

Social Contagion of Binge Eating

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A social psychological account of the acquisition of binge eating, analogous to the classic social psychological work, "Social Pressures in Informal Groups" (Festinger, Schachter, & Back, 1950), is suggested and tested in two college sororities. In these sororities, clear evidence of group norms about appropriate binge-eating behavior was found; in one sorority, the more one binged, the more popular one was. In the other, popularity was associated with binging the right amount: Those who binged too much or too little were less popular than those who binged at the mean. Evidence of social pressures to binge eat were found as well. By the end of the academic year, a sorority member's binge eating could be predicted from the binge-eating level of her friends (average $r = .31$). As friendship groups grew more cohesive, a sorority member's binge eating grew more and more like that of her friends (average $r = .35$). The parsimony of a social psychological account of the acquisition of binge eating behavior is shown. I argue that there is no great mystery to how bulimia has become such a serious problem for today's women. Binge eating seems to be an acquired pattern of behavior, perhaps through modeling, and appears to be learned much like any other set of behaviors. Like other behaviors, it is under substantial social control.

Bulimia is rapidly becoming *the* women's psychological disease of our time, rivaling depression in its prevalence. It is receiving a great deal of attention in both the scientific community (Gandour, 1984; Schlesier-Stropp, 1984; Striegel-Moore, Silberstein, & Rodin, 1986) and the popular press (Boskind-Lodahl & Sirlin, 1977). Bulimia is an eating pattern characterized by periodic episodes of uncontrolled binge eating alternating with periods of fasting, strict dieting, or purging via vomiting, diuretics, or laxatives. The uncontrolled eating is usually accompanied by negative affect, a sense of loss of control, and guilt. Nearly all of those affected are women (Gandour, 1984).

The evidence is that bulimia is indeed quite prevalent; estimates suggest 4–15% of college women have serious problems with bulimia (Halmi, Falk, & Schwartz, 1981; Sinoway, Raupp, & Newman, 1985; Strangler & Printz, 1980). By contrast, there is little evidence to suggest that bulimia afflicted any more than a handful of people prior to the late 1960s and early 1970s (Rosenzweig & Spruill, 1986).

This article is based on my dissertation at the University of Michigan. Financial support came from an NIMH training grant in health and social behavior to the University of Michigan, the Michigan Alumni Fund, University of Michigan Continuing Education for Women, a Society for the Psychological Study of Social Issues Grant-in-Aid, and NSF Grant SES85-07342 to Richard Nisbett.

Special thanks are due to my committee for their helpful comments and encouragement: Eugene Burnstein, Hazel Markus, Andre Modigliani, and especially to the chairman, Richard Nisbett, whose guiding hand can be seen throughout. This version also profited from discussions with and knowledgeable comments from Monica Biernat, Steve Cardoze, Adam Drewnowski, Martin Gold, Norbert Kerr, Adam Lehman, Judith Rodin, Lisa Silberstein, David Smith, and three anonymous reviewers.

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The sudden and dramatic appearance of bulimia as a set of clinical symptoms has prompted a great deal of psychological and psychiatric theorizing about the roots of the syndrome. Surprisingly little is known about the causes of bulimia. Bulimics seem to be virtually indistinguishable from nonbulimic controls on a surprising number of variables, such as height, weight (Gandour, 1984), sex role orientation (Srikameswaran, Leichner, & Harper, 1984), and even ego involvement with food and eating (Crandall, 1987). There have been three general classes of explanations put forward: a sociohistorical/cultural approach, a clinical/psychiatric approach, and an epidemiological/risk factors approach.

Sociocultural Approach

Sociocultural theorists argue that changing norms in our society, especially those toward thinness for women, have created a cult of dieting (Dwyer, Feldman, & Mayer, 1970; Orbach, 1978). For example, Garner, Garfinkel, Schwartz, and Thompson (1980) have shown that body sizes of the winners of the Miss America Pageant and the Playboy centerfolds have been steadily decreasing over the past 20 years. Apparently, now more than ever, thin is in.

Women have internalized the message that they should care a great deal about how they look and at the same time internalize a thinness norm that is virtually unattainable for most of them (Rodin, Silberstein, & Striegel-Moore, 1984). Initial and subsequent attempts to reach this social rather than biological norm (i.e., dieting) are disruptive to the body's natural balance (Nisbett, 1972), making weight reduction extremely difficult (Bennett & Gurin, 1982; Garrow, 1978). At the same time, because there is a heavy psychological investment in dieting, the success or failure of behaviors related to weight loss attempts are very self-relevant, and strongly affectively tinged.

