "psychoactive substance use disorders" incorporated a much broader definition of substance dependence by eliminating the requirement that tolerance and withdrawal be present and by increasing the emphasis on aspects of compulsive use, including loss of control, taking more of the substance than was intended, continued use of a substance despite negative consequences, and the interference with social or occupational functioning (American Psychiatric Association, 1987; Miele, Tilly, First, and Frances, 1990). However, the diagnostic criteria explicitly referred to abuse and dependence of *psychoactive* substances to ensure that the diagnostic criteria were not misinterpreted to include non-psychoactive substances such as food (Rounsaville, Spitzer, and Williams, 1986). The DSM-IV substance use disorders work group considered returning to a somewhat narrower definition of dependence, requiring the presence of either tolerance or withdrawal in addition to the compulsive aspects or problematic consequences of substance use (Miele et al., 1990), but ended up retaining a broader definition which did not require the presence of either tolerance or withdrawal (American Psychiatric Association, 1994). Using this current, broader definition, a number of behavioral syndromes, particularly compulsive and impulsive disorders, appear similar to psychoactive substance dependence (American Psychiatric Association, 2000; Miele et al., 1990).

THE CONTROVERSY OVER EXPANDING THE CONCEPT OF ADDICTION

Whether the concept of addiction should be expanded beyond substance abuse to include behavioral (i.e., non-psychoactive) addictions is quite controversial. Goodman (1990) notes that the DSM omits a number of behavioral syndromes characterized by a prominent addictive component, with the notable exception of pathological gambling. Orford (2001) advocates for broadening the concept of addiction to include not only excessive psychoactive substance use, but also excessive gambling, sexual activity, and eating. However, the DSM's recent return to a broad definition of addiction has been widely criticized both within and outside the mental health field. According to the revised classical definition of addiction, any reinforcing behavior is potentially addictive; thus, in theory, a person could be addicted to virtually anything (Wilson, 1991). This definition has been roundly criticized because it is so vague, subjective, and all-inclusive that it is devoid of pragmatic value and may obscure important differences between addictions despite the similarities in overt presentation (Goodman, 1990; Miele et al., 1990; Walters and Gilbert, 2000). The broadening of the concept of addiction may also have the unintended effect of pathologizing normal behavior.

Kaminer (1990, p. 26) stated, "...what were once billed as bad habits and problems are now considered addictions."

It is important to consider the reasons why narrower or broader definitions of addiction are being advocated, as well as what practical consequences are anticipated by each of the proposed classifications (Marks, 1990a). Ultimately, the classification of behaviors as addictive may reflect the financial, social, and political concerns of clinicians and researchers (Marks, 1990b). As Jaffe noted, "the taxonomy we select depends on our objectives" (1990, p. 1425). There is no getting around the fact that determining the boundaries of addiction, as with defining other forms of psychopathology, is inherently subjective.

Clearly, issues of definition are fundamental in the debate over what constitutes an addiction. The concept of addiction is controversial in part because clinicians, researchers, social policy makers, and laypeople lack a common definition of addiction (Shaffer, 1996). For example, in one study, clients in a drug education class and addiction experts from the American Psychological Association were asked to define the concept of addiction (Walters and Gilbert, 2000). No single symptom or criterion was endorsed by more than half of either group (clients or experts), which highlights the nebulousness of this construct. Both clients and experts associated addiction with impaired control. Significant disagreement in how addiction was defined was found both between and within the client and expert groups. Experts tended to focus on the compulsive aspects of the behavior and the presence of physical dependence (i.e., tolerance and withdrawal), whereas clients emphasized needs and urges to continue a behavior. Clients provided broader definitions of addiction relative to experts and were more likely to include behavioral addictions. One possible impetus for some to desire a broader definition of addiction is that an addiction label may have a responsibility-easing effect, thus alleviating personal responsibility for undesirable behaviors (Walters and Gilbert, 2000).

In addition to the lack of agreement over the essential elements of addictive behavior, addiction is difficult to conceptualize because, like many forms of psychopathology, there are no definitive means (e.g., objective measures such as pharmacological tests) for determining whether a person has this problem. Instead, various indirect or suggestive indicators of addiction have been relied on, particularly the observable characteristics of tolerance and withdrawal (Peele, 1977). *Tolerance* is the need for increased doses of a substance to produce the desired effect and is inferred when an individual shows less of an effect from the taking of a substance over time. *Withdrawal* refers to the constellation of physiological symptoms (e.g., shivering, sweating, vomiting, fever, sleeplessness) that result from cessation of regular administration of the substance. Because the readily observable and quantifiable symptoms of tolerance and withdrawal are no longer required for a diagnosis of psychoactive substance dependence according to DSM, it has become more difficult to determine whether an individual suffers from an addiction (American Psychiatric Association, 1994). Before discussing whether complex problems such as eating disorders merit being considered addictions, it is necessary to come to some agreement about the meaning of addiction.

A PROPOSED DEFINITION OF ADDICTION

As noted earlier, substance dependence, as defined in the DSM (particularly DSM-III, which required the presence of tolerance and withdrawal), is commonly viewed as the prototypical addiction. Because "addiction" does not appear as a diagnosis or concept in existing diagnostic manuals, there is no gold standard definition by which to judge with any degree of certainty whether eating disorders are addictions (Shaffer, 1996). In contrast to substance dependence, people may be less inclined to classify compulsive eating or exercising as addictions because the behaviors are legal and generally more socially acceptable even when uncontrolled, and this acceptance may protect the individual from viewing himself or herself as an addict (Peele, 1977).

Whether eating disorders should be considered addictions hinges on the breadth of the definition of addiction selected. If we were to use an inclusive definition of addiction, such as one that describes behavioral addictions as maladaptive, repetitive sequences of behaviors (Bradley, 1990), many would agree that binge eating, gambling, and excessive attachment to one's work might all qualify as addictions. In contrast, many would agree that these behaviors would not qualify as addictions using a narrow definition that requires the ingestion of exogenous drugs, such as that proposed by Grinspoon and Bakalar (1976, p. 177): "Dependence is a state, psychic and sometimes also physical, resulting from the interaction between a living organism and a drug, characterized by behavioral and other responses that always include a compulsion to take the drug on a continuous or periodic basis in order to experience its psychic effects, and sometimes to avoid the discomfort of its absence." As noted earlier, some consider food to be a drug (Sheppard, 1993).

While these two definitions of addiction fall near the extremes of the spectrum, others fall closer to the centre. For example, Peele (1977, p. 103) proposes the following definition: "Addiction is any compulsive activity or involvement which decreases a person's ability to deal with other aspects of his life to the point where the activity or involvement comprises the dominant source of emotional reinforcement and identity for the person." Other proposed definitions of addiction that do not readily clarify whether eating disorders should be considered addictions include, "things or activities that can reliably and robustly shift subjective experience" (Shaffer, 1996, p. 464), "anything which is sufficiently compelling to engage a person's consciousness so that he can temporarily be relieved from awareness which he finds painful" (Peele, 1977, p. 120), and "a repetitive habit pattern that increases the risk of disease and/or associated personal and social problems" (Marlatt, Baer, Donovan, and Kivlahan, 1988, p. 224). Each definition raises issues depending on which elements are emphasized and how they are operationalized, or translated into concrete symptoms. No empirical data are available to inform the decision of which definition of addiction to adopt.

Goodman (1990) defines addiction as "a process whereby a behavior, that can function both to produce pleasure and to provide escape from internal discomfort, is employed in a pattern characterized by (1) recurrent failure to control the behavior (powerlessness) and (2) continuation of the behavior despite significant negative consequences (unmanageability)" (p. 1403). Recognizing the lack of a gold standard definition of addiction, Goodman (1990) was the first to propose a set of diagnostic criteria for what he termed "addictive disorder" by incorporating and adapting many of the criteria for DSM-III-R (American Psychiatric Association, 1987) psychoactive substance dependence (a chemical addiction) and

pathological gambling (a behavioral or non-chemical addiction). Proposed diagnostic criteria for “addictive disorder” follow (Goodman, 1990, p. 1404):

- a) Recurrent failure to resist impulses to engage in a specified behavior
- b) Increasing sense of tension immediately prior to initiating the behavior
- c) Pleasure or relief at the time of engaging in the behavior
- d) A feeling of lack of control while engaging in the behavior
- e) At least 5 of the following:
 1. Frequent preoccupation with the behavior or with activity that is preparatory to the behavior
 2. Frequent engaging in the behavior to a greater extent or over a longer period than intended
 3. Repeated efforts to reduce, control, or stop the behavior
 4. A great deal of time spent in activities necessary for the behavior, engaging in the behavior, or recovering from its effects
 5. Frequent engaging in the behavior when expected to fulfill occupational, academic, domestic, or social obligations
 6. Important social, occupational, or recreational activities given up or reduced because of the behavior
 7. Continuation of the behavior despite knowledge of having a persistent or recurrent social, financial, psychological, or physical problem that is caused or exacerbated by the behavior
 8. Tolerance: need to increase the intensity or frequency of the behavior in order to achieve the desired effect or diminished effect with continued behavior of the same intensity
 9. Restlessness or irritability if unable to engage in the behavior
- f) Some symptoms of the disturbance have persisted for at least 1 month, or have occurred repeatedly over a longer period of time.

This proposed definition of addiction, which would subsume specific chemical and behavioral addictions, is less susceptible (though not immune) to criticism because it strikes a balance between being sufficiently broad to include some behavioral (non-chemical) addictions, but not overly encompassing so as to be devoid of pragmatic value. Note that it retains the concept of tolerance but omits that of withdrawal. Goodman (1990) notes that the criteria are actually more restrictive than those of the DSM disorders most commonly identified as addictive disorders (i.e., psychoactive substance dependence and pathological gambling) because the present definition requires that certain criteria be met for an individual to qualify for a diagnosis. In contrast, the “a la carte” approach to the definition of substance dependence in DSM-IV requires a minimum of three of seven criteria be met (American Psychiatric Association, 1994). Because Goodman’s definition of addiction (1990) is both explicit and moderate in scope, we use his proposed criteria below to address the question of whether eating disorders should be considered addictions.

SIMILARITIES BETWEEN EATING DISORDERS AND ADDICTIONS

If tolerance and withdrawal are not regarded as essential, defining features of addictions, eating disorders may be considered to share salient features of substance dependence. Might eating disorders be a form of behavioral, non-chemical addiction? Note that exploring this possibility does not require the assumption that all individuals with an eating disorder would necessarily have an addiction. It is reasonable to assume that different developmental pathways may exist to an eating disorder, of which addiction to certain behaviors might be one. Moreover, defining an eating disorder as a form of addiction would depend on an individual's specific symptoms.

Proponents of an addiction model of eating disorders believe bulimia nervosa may be functionally interchangeable with other forms of addiction (e.g., Brisman and Siegel, 1984). Evidence suggests that addictions, including behavioral addictions, have reciprocity. That is, engaging in one form of addiction increases the risk for another, and addictions may covary: as one form decreases, another increases (Haylett, Stephenson, and Lefever, 2004). Empirical research addressing topics related to whether eating disorders are addictions has focused on the similarities of drug addiction with bulimic behavior (in the forms of bulimia nervosa, binge eating disorder, or anorexia nervosa, binge eating/purging type) to a much greater extent than with self-starvation (i.e., anorexia nervosa, restricting type), reflecting an emphasis on the symptom of loss of control of eating rather than on the compulsive dieting that occurs in restricting anorexia nervosa. A contrasting theory suggests that some individuals develop a dependence—or addiction—to starvation (Szmukler and Tantom, 1984). We are unaware of any published empirical research addressing this theory.