There is undoubtedly a sociocultural component to bulimia,

because severe binge eating accompanied by an emotional roller coaster among women is a new problem, but social history certainly does not contain a complete account of the phenomenon. Thinness norms have come and gone in the past few centuries, and social roles have gone through dramatic changes as well, both apparently without concomitant increases in bulimia. During the Roaring Twenties, for example, although the flappers were as thin as plastic drinking straws, there is no indication that bulimia was a problem then (Bennett & Gurin, 1982). (The exact data to establish this are very difficult to collect; see Rosenzweig & Spruill, 1986, for one attempt).

More important, however, is that these social pressures operate on all women in the middle-class subculture. Thus, the most difficult problem for the sociocultural perspective is that it fails to specify who is at risk for bulimia and who is not at risk. Although thinness norms and the fear of fatness are everywhere in our society, not all women are in trouble with dieting, binging, and body image. Why beauty norms for thinness work their destruction on only a relative minority of the population is a question that this perspective has a great deal of difficulty in answering.

Clinical/Psychiatric Approach

A wide variety of researchers and clinicians have proposed models of bulimia based on existing psychiatric/clinical models, for example, impulsiveness (Dunn & Ondercin, 1981), feelings of inadequacy or low self-efficacy (Garfinkel & Garner, 1982), borderline personality disorder (Radant, 1986), or parents' psychological health and family structure (Strober, Morell, Burroughs, Salkin, & Jacobs, 1985). One approach claims that bulimia is simply a variant of major affective disorder (Pope & Hudson, 1984).

The clinical approach provides an answer to the "Why this person?" question, which the sociocultural perspective does not: Women experiencing psychological distress are at risk. However, a serious problem for the clinical perspective is the vagueness with which it specifies predisposing factors. The personality and family predisposing factors that have been linked to bulimia can separate bulimics from the normal population, but they cannot successfully discriminate bulimics from other globally defined kinds of psychological disorders such as depression (Cantwell, 1985). Also, it is not clear how feelings of inadequacy or low self-efficacy, for example, should lead to problems with binge eating. In their 240-page book, Pope and Hudson (1984) made a reasonable case for the role of depression in bulimia, but they fail to say anything about why depression should lead to problems with binge eating in particular, or whether depression is a cause or a consequence of the disorder.

Most important, problems such as feelings of inadequacy and impulsiveness have been around for some time, long before bulimia became a major health problem. Unless one is willing to argue that such things as clinical levels of inadequacy or impulsiveness are exhibiting a huge growth, it is hard to claim that they are the cause of bulimia. The crucial issues are, why should such things as depression, impulsiveness, or inadequacy be linked to binge eating, and why now?

Epidemiological/Risk Factors Approach

An epidemiological approach to bulimia focuses on the various factors that can be expected to predict bulimia (Johnson, Lewis, & Hagman, 1984). It is a statistical approach: What are the independent variables one can use to predict the dependent variable of bulimia?

Rodin and her colleagues (Rodin et al., 1984; Striegel-Moore et al., 1986) have reviewed an impressive amount of literature relating to binge eating and bulimia and have outlined the various factors that put a person at risk for bulimia. The list is long and diverse, including body image, affective instability, family factors, hormones, sex roles, stress, exercise, genetic factors, coping skills, developmental factors, and so forth. It seems certain that a number of the factors on this list can be used to predict bulimia, using as they do factors from the entire range of theoretical perspectives.

Though practical, the approach is not parsimonious; the focus for this group of theorists has been on inclusion rather than exclusion. The result has been a large compendium of likely risk factors for bulimia. It is both descriptive and predictive, but the process of acquiring bulimic behavior remains obscure.

A useful tool at this point would be an account of bulimia that is both plausible and parsimonious. It should be plausible in that it fits the known facts about bulimia, and it should be parsimonious in that the phenomenon is not overexplained by many concomitant, nonindependent forces. An appropriate theory should define the people at risk for the disorder as well as those not at risk. A good theory should also describe the process of acquiring the symptoms themselves.

None of the existing theories can do all of these things. Although the sociocultural approach can define who is at risk, it neither effectively defines who is not at risk nor how bulimics acquire the binge-eating behavior. The clinical perspective is well suited to defining who is at risk and who is not at risk but has not carefully spelled out how it is that the symptoms are acquired. The epidemiological approach, like the clinical approach, is better suited to defining risk factors than to describing processes of symptom acquisition. I wish to propose a model that is well suited to describing the symptom acquisition process, based on social psychological processes.

Social Psychological Factors

There is good reason to think that social processes are implicated in various ways with respect to bulimia and binge eating. Anecdotal evidence suggests that bulimia tends to run in social groups, such as cheerleading squads (Squire, 1983), athletic teams (Crago, Yates, Beutler, & Arizmendi, 1985), and dance camps (Garner & Garfinkel, 1980). There is also indication that the onset of eating disorders follows entrance into the group (e.g., Crago et al., 1985), suggesting that social pressure might be involved.

There is a great deal of speculation about social psychological factors of bulimia by clinicians and the popular press. In *The Slender Balance*, Squire (1983) tells the story of a cheerleader, Laura, who

explains matter-of-factly "everyone on the [cheerleading] squad binges and vomits. That's how I learned." . . . Laura considers her

behavior frightening and awful, except in one context: before cheerleading a game. "Everybody does it then, so it doesn't seem like the same thing." (p. 48)

One of the most interesting and yet underexamined processes in bulimia is the acquisition of bulimic behavior, particularly binge eating. The few studies that have looked at this problem have focused almost exclusively on particular social groups, for example, dance camps (Garner & Garfinkel, 1980) and athletic teams (Crago et al., 1985).

This focus is not an accident. I wish to argue that social groups are at the very heart of the issue of symptom acquisition. Symptoms are spread from one member to another in these groups, and group membership is at the heart of the transmission. Groups that are most likely to transmit the symptoms of bulimia, most notably binge eating, are groups that are made up almost entirely of women of the same age. This includes dance camps and athletic teams as well as sororities, all-women dormitories, or workplaces comprising mostly women.

Social groups are important to us. They serve to tell us who we are (McGuire & Padawer-Singer, 1976), what to think (Cantril, 1941), and how to behave (Sherif, 1936). The more we value the social group, the more we are willing to be influenced by it.

The power of a group may be measured by the attractiveness of the group for its members. If a person wants to stay in a group, he will be susceptible to influences coming from the group, and he will be willing to conform to the rules which the group sets up." (Festinger, Schachter, & Back, 1950, p. 91)

Members of the same social group tend to be relatively uniform in the attitudes and behaviors that are important to the group (Festinger, 1954). When a particular individual deviates from the group, social pressures are brought to bear to bring the prodigal back into the fold via direct communication, emotional support, or disapproval. Ultimately, the deviate is rejected if he or she fails to conform (Schachter, 1951).

I wish to argue that social pressures in friendship groups are important mechanisms by which binge eating is acquired and spread. Social groups such as athletic teams, cheerleading squads, dormitories, and sororities develop social norms about what is appropriate behavior for their members. If eating, dieting, and losing weight are important to the members, then norms will arise in the group defining how much, when, and with whom. Deviation from these norms will result in rejection from the group, as evidenced by a reduction in the person's popularity (Schachter, 1951). Thus, not only is there likely to be modeling of the behaviors and attitudes associated with bulimia, but there are likely to be sanctions for counternormative behavior.

People are very motivated to imitate or model attitudes or behaviors that are important, characteristic, or definitional to the social group. The more important the social group, and the more central a behavior is to the group, the greater the pressure toward uniformity and the more likely that members of the group will imitate each others' behavior (Festinger, 1950). Friends should become more like each other as they spend time together and grow closer. If binge eating is an important or meaningful behavior to a social group, then over time within groups, people's binge-eating patterns should grow more similar.

Social Pressures in Informal Groups

A classic investigation of the effects of social norms on group life is the study of *Social Pressures in Informal Groups* by Festinger et al. (1950). Their study provides a template to examine how social influence affects binge eating. Festinger et al. were interested in how social norms about attitudes toward a tenant organization were related to popularity and communication patterns within a housing project. Two housing arrangements were studied, Westgate and Westgate West, which were adjoining but physically and architecturally distinct. In Westgate, social groups were defined by courts of grouped houses, ranging from 7 to 13 homes. In Westgate West, social groups were apartment buildings with ten apartments in each.

In Westgate, Festinger et al. (1950) found that the different groups had different norms about the attitudes to take toward the tenant organization; some courts were strongly in favor of the organization, and some were strongly against it. When the court's prevailing attitude toward the tenant organization was positive, those who had negative attitudes toward the organization were less well liked, and when the court's prevailing attitude was negative, those who had a positive attitude were less popular than others.