Some of the similarities between drug addiction and binge eating mentioned in the literature have included preoccupation with thoughts about the substance, craving for the substance, a repeated urge to use the substance, impairment of social and physical functioning, continued use of the substance despite adverse consequences, loss of control, repeated attempts to stop using the substance, mounting tension until the substance is used, guilt following use of the substance, gradual return of the urge and tension, and use of the substance to temporarily regulate emotions and relieve negative affect (Gold, Frost-Pineda, and Jacobs, 2003; Marks, 1990a; Walters, 1999; Wilson, 1991; Wilson, 2000). Interestingly, many of these symptoms are listed in Goodman's (1990) proposed diagnostic criteria for "addictive disorder"—specifically the four required symptoms (repeated urge to use the substance, mounting tension until the substance is used, use of the substance to temporarily regulate emotions and relieve negative affect, and loss of control while engaging in the behavior), as well as frequent preoccupation with and engagement in the behavior, repeated efforts to control or stop the behavior, and continuation of the behavior despite adverse consequences.

Binge eaters often report eating in response to emotional stress, such as tension, anxiety, anger, boredom, loneliness, or interpersonal conflict; binge eating is then often followed by additional negative affect or guilt, which leads to further binge eating (Abraham and Beumont, 1982; Lingswiler, Crowther, and Stephens, 1989). This self-reinforcing, cyclical pattern is similar to those seen in other states of psychological dependence or addiction (Weiner, 1998), as described in the hedonic homeostatic dysregulation theory of drug dependence maintenance (Koob and Le Moal, 2001). For example, the temporary decrease in

anxiety and tension that accompanies both binge eating and self-induced vomiting has been likened to that associated with alcohol abuse (Cappell and Herman, 1972).

As previously discussed in detail, some have hypothesized that eating disorders and substance dependence may represent alternate manifestations of an inclination to engage in addictive behaviors (e.g., Yeary, 1987), possibly due to a shared genetic predisposition that might include common addictive personality characteristics (Bulik, 1987; Goodman, 1990; Holderness et al., 1994). Theorists have suggested that similar personality traits may be found in individuals with bulimia nervosa as those who abuse psychoactive substances, such as inability to regulate tension, the need for immediate gratification, poor impulse control, and fragile self-esteem (McDougall, 1989). Efforts to identify an “addictive personality” that describes individuals across a wide range of addictions, including both chemical and behavioral addictions, generally have not supported this hypothesis. Research has not identified a consistent personality profile for patients with eating disorders or alcohol dependence (Shaffer, 2000), which has led to skepticism about the existence of an underlying addictive personality that would define risk for one or both of these types of problems (Nathan, 1988; Wilson, 1991).

It is unclear, however, whether appropriately specific questions have not yet been asked. Perhaps a unidimensional “addictive personality” does not serve to convey risk for addictive behaviors. Instead, specific personality traits, or perhaps interactions between personality characteristics, may be important. For example, in one study patients with both anorexia nervosa and bulimia nervosa were found to have high scores on the Addiction Scale of the Eysenck Personality Questionnaire (Davis and Claridge, 1998). These authors suggested that high neuroticism (i.e., negative affect and emotional reactivity), which is characteristic of both anorexia nervosa and bulimia nervosa, is a fundamental feature of an addictive personality, and that secondary traits influence the form of the addiction—for example, high neuroticism combined with high introversion may predispose an individual to develop anorexia nervosa, whereas neuroticism combined with high psychoticism may predispose an individual to develop bulimia nervosa (Davis and Claridge, 1998). Although research has not supported a link with introversion or psychoticism and eating disorders, it has suggested that neuroticism combined with high persistence tend to be associated with anorexia nervosa, whereas neuroticism combined with novelty seeking/impulsivity tends to be associated with BN (Cassin and von Ranson, 2005).

DIFFERENCES BETWEEN EATING DISORDERS AND ADDICTIONS

Despite certain apparent similarities between eating disorders and substance dependence, there are important differences as well (Vandereycken, 1990). The features associated with physical dependence—tolerance and withdrawal—have rarely been described among patients with eating disorders (Vandereycken, 1990; Wilson, 1991; but see McAleavey and Fiumara, 2001). Thus, it is unlikely any individuals with eating disorders would endorse the symptom of tolerance found in Goodman’s (1990) proposed criteria for “addictive disorder.” Individuals with severe eating disorders often spend a great deal of time engaging in behaviors related to their eating disorder, recovering from its effects, or engaging in the behavior when expected to fulfill occupational, academic, domestic, or social obligations. It is

clear that substantial social (Herzog, Keller, Lavori, and Ott, 1987; Mitchell, Hatsukami, Eckert, and Pyle, 1985), occupational (Mitchell, Soll, Eckert, Pyle, and Hatsukami, 1989), and functional (Mond et al., 2004; Newman et al., 1996) impairment occurs among individuals with symptoms and diagnoses of eating disorders. However, substantial individual differences in impairment exist, depending on the severity of the eating disorder (Herzog, Norman, Rigotti, and PePOSE, 1986; Mond et al., 2004).

Addiction is unlikely to be an all-or-none phenomenon (Peele, 1977), and, as noted above, some individuals with binge eating disorder or bulimia nervosa may meet Goodman's (1990) criteria for "addictive disorder" whereas others may not. Relative to individuals who are dependent on psychoactive substances, some individuals with eating disorders may experience less interference with occupational, academic, recreational, social, and domestic activities, although, as noted above, it likely depends on the severity of the illness. No direct comparisons of level of impairment have been made. However, few people with addictions are impaired in every aspect of daily life (Shaffer, 1996), and certain addictions can be regulated without significant interference with one's health or daily functioning (Watson, 1999).

DISTINCTIONS AMONG ADDICTION, DEPENDENCE, COMPULSION, AND IMPULSIVENESS

The term "compulsion," as in "compulsive overeating," has frequently been used synonymously with "addiction" and "dependence," yet there may be important differences among these terms. Behavioral addictions are often described as compulsive to denote an attempt to escape an aversive internal state (negative reinforcement), whereas dependence implies a strong attraction toward something, typically to achieve a pleasurable internal state (positive reinforcement) (Goodman, 1990; Marks, 1990a). Goodman (1990) suggests that addiction results from a combination of dependence and compulsion. As the definition of addiction has become more inclusive, boundaries among addictive, compulsive, and impulsive behaviors have become less clear (Miele et al., 1990). Impulsive and compulsive behaviors are distinguished on the basis of the underlying motivation that drives the behavior. Initially, similar to dependence, impulsive behavior aims to achieve some pleasure, whereas compulsive behavior aims to prevent subjective discomfort. However, as the impulsive behavior escalates in frequency it becomes less pleasurable and more compulsive in nature. Miele et al. (1990) note that many individuals with addictions are initially characterized by high impulsiveness, and then proceed to develop more compulsive characteristics (e.g., use of substance to evade dysphoric states).

According to one study's findings, the binge eating behavior of individuals with bulimia nervosa tended to be more compulsive in nature relative to those with binge eating disorder, whereas the eating behavior of those with binge eating disorder tended to be more impulsive in nature (Raymond et al., 1999); however, impulsive and compulsive characteristics were often present within the same individual. For example, Raymond et al. (1999) found the majority of individuals with bulimia nervosa and binge eating disorder reported a release of tension after binge eating (suggesting compulsive behavior); however, some also reported a sense of pleasure or gratification after binge eating (suggesting impulsive behavior).

Vandereycken (1990) argues that although the behavior of individuals with bulimia nervosa can be described as compulsive, it is the act of purging rather than binge eating that is compulsive, because purging is associated with greater anxiety reduction than binge eating.

ADDICTION MODELS OF EATING DISORDERS

As noted earlier, according to the addiction-as-disease model of eating disorders, binge eating results from a dependence on certain food substances, such as white flour and sugar, which certain individuals are powerless to control. It postulates that food addictions are formed early in childhood when refined carbohydrates are offered to susceptible children, triggering the addictive process (Sheppard, 1993). This addiction model proposes that certain genetically susceptible individuals are powerless over certain foods as a result of a "food allergy" or disease process, not a lack of willpower. The etiology of "food addiction" is thought to lie in a physiological, biochemical condition of the body that produces cravings for refined carbohydrates and other food substances (Sheppard, 1993). According to this approach, effective management of binge eating requires (1) an admission that one is powerless over food and (2) total abstinence from all offending or triggering foods (Bemis, 1985; Ronel and Libman, 2003; Stein, O'Byrne, Suminski, and Haddock, 1999). The self-help group *Overeaters Anonymous (OA)*, modeled after *Alcoholics Anonymous*, is a direct outgrowth of the addiction-as-disease model approach toward eating disorder treatment. Another addictions-based self-help group, founded in 2000, is *Eating Disorders Anonymous*, which, in contrast to *OA's* admission of powerlessness over food, states "we are powerless over our eating disorder" (*Eating Disorders Anonymous*, 2005).

A more radical addiction model, the auto-addiction opioid model, posits that chronic eating disorders may be conceptualized as an addiction to the body's endogenous opioids, specifically the β -endorphins (Marrazzi and Luby, 1986). Appetite dysfunction (i.e., starvation and/or bingeing) and strenuous physical activity are both capable of stimulating endorphin activity. Because of their intrinsic reward properties, these endorphins may be as addictive as the exogenous opiates (Davis and Claridge, 1998). Huebner (1993) argues that anorexics differ from normal dieters in the way they are powerfully and addictively influenced by the endorphin changes induced by starvation and exercise, similar to the way drug addicts are powerfully and addictively influenced by exogenous substances. Although limited evidence addresses this theory, research suggests endogenous opioid peptides may mediate preference for palatable foods, especially those high in sugar and fat, perhaps particularly in women with bulimia nervosa (Drewnowski, Krahn, Demitrack, Nairn, and Gosnell, 1992, 1995).

Because binge eating appears to have both compulsive and impulsive components (Raymond et al., 1999), it has been suggested that optimal treatment should address both of these aspects. Psychotherapy and pharmacotherapy may help alleviate the internal discomforts from which the binge eating had provided escape, but it is equally important to foster the development of healthier, more adaptive resources for meeting the needs which the binge eating had served to gratify (Goodman, 1990). Supportive groups, including 12-step groups, may help achieve this goal (Goodman, 1990).

OVEREATERS ANONYMOUS

The first OA meeting was held in the United States in January 1960 (Haddock and Dill, 1999). It was initially developed to provide support to compulsive overeaters, but was later expanded to include other eating problems, such as bulimia nervosa and anorexia nervosa (Suler and Bartholomew, 1986). Based on the addiction model, the OA philosophy states that food addiction and obesity are the result of a disease process rather than a lack of willpower or moral defect (Haddock and Dill, 1999). In order to arrest the disease process, the individual must rely on a higher power in order to control his or her food addiction. In 1990, an attempt was made to adapt the 12-step philosophy to the area of eating disorders, culminating in the publication of *The Twelve Steps of Overeaters Anonymous* (Johnson and Sansone, 1993).