In Westgate West, the normative pattern was different. Tenants of all of the apartment buildings had primarily favorable attitudes toward the tenant organization. (Westgate West was occupied after the tenant organization had already been established, so that the more controversial aspects of the organization were less salient to the occupants of Westgate West.) There was no correlation between attitude and popularity in Westgate West; those who did not share the generally positive attitude toward the organization did not suffer in terms of popularity. Festinger et al. (1950) interpreted this to mean that, although the overarching group norm was a positive attitude, local group norms were neither salient nor particularly strong.

Festinger et al. (1950) studied existing social groups at one point in time (although the comparison between Westgate and Westgate West is implicitly temporal). But social groups have a dynamic life cycle: Groups form, exert pressures on their members, go up and down in cohesion and uniformity, and eventually disband (Moreland & Levine, 1982). Groups usually do not form with ready-made cohesion; when groups are new, one should not expect pressures toward uniformity to have taken effect. It is only after some amount of time that individuals should become more like the other group members. As more information is shared among members, and as the groups become more cohesive, similarity among group members on binge eating should increase.

Festinger et al. (1950) also reasoned that as group pressures increase in strength, characteristics of the person should decrease in importance. They argued that the amount of time one expected to stay in the housing project should be correlated with how much one is concerned with the quality of life there, and so one's expected length of stay would normally be associated with a positive attitude toward the organization. This was true for the Westgate West complex, where norms were weak. However, at Westgate, in the presence of strong local norms about the tenant organization, anticipated length of stay was uncorrelated with attitude.

With respect to binge eating, however, social pressures are not likely to remove completely the importance of personal characteristics, because, in addition to social psychological factors, other psychobiological and psychiatrically relevant variables are likely to affect the behavior. A variety of factors might be important (Striegel-Moore et al., 1986). A woman's weight puts her at risk; the heavier she is, the more likely she is to feel pressure to diet, which puts her at risk for binge eating (Polivy & Herman, 1985). Her general psychological health is also likely to be a factor; the poorer her mental health, the more likely she is to acquire binging. Furthermore, the lower her self-esteem, the more likely she is to be open to social influence (Janis, 1954).

One social group that is ideally suited for studying such questions as they apply to binge eating is the college sorority. There is anecdotal evidence that sororities are breeding grounds for eating disorders (Squire, 1983), so that one is likely to find a range of binging severity in such a group. Second, women in a sorority are, on average, very interested in physical appearance, weight, and body shape (Rose, 1985), which is a risk factor for bulimia (Johnson et al., 1984; Striegel-Moore et al., 1986).

But most important, sorority membership is a very powerful source of social influence. Much of a sorority woman's social and academic life revolves around the living group, in addition to the more mundane aspects of life, such as sleeping, eating, laundry, and so forth.

From the point of view of social impact theory (Latane & Wolf, 1981), a sorority will have a dramatic impact on its members' lives. It is large enough to generate a strong consensus, the strength of the group is high due to its high degree of attractiveness to members, and the continuing closeness of other members in the sorority ensures the immediacy of their impact.

Finally, a sorority has the distinct advantage of being a well-defined social group with clearly discernible boundaries. With such a social group, one can obtain a fairly clear picture of the social influence patterns in a substantial portion of these women's lives.

If social pressures in friendship groups play a role in the acquisition of binge eating, a variety of research questions present themselves. To what extent are there group norms about binge eating? What role does binging play in determining social acceptance or rejection? To what extent are there social pressures toward uniformity in binge eating? Do women come to have binge eating behavior that resembles that of their friends over time? These questions were looked at in two consecutive studies of 163 women living in sororities.

Method

Overview

Two different sororities were investigated during two different academic years. In Study 1, one sorority was studied in the spring only. In Study 2, two sororities were studied in both the fall and spring. Subjects responded to questions of three general sorts: social ties, personal factors, and binge eating. Social ties were measured by having subjects list their friends within the sorority; this served as information to distinguish subgroups or cliques, as well as popularity. Personal factors were used to some extent to help define those women most at risk for binge

eating. These included, among other things, self-esteem as a rough measure of a woman's general psychological health, and height and weight.