The Twelve Steps of Overeaters Anonymous are:

1. We admitted we were powerless over food—that our lives had become unmanageable.
2. Came to believe that a Power greater than ourselves could restore us to sanity.
3. Made a decision to turn our will and our lives over to the care of God *as we understood Him*.
4. Made a searching and fearless moral inventory of ourselves.
5. Admitted to God, to ourselves, and to another human being the exact nature of our wrongs.
6. Were entirely ready to have God remove all these defects of character.
7. Humbly asked Him to remove our shortcomings.
8. Made a list of all persons we had harmed and became willing to make amends to them all.
9. Made direct amends to such people wherever possible, except when to do so would injure them or others.
10. Continued to take personal inventory and when we were wrong, promptly admitted it.
11. Sought through prayer and meditation to improve our conscious contact with God *as we understood Him*, praying only for knowledge of His will for us and the power to carry that out.
12. Having had a spiritual awakening as the result of these Steps, we tried to carry this message to compulsive overeaters and to practice these principles in all our affairs (Overeaters Anonymous, 2004).

Clinical anecdotes suggest that at times OA is “remarkably successful” when other treatments have failed, particularly with bulimia and compulsive overeating (McAleavey and Fiumara, 2001). Most members are reported to come to OA as a last resort following many unsuccessful attempts to control their eating, including drastic diets, psychological therapy, alternative therapies, or even surgery (Ronel and Libman, 2003). Unfortunately, the anonymous nature of OA makes difficult an empirical examination of the efficacy of participation.

A recent qualitative study described four major “transformations” experienced by members over the course of their involvement with OA: (1) enhancement of spirituality, (2)

perception of the problem as a disease rather than lack of willpower, (3) acknowledgement of powerlessness and development of self-acceptance, and (4) formation of rewarding, supportive relations with others (Ronel and Libman, 2003). Although OA is not affiliated with any particular religious group and most members report that spirituality had not been an integral part of their lives prior to OA, the aspiration for spiritual growth is the basis for recovery. When OA members submit to a "Higher Power," they become aware of their powerlessness over the addiction disease process for which they are not held personally responsible. Conceptualizing binge eating as a disease beyond the individual's control diminishes feelings of failure and guilt which paradoxically enhances the importance of personal responsibility (Ronel and Libman, 2003). The establishment of group relationships further diminishes feelings of guilt and shame because group members share their experiences and feelings and receive support from one another. Furthermore, OA members learn to satisfy their psychological and emotional needs through relationships with others, rather than using food to deal with feelings of isolation and alienation (Ronel and Libman, 2003; Weiner, 1998).

Overeaters Anonymous has a number of additional benefits. OA simplifies very complex psychological processes and offers a very concrete plan of action which is easy for most members to understand (Johnson and Sansone, 1993). Self-help groups can also enhance self-efficacy and engender hope by helping members feel that they have achieved changes through their own efforts without the aid of a professional. In addition, OA is free, easy to join, and available at times when therapists may not be, e.g., late evenings and weekends (Weiner, 1998).

CRITICISMS OF ADDICTION MODELS AND OVEREATERS ANONYMOUS

Although viewing food addiction as a disease may be helpful in alleviating individuals' sense of personal responsibility for binge eating and obesity, addiction models of eating disorders have been widely criticized on a number of grounds, summarized as follows. First, several key premises of the addiction model—e.g., the notions of food addiction and carbohydrate cravings—have received little empirical support (Stein et al., 1999). Second, the addiction model of eating disorders is overly simplistic. Third, the addiction model lacks parsimony in its explanation of eating disorder symptoms. Fourth, the addiction model does not distinguish between bulimia nervosa and binge eating disorder and does a poor job of accounting for anorexia nervosa. Fifth, treatments based on the addiction model (i.e., total abstinence from certain foods) are at odds with tenets of treatments for eating disorders that have demonstrated efficacy, such as cognitive-behavioral therapy. Each of these points is discussed in detail below.

FOOD ADDICTION

"Food addiction" is characterized by an obsession with food, chronic and compulsive binge eating despite adverse consequences, and loss of control over the amount of food eaten (Haddock and Dill, 1999). Although the addiction model and OA make reference to a food

addiction, it is not the food itself, but an interaction between a person and food—in other words, the *relationship* of the addicted person with food—that defines addiction (Larkin and Griffiths, 1998; Shaffer, 1996). No evidence suggests that foods are inherently addictive, including refined carbohydrates. Most people incorrectly assume that addiction resides as a latent property of an object (e.g., “an addictive drug”; Shaffer, 1996). An individual may be addicted to a substance, but the substance itself is not addictive. Some take it a step further and argue that an addiction is an unnatural or acquired appetite. According to this perspective, food can never be addictive because it fills a basic need and is required for survival (Watson, 1999).

CARBOHYDRATE CRAVING

There is no evidence to support the proposal that individuals with eating disorders experience food cravings as a direct consequence of consuming a “toxic” substance or “trigger” food to which they are sometimes said to be “allergic” (Bemis, 1985). Furthermore, there is no evidence that individuals with bulimia nervosa or binge eating disorder preferentially consume refined carbohydrates during a binge eating episode (Yanovski, 2003). The prevalence of carbohydrate cravings and rate of carbohydrate consumption do not differ significantly between nonobese individuals, obese binge eaters, and obese non-binge eaters (Drewnowski et al., 1992; Yanovski, 2003). The most salient difference between the binge episodes and non-binge meals of individuals with bulimia nervosa and binge eating disorder is the quantity of food consumed, not the proportion of carbohydrates (Walsh, Kissileff, Cassidy, and Dantzig, 1989; Yanovski et al., 1992). Research examining the effect of an opioid antagonist drug, naloxone, on the hedonic properties of sugar and fat found similar reductions in binge eaters and non-binge eaters but reduced the intake of sweet, high-fat foods only in binge eaters (Drewnowski et al., 1992, 1995).