In Study 1, Sorority Alpha was contacted. The sorority members filled out questionnaires anonymously, 3 weeks before the summer break. In Study 2, both Sorority Alpha and a second house, Sorority Beta, filled out a modified version of the questionnaire. They filled out the questionnaires both in the fall, shortly after "rush" (when new members are selected by the sorority to move in during the following year) and again the spring (as in Study 1). Because social influence takes some time to operate, it was expected that there would be relatively little evidence of social pressures operating in the fall data collection, after only 6 weeks of contact.¹ In the spring, however, after 7 months of steady and intense contact, ample opportunity for pressures toward uniformity to operate was expected. This two-wave design of Study 2 also allowed for comparison over time. If social pressures were operating, then the individual sorority member's levels of binge eating should change over time, and these changes should be predicted by those social influences. In the presence of social influence, whether it is active social pressure or simply modeling, friends should grow more alike.

Subjects were active members of two different college sororities (all female). The sororities were both popular and highly sought-after houses at the campus of a large state university. The sororities were paid \$150 for each wave of the study.

Subjects were given questionnaires, characterized as "a study of community and sorority life." The questionnaires were given out only to those women actually residing in the sorority house (made up of mostly sophomores and juniors). The pledge class (new recruits) and inactives (mostly seniors living outside the house and relatively removed from sorority life) were not included in these analyses. Responses to the questionnaire were completely anonymous. A code sheet was prepared by a member of the sorority's executive council; code numbers were used instead of names to investigate the social networks within the sororities.

Design

In Study 1, women from Sorority Alpha filled out a nine-page questionnaire in the spring ($n = 46$), a few weeks before the sorority closed down for the end of the term. In Study 2, members of both Sorority Alpha ($n = 51$) and Sorority Beta ($n = 66$) filled out questionnaires of seven pages in the fall and five pages in the spring, at the same time of year as in Study 1.²

Subjects. A general description of the subjects can be found in Table 1. Height, weight, and age were included in all forms of the questionnaire. Parents' educational status, as a proxy for social class, was included in Study 2 only on the fall questionnaire. The body-mass index found in Table 1 is a measure of overweight, or "fatness" (Sjostrom, 1978), and is calculated by the formula: weight (kg)/height² (m). The body-mass index correlates highly (>.90) with other common measures of overweight, such as the ponderal index and deviation from the Metropolitan Life Insurance tabled norms for height and weight.

Questionnaire

The three versions of the questionnaire from the three waves differed slightly from each other, but there was a central, invariant core to all of them. (Across sororities all questionnaires were identical at any given time. Only the core questions are discussed in this article.)

Binge eating. Bulimia was measured by the Binge Eating Scale (BES;

¹ Presumably, a substantial portion of the social impact of the sorority on its members dissipates over the summer.

² There is, of course, no one who is in both Sorority Alpha and Sorority Beta. However, there is some degree of overlap (40%) within Sorority Alpha over the two studies.

Table 1
Demographic Description and Design Overview

Variable	Sorority Alpha			Sorority Beta	
	Spring ₁	Fall ₁	Spring ₂	Fall ₂	Spring ₂
Sorority size	46	52	44	66	61
% response rate	100	98	82	100	92
Mean age (years)	19.8	19.5	19.7	20.4	20.6
Weight (kg)					
M	55.8	54.3	55.8	58.2	58.6
SD	5.8	6.3	6.4	6.9	6.5
Body-mass index					
M	21.0	20.6	21.0	20.9	21.3
SD	1.6	1.7	1.9	2.0	2.7
BES scores					
M	13.9	13.7	11.5	11.8	10.1
SD	6.1	6.9	5.8	8.2	7.1
Height (m)					
M	1.63	1.62	1.62	1.69	1.68
SD	0.05	0.06	0.06	0.06	0.07
% fathers with graduate or professional degree	54	58	—	43	—
% mothers with graduate or professional degree	22	32	—	23	—

Note. Subjects were measured in the spring and fall. Subscripts on seasons indicate either Study 1 or Study 2. Dashes indicate that parents' educational data were not collected for the second wave of Study 2. BES = Binge Eating Scale.

Gormally, Black, Daston, & Rardin, 1982). The 16-item BES was designed to assess the criteria for bulimia defined by the *Diagnostic and Statistical Manual (DSM-III)* of the American Psychiatric Association (1980), but has the advantage of providing a continuous measure rather than a classification of bulimic versus not bulimic. All of the *DSM-III* aspects of bulimia were measured: binge eating, purging (either by vomiting or by restrictive dieting), the emotional consequences of binging, inconspicuous eating during a binge, and so forth. Previous research at the same university has found the BES to have a one-factor solution; all items load substantially on the first factor. It has a 2-month test-retest reliability of .84. Further validation materials are available (Gormally, 1984; Gormally et al., 1982).