EFFECTS OF FOOD ON MOOD

A critical assumption on which addiction models rest is that food has psychoactive, mood-altering properties (Haddock and Dill, 1999; Wilson, 1991). Well-controlled studies have provided little or no evidence to support this claim (see Haddock and Dill, 1999). The diets consumed by most individuals, including widely available foods, do not typically conform to the prerequisites for diets that alter neurotransmitter biosynthesis (Lieberman, Spring, and Garfield, 1986). In fact, foods demonstrate little pharmacological effect even when consumed in large quantities and in pure form (Lieberman et al., 1986). A review of studies examining the effects of carbohydrates on mood concluded that the mood-altering effects of carbohydrates are either subtle or nonexistent (Christensen, 1996), a fact which seriously challenges the validity of the addiction-as-disease model of eating disorders. Even if food was shown to regulate affect in some individuals, it would not necessarily follow that food is addictive because many activities regulate affect, including health-promoting activities such as meditation (Wilson, 2000).

OVERLY SIMPLISTIC

The addiction model has been criticized for being overly reductionistic (e.g., von Ranson et al., 2003). It focuses exclusively on binge eating because that behavior most closely resembles substance dependence, while neglecting other important characteristics of eating disorders such as purging, dietary restraint, and abnormal attitudes regarding weight and shape (Wilson, 1991; Wilson and Latner, 2001). Many clinicians have raised the objection that treatment programs based on the addiction model are superficial and do not address the deeper psychological issues of the patient, particularly commonly-comorbid personality disorders (Johnson and Sansone, 1993). The emphasis on abstinence from "toxic" foods is also problematic because, unlike drugs and alcohol, food has a role in healthy functioning and is essential for survival. Lifelong abstinence from particular foods is neither realistic nor desirable (Goodman, 1990; Wilson, 1991).

LACKS PARSIMONY

The biobehavioral explanations for food preoccupation and loss of control are somewhat convincing in the context of bulimia nervosa, but less so in the context of binge eating disorder and the restricting type of anorexia nervosa. Although individuals with binge eating disorder often attempt to abstain from certain "forbidden" foods, they are less inclined than those with bulimia nervosa to completely restrict their food intake so should be less susceptible to binge eating (Schmidt, 2000). Individuals with anorexia nervosa-restricting type significantly restrict their food intake, but do not engage in regular binge eating.

Binge eating may also result from the *abstinence violation effect* (Marlatt and Gordon, 1985), a phenomenon described in the addictions literature. According to this view as applied to eating disorders, individuals may categorize foods as either "safe" or "forbidden," and once a forbidden food has been consumed, they believe they have violated a dietary rule, give up, and binge eat. Of the foods consumed by bulimia nervosa patients during binge eating episodes, 69% contained individuals' forbidden foods (Kales, 1990). When forbidden foods are introduced back into the diet and normal, regular eating patterns are restored, both preoccupation and binge eating typically wane (Fairburn, Marcus, and Wilson, 1993).

Although certain similarities between eating disorders and substance dependence are noteworthy, we must also consider alternative explanations for addiction-like symptoms. Wilson (2000) contends that many of the symptoms (particularly preoccupation with food and loss of control) have biobehavioral explanations that do not invoke addiction, and notes that the most parsimonious explanation for these symptoms is that excessive dietary restriction and food deprivation trigger a specific constellation of physiological and psychological symptoms, including food preoccupation and binge eating. These symptoms can develop in food-deprived bulimics as they were shown to develop in healthy males participating in a longitudinal semi-starvation study (Keys, Brozek, Henschel, Mickelsen, and Taylor, 1950); thus, they should not be construed as withdrawal symptoms (Wilson and Latner, 2001). However, not all healthy, food-deprived males experienced food preoccupation and binge eating following food restriction, suggesting that there is not a direct, causal relationship

between food deprivation and binge eating (Keys et al., 1950). Certain individuals may be genetically susceptible to developing binge eating symptoms.

FAILURE TO DIFFERENTIATE AMONG EATING DISORDER TYPES

The addiction model has been criticized for failing to differentiate among the different eating disorders and obesity, treating them all as uniform addictive behavior. It is probably an overgeneralization to state that all eating disorders are addictions (McAleavey and Fiumara, 2001; Vandereycken, 1990). However, a lack of discrimination among eating disorder groups is expected because the addiction model conceptualizes eating disorders as one manifestation of a higher form of substance abuse (Wilson and Latner, 2001). However, there are important differences among the eating disorders. For example, unlike individuals with binge eating disorder, those with bulimia nervosa often restrict their food and compensate for their food consumption, yet, as noted above, the addiction model does not account for differences between those with bulimia nervosa and binge eating disorder. Individuals with the restricting type of anorexia nervosa restrict their food intake without regular bingeing or purging, suggesting they may be addicted to starvation, or the absence of food (Brumberg, 1988; Szmukler and Tantam, 1984). To complicate things even further, individuals with anorexia nervosa-binge/purge type restrict their food, binge, and purge, suggesting they are somehow simultaneously addicted both to food and to the absence of food. The addiction model does not adequately explain the paradox of how a person can be addicted simultaneously to food and starvation (Wilson, 1991). The addiction model has difficulty accounting for the eating behavior of individual with anorexia nervosa since it does not closely resemble the unstructured and uncontrolled consumption of substance abusers (Wilson, 2000). To date no fine-grained analysis or explanation of different symptom patterns associated with eating disorders—such as presence or absence of binge eating, compensatory behavior, and food restriction—has been developed from an addiction-based perspective.

LACK OF EMPIRICAL EVIDENCE

Treatments based on the addiction model prescribe and promote dietary restraint, avoidance of certain foods, highly structured eating, and a sense of powerlessness (Bemis, 1985). In contrast, cognitive-behavioral therapy for bulimia nervosa encourages the establishment of regular, nutritionally balanced meals, the introduction of “forbidden” foods into a more flexible diet, and a reduction of abnormal attitudes about the importance of weight and shape. As stated above, the prescriptions of addictions-based treatments for eating disorders based on the addiction model (e.g., OA) have been widely criticized because they are at odds with empirically supported treatments for eating disorders and may actually contribute to their maintenance (Fairburn, 1997; Walsh, 1993). For example, abstinence rules promote dichotomous thinking (i.e., “safe” vs. “forbidden” foods) and may result in binge eating if a “forbidden” food is consumed due to the abstinence violation effect (Bemis, 1985). Conversely, abstinence rules may also serve as a form of “anorexic skills training” if an individual does abstain from all forbidden foods indefinitely (Vandereycken, 1990). Not only

is there an absence of scientific evidence attesting to the value of the addictions model approach (Wilson, 1991; Wilson, 2000), but the therapeutic objectives of the addiction model may actually have unexpected, negative side effects (Parham, 1995). Vandereycken (1990) asserts that rather than abstaining from forbidden or toxic foods, the abstention target should be directed at all forms of abnormal weight reduction.

ADDITIONAL LIMITATIONS OF OVEREATERS ANONYMOUS

The efficacy of treatments based on the addiction model remain untested. Additionally, a number of additional, specific criticisms have been levied against the OA approach. First, because meetings are conducted by laypeople and run independently, there are no mechanisms for ensuring quality control across groups (Johnson and Sansone, 1993). Second, persuading group members that they are powerless to control their consumption of certain "toxic," addictive foods may promote feelings of low-self efficacy and pessimism regarding the likelihood of returning to a normal lifestyle (Haddock and Dill, 1999). Similarly, feminists assert that promoting powerlessness disempowers the largely female population of those with eating disorders, and also may backfire and intensify binge eating and/or prevent women from developing coping tools to actively deal with their problems (Ronel and Libman, 2003; van Wormer, 1994).

MAKING ADDICTIONS-BASED PSYCHOTHERAPIES MORE COMPATIBLE WITH EFFICACIOUS TREATMENTS FOR EATING DISORDERS

Although the addiction model and its treatment strategies suffer from a number of shortcomings, they may nonetheless contribute to the development of more comprehensive, effective approaches to the conceptualization and treatment of eating disorders (Goodman, 1990). As discussed earlier, OA has a number of beneficial aspects that group members find helpful, including a reliable social support system and alleviation of personal responsibility for binge eating. Criticisms of OA center on its three main themes: powerlessness, abstinence, and religious orientation. However, these aspects may be modified to make them more compatible with evidence-based treatments (Johnson and Sansone, 1993).

As suggested above, feminists have criticized the addiction model because the concept of powerlessness undermines the progress women have made toward greater empowerment, and eating disorders are theorized to stem in part from individuals' attempts to overcome feelings of powerlessness (Ronel and Libman, 2003; van Wormer, 1994). Thus, acknowledging powerlessness would be colluding with the primary problem of the patient. However, Johnson and Sansone (1993) note that the concept of powerlessness is more palatable when it is understood as an effort to identify those things that can be controlled versus those that cannot, rather than generalizing powerlessness to all aspects of life. Thus, OA members are not completely powerless over their problems, but rather, over some aspects of their eating behavior.

Clinicians who practice empirically supported treatments for eating disorders often disapprove of the notion of abstinence as applied to food. Food cannot be easily substituted for alcohol or drugs in the Twelve Steps because it cannot be eliminated from one's life as alcohol and drugs can. Furthermore, strict avoidance of certain foods can contribute to binge eating in some people (Keys et al., 1950). Cognitive-behavioral therapy encourages the development of a regular, flexible eating plan in which no foods are avoided. In a creative, constructive revision of OA's tenet regarding abstinence from carbohydrates, Johnson and Sansone (1993) recommend that rather than abstaining from specific foods, patients abstain from dieting, binge eating, purging, excessive exercise, and setting unrealistic weight expectations.

The religious orientation of 12-step programs makes some people uncomfortable and reluctant to participate in OA groups. However, OA does not insist people accept a specific definition of God and allows flexibility regarding who or what is chosen to define as their "higher power." It also makes a distinction between spirituality and religion. OA may appeal more broadly and be made compatible with more conventional forms of psychotherapy if the concept of higher power is interpreted in a spiritual rather than religious manner (Johnson and Sansone, 1993).

Although OA and other addictions-based approaches may be modified to be more compatible with evidence-based forms of psychotherapy, it does not necessarily follow that eating disorders should be treated using 12-step approaches even if they are conceptualized as addictions. Other psychotherapeutic options which have successfully been used to treat psychoactive substance use disorders include self-help manuals or guided self-help, motivational enhancement therapy, cognitive-behavioral therapy, behavioral self-control training, family therapy, relapse prevention, and medication (Hester and Miller, 1995). Behavioral self-control training and relapse prevention in particular are very similar to cognitive behavior therapy. Behavioral self-control training consists of behavioral techniques of goal setting, self-monitoring, managing consumption, rewarding goal attainment, functionally analyzing high-risk situations, and learning alternate coping skills (Hester and Miller, 1995). Relapse prevention aims to integrate behavioral skills training and cognitive intervention strategies to help individuals anticipate, identify, and manage high-risk situations to maintain behavioral change (Hester and Miller, 1995). Thus, even if a clinician conceptualizes eating disorders as forms of addiction, research evidence suggests that cognitive-behavioral therapy continues to be the optimal treatment for bulimia nervosa and binge eating disorder.