How severe was binge eating in the sororities? Only a handful of the nearly 160 different subjects had high enough scores on the BES to be worthy of professional attention; almost all of the binge eating described here is at subclinical levels. However, binge eating was significantly higher in the sororities than subjects in two all-women dormitories ($n = 86$) measured at the same time as Study 1, $t(131) = 2.47$, $p < .01$.³ Women with low BES scores reported that they were able to stop eating when they wanted to; they did not feel they had trouble controlling eating urges, and did not think a great deal about food. Women with high BES scores reported frequent uncontrollable eating urges, they spent a lot of time trying not to eat any more food, and had days where they could not seem to think about anything else but food. Women with moderate BES scores reported a compulsion to eat "every so often"; they spent some of their time trying to control eating urges and had brief periods of total occupation with thoughts of food.

Social networks. To uncover the pattern of social ties within the houses, respondents were asked to list their "ten best friends (within the house), in order." Popularity was defined as the number of times one was chosen by other people on their lists of friends. These data were also used to form friendship clusters or cliques, via cluster analyses. Membership in clusters was nonoverlapping; no woman was assigned membership in more than one social group.

The cluster analyses were performed on a square n by n matrix of friendship choices (the "top ten"). In this matrix, rows represented a subject's friendship choices, and columns represented subjects being chosen. Choices were weighted from 10 (*top choice*) to 1 (*10th choice*), and then divided by the weighted sum of all of the choices, $n(n + 1)/2$, so that the weighted choices summed to unity for each set. The diagonal of the matrix, which represents self-choice (all zeros, as no one chose herself from her list of friends), was replaced with ones. The result of this is that being chosen by others in the friendship groups was more important to cluster assignment than sharing choices of other people in common. Thus, friends who chose each other and had similar patterns of friendship choices were put into the same cliques by the cluster analysis. Euclidean distances were used as a measure of similarity, and an average linkage criterion was used to join cases to clusters. Using different measures of similarity, different linkage criteria, a different weighting of the variables, or different values along the diagonal had little effect on the solutions. Separate cluster analyses were performed for each sorority at each time period, so that friendship cliques were determined for each wave of the study. These analyses resulted in an average of 10.0 ($SD = 2.9$) friendship clusters in each sorority at each time period, with an average of 5.1 ($SD = 2.3$) persons in each cluster.

Festinger et al.'s (1950) study differs from ours in that they were fortunate enough to have relatively equal-sized groups of individuals, whose members were randomly assigned to membership. In this study, groups were uncovered on the basis of friendship choices rather than being independent of them. The drawback to this is that friendship clusters were almost uniformly cohesive, based as they were on the similarity of their friendship choices. No friendship cluster contains a true isolate. Because groups were based in large part on reciprocated friendship choices (mutual popularity), finding group members particularly low in within-group popularity was relatively difficult.

Self-esteem. As a brief global measure of psychological health, a six-item version of the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) was included. Among college students at the same university, the RSE correlated with the Eysenck Neuroticism Scale at $r = -.55$, with the Beck Depression Inventory at $r = -.62$, and with the Spielberger Trait Anxiety Scale at $r = -.69$.⁴ Self-esteem is also likely to be an important factor in that those low in self-esteem are more likely to be open to the influence of their peers, compared with those high in self-esteem (Janis, 1954).

Results

Social Norms

The first issue for understanding how social norms work is to uncover their existence and patterns. To look for social norms, we traced the patterns of popularity within each of the social groups. If there are indeed norms about binge eating within a group, then deviation from those norms should be associated with a reduction in popularity. The less conforming to a binge eating norm one is, the more one is likely to be sanctioned through a reduction in popularity.

By the same token, whatever the most popular people do in any group is defined as normative. If the norm for binge eating is at the mean level of binging in the sorority, with absolute devi-

³ I collected data from two all-women dormitories with a very similar questionnaire at the same time as Sorority Alpha, Study 1, hoping to compare the dormitories to the sororities. Unfortunately, the response rate was much too low in the dormitories (42%) to study social networks, and so the data are not discussed further here.

⁴ I am grateful to Jonathan Shedler for making these data available.

ations from the mean representing deviations from the norm, then distance from the mean represents social deviance. In Sorority Alpha, this measure of social deviance correlated with popularity at $-.30$ in Study 1, and $-.25$ in Study 2, for spring. In this sorority, the highest levels of popularity were among moderate bingers; binging both too little as well as too much were associated with reductions in popularity. These data are summarized in Table 2.

In Sorority Beta, a different pattern emerged. Surprisingly, in this group there was apparently a social norm that promoted binge eating; the more a woman binged, the more popular she was ($r_s = .28$ for fall and $.32$ for spring). (The actual data peak in popularity was empirically determined to be not at the top of the binging severity distribution, but about $1.3 SDs$ above the mean, or about $1.2 SDs$ below the highest end.) Thus, there was evidence for social norms in support of some level of binge eating in both Sorority Alpha and Sorority Beta. The norms appeared to be somewhat different. In Sorority Alpha, a moderate level was associated with greater popularity. In Sorority Beta more binge eating was associated with more popularity.

It is somewhat surprising to find in Sorority Beta that more binging and more popularity went hand-in-hand. It is possible that the popularity of binge eaters was inflated if those women who binged the most in Sorority Beta all chose each other exclusively, whereas the women who did not binge as much spread their choices out among bingers and nonbingers alike. On the other hand, if a higher degree of binge eating was actually associated with greater popularity, then groups with high levels of binging should have been more prestigious within the entire sorority. To test this, average levels of binge eating in the cliques were calculated and correlated with a measure of group prestige: the percentage of out-group members who chose people within that group (i.e., the average amount of times in-group members were chosen by the out-group). This calculation is presented in the third line of Table 2. The prediction was borne out; the groups that binged the most were the most prestigious in Sorority Beta. The companion effect is also shown for Sorority Alpha. The more deviant the group was from the mean level

Table 3
Pressure Toward Uniformity in Social Groups

Variable	Sorority Alpha			Sorority Beta	
	Spring ₁	Fall ₂	Spring ₂	Fall ₂	Spring ₂
Contagion coefficient	.30†	.00	.21*	-.15	.40††
% choices made in-group	81.6	87.2	89.4†	82.3	85.4††
Deviation from friends in fall with how binging changed over time	—	—	—	-.36†	-.34††

Note. Correlations are based on ns of 46, 51, 36, 66, and 55, respectively. Subscripts on seasons indicate either Study 1 or Study 2.

* different from $-.08$ at $p < .05$, one-tailed. † $p < .05$, two-tailed. †† $p < .01$, two-tailed.

of binge eating, the more it suffered from a reduction in prestige.

Not only were high-binging groups more popular in Sorority Beta, but also within social groups, those who binged more were better liked. In the bottom row of Table 2, the correlations between within-group popularity⁵ and level of binging (adjusted for each group mean) are described; again, Sorority Beta demonstrated a norm in support of greater binge eating.

Festinger et al. (1950) found that, within groups, those who deviated from the local group norm were less popular than those who followed the norm. This suggests that, within friendship clusters, the more a woman deviates from her group mean, the less popular she should be. The patterns of correlations between within-group popularity and within-group deviance did not support this prediction, however; in the spring they ranged from $-.15$ to $.16$, and averaged $.03$ (all ps were ns). The inability to find the effect was largely due to the manner in which social groups were defined in this study. Because mutual choice and reciprocity were used in the cluster analysis, no social groups could have had true isolates, and thus the variability among group members was likely to be greatly attenuated.

Table 2
Patterns of Popularity and Binge Eating

Variable	Sorority Alpha			Sorority Beta	
	Spring ₁	Fall ₂	Spring ₂	Fall ₂	Spring ₂
Popularity and deviation from mean of binging	-.30†	.12	-.25	-.02	-.12
Popularity and binging	-.02	-.04	-.06	.28†	.32†
Prestige of group and group's normative binge level (aggregate)	-.80††	.33	-.53	.61†	.60†
Popularity within-group and within-group level of binge eating	-.10	.16	-.04	.22*	.36††

Note. Correlations are based on ns of 46, 51, 36, 66, and 55, respectively. Correlations between prestige and group's normative binge level were calculated with groups as the unit of analysis; the numbers of groups were 7, 9, 8, 12, and 14, respectively. Subscripts on seasons indicate either Study 1 or Study 2.

* $p < .05$, one-tailed. † $p < .05$, two-tailed. †† $p < .01$, two-tailed.

Pressures Toward Uniformity

In the presence of social norms in a valued social group there will be pressures toward uniformity. If a woman's friends are binge eaters, then the likelihood that she is also a binge eater increases. This is the crux of the social psychological account of the acquisition of bulimic behavior, and it is represented as the contagion coefficient in the top line of Table 3.