CONCLUSION

In this chapter, we have reviewed theory and evidence related to the view of eating disorders as addictions. In short, there is no simple answer to the question, "Are eating disorders addictions?" As discussed, the answer depends in part on our understanding of the terms we are using. First, how we define "addiction" is at issue, as there is no universally recognized definition for this crucial concept. Debate continues about the merits of considering behavioral addictions as equivalent to other, accepted forms of addiction, although recently there has been growing agreement among some experts that there may be

benefits to broadening the view of addiction beyond the chemical addictions of alcohol and drug misuse (Holden, 2001). This broad conceptualization of addiction is consistent with definitions of substance use disorders found in the current edition of the DSM (American Psychiatric Association, 1994). However, whether eating disorders should be included among the problems defined as behavioral addictions also remains contested. Second, careful attention also needs to be paid to parsing the meaning of "eating disorders" in considering whether they constitute addictions. Do we mean binge eating, purging, other compensatory behaviors, food restriction, excessive exercise, associated cognitive symptoms, or some combination of the above? Systematic study of specific, carefully-defined eating disorder behaviors and subgroups is sorely needed to advance our understanding of whether eating disorders, or aspects of them, have addictive elements. Previous research has often made implicit assumptions about what element(s) of eating disorders may be addictive, yet little research has explicitly addressed the issue of specificity and no clear consensus has emerged.

Research is needed to shed light on the validity of the addiction model of eating disorders. Research on this topic is still at a nascent stage. Studies support neither the existence of a strong, overarching association of eating disorders with addictive disorders such as substance misuse nor the familial cross-transmission of these two types of problems. However, evidence exists for associations between the bulimic symptoms of binge eating and purging, on the one hand, and various indices of addiction, on the other. Promising areas of research examining possible links of eating disorders to addiction include the study of neural reward pathways and personality correlates and predictors of eating disorders. Surprisingly, no controlled studies have yet examined the efficacy of certain addictions-based approaches to treating eating disorders, despite their common use by community psychotherapists. As noted, a substantial minority of clinicians believe it is useful to conceptualize and treat eating disorder symptoms as addictive behaviors; the question remains if this belief is accurate or whether the perceived similarities between the two types of problems necessarily extend to the use of addiction-based treatments. It seems especially important to study the latter question because the tenets of 12-step-based treatments for eating disorders, in particular, run counter to those promoted by cognitive-behavior therapy, the evidence-based treatment of choice for bulimia nervosa and binge eating disorder.

At least two potential directions for future research related to addiction and eating disorders stand out. First, if addictive processes contribute to the development of eating pathology, then improved comprehension of these processes may help to refine prevention efforts directed at identifying those at risk and diminishing the numbers of people affected by eating disorders. Second, if addictive processes contribute to the maintenance of eating pathology, then understanding these processes better may yield new or improved treatment options. Conversely, if addictions-based treatments are found to be ineffective for eating disorders, the prompt dissemination of this information to therapists, patients, and others would be critical. These two important foci of knowledge acquisition related to the addiction model of eating disorders—etiology versus maintenance of eating pathology—should impact the direction of particular research questions.

For example, one means of gathering evidence addressing whether eating disorders should be considered addictions is through systematically researching how individuals with various eating disorders meet proposed criteria for addictive disorder (e.g., Goodman, 1990). According to Goodman's (1990) proposed diagnostic criteria, an undetermined subset of individuals with eating disorders would likely meet criteria for addictive disorder. Because

Goodman's (1990) proposed criteria refer to the existence of a behavior (e.g., eating), rather than the absence of a behavior (e.g., starving—the absence of normal eating patterns), it is unlikely anorexia nervosa-restricting type would be considered an addictive behavior (but see Szmukler and Tantam, 1984). Furthermore, the excessive exercise behaviors of half of a sample of inpatient women with anorexia nervosa was comparable to a series of adapted substance use disorder symptoms intended to assess addiction, although some substance use disorder criteria did not pertain to exercise (Klein et al., 2004). Of all the eating disordered behaviors, binge eating is most likely to be considered an addictive behavior, regardless of the formal diagnosis (i.e., anorexia nervosa-binge/purge type, bulimia nervosa-purging or non-purging type, binge eating disorder). Many individuals who binge eat report a recurrent failure to resist impulses to binge eat (criterion A), an increasing sense of tension immediately prior to initiating binge eating (criterion B), pleasure or relief at the time of binge eating (criterion C), and a feeling of lack of control while engaging in binge eating (criterion D). Many individuals who binge eat also report frequent preoccupation with binge eating (criterion E1), frequently engaging in binge eating (criterion E2), repeated efforts to reduce, control, or stop binge eating (criterion E3), and continuation of binge eating despite knowledge of adverse social, financial, psychological, or physical problems (criterion E7). Whether individuals who binge eat report spending a great deal of time binge eating or recovering from its effects (criterion E4), engaging in binge eating when expected to fulfill occupational, academic, domestic, or social obligations (criterion E5), or reducing their social, occupational, or recreational activities because of binge eating (criterion E6), likely depends on the severity of their binge eating disorder.

It is unlikely that many individuals who binge eat would endorse the symptom of tolerance (criterion E7). Although anecdotal evidence suggests that some individuals with eating disorders experience symptoms of physical dependence (i.e., requiring larger amounts of food to achieve the desired effect and experiencing headaches, sweats, irritability, mood swings, and panic when abstaining from certain foods; McAleavey and Fiumara, 2001), the empirical evidence is quite sparse (Wilson, 1991; Wilson, 2000) and it is uncertain whether these symptoms are truly indicative of tolerance and physical withdrawal. If binge eaters are addicted to food, their dependence on food appears to be a psychological one, without the presence of tolerance and physical withdrawal symptoms (Vandereycken, 1990).

In sum, whether individuals who binge eat would meet these or other criteria for addictive disorder would depend on the severity of their binge eating and the extent of its interference in their lives. To date, no empirical studies have been conducted to examine which particular diagnostic criteria individuals with anorexia nervosa, bulimia nervosa, and binge eating disorder would endorse, or what percentage of individuals with clinically significant eating disorders would meet full criteria for addictive disorder. Such research may help clarify the overlap between the concepts of addictive disorder and eating disorders, and so may ultimately help illuminate the etiology of eating disorders.

AUTHOR NOTE

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