The contagion coefficient is a calculation based on the social networks analysis previously described. Subjects were sorted into social friendship clusters (cliques) by means of a cluster

⁵ Within-group popularity is based on the percentage of people within a person's group choosing her. Because smaller clusters are likely to have more reciprocal choices just by chance (a group of two is sure to have 100% reciprocity), each person's percentage choice was divided by the group's average percentage within choice. Each group's mean thus becomes 1.00; numbers above that indicate higher within-group popularity, numbers below it, lower popularity.

analysis. The contagion coefficient is the Pearson r between a woman's binge-eating level and the average binge-eating level of her closest friends in the sorority (statistically, this is the correlation between her own BES score and the average BES score of her cluster-mates, not including the target subject). The contagion coefficient is a behavior-to-behavior model of influence; it asks the question, To what extent is a woman's binge eating like that of her friends?

The answer, apparent from Table 3, is "considerably." In the fall, after only 6 weeks of interaction within the friendship cliques, there was no indication that friends were more like each other than any other sorority member ($r_s = .00$ and $-.15$, for Alpha and Beta, respectively). However, after 7 months of interaction, friends had become more uniform (r_s ranged from $.21$ to $.40$).

It is important to note that the expected value for the contagion coefficient under the null hypothesis is not in fact $.00$, because when a woman is removed from the population, the mean of that population, and hence the expected value of the sample of friends, is shifted slightly in the opposite direction. To ascertain exactly what size correlation to expect by chance, a Monte Carlo study based on 200 randomly generated data sets was performed for each of the sororities.⁶ These analyses yielded, under the null hypothesis, expected contagion coefficients of $-.09$ for Sorority Alpha in Study 1, $-.08$ for Sorority Alpha in Study 2, and $-.07$ for Sorority Beta.

The time difference is probably due to two effects. First, social influence probably would require more than 6 weeks to have any appreciable effect on a woman's binge eating. Second, the more cohesive the group, the more influence it should have over its members.

The second row of Table 3 indicates that, in fact, cohesion increased over time. "Percentage choices made within group" is the total number of in-group choices made, divided by the total number of in-group choices possible. Because the subjects made 10 friendship choices, and the average cluster size was 5.1 members (and the members did not choose themselves), 41% of all possible choices could have been made to the in-group. Across all studies, of the possible 4.1 choices, approximately 3.5, or 85% of possible choices, were made in-group. In spite of the relatively high cohesion even in the fall, cohesion did increase over time (daggers represent the significance levels of pairwise t tests). Thus, it is likely that time and increased cohesion worked together to bring friends' binging levels into agreement.

In fact, at the entire group level, there was a decrease in variability on binge eating over the course of the year. The standard deviation shrank from 6.9 to 5.8 in Sorority Alpha, and from 8.2 to 7.1 in Sorority Beta (see Table 1). This difference across both sororities was significant at $p < .05$ (test of equality of variances, one-tailed).

Apparently, at both the group level (whole sorority) as well as the friendship level (within clusters), friends became more similar over time. The central question to ask at this point is, Do we have evidence here of social pressure, or is this evidence of assortative friendships (birds of a feather flock together)? Is the behavior-to-behavior correlation found in Table 3 evidence of contagion or of assortment? If sorority members were making friends on the basis of how much they binged, then a similar

pattern of within-group results would obtain in the absence of any actual social pressures or movement toward uniformity. Several converging lines of evidence suggest that this is a pattern of social influence and not merely differential assortment.

Evidence of Social Influence

First, if the phenomenon observed is merely assortment, then personality-type variables other than binge eating should also correlate among friends. This, however, does not seem to be the case; for example, self-esteem (RSE) correlates were $.01$, $.00$, and $.04$ in the spring for Alpha 1, Alpha 2, and Beta, respectively. Such problems, however, are best handled by data collected over time, and Study 2 provided us with just these sorts of data.

If binge eaters were simply reassorting to be with "birds of a feather," the social cliques uncovered in the spring (which differed significantly on binging) should have differed from each other in their past binging level as well; their fall BES scores should have been significantly different by cluster. However, in neither Sorority Alpha nor Sorority Beta were these differences significant. In fact, friendship choices were quite stable. Because friendship patterns are not continuous but nominal variables, a class measure of association, the *contingency coefficient*, was used to describe stability of friendship patterns.⁷ From fall to spring, choices were stable, with contingency coefficients of $.87$ and $.94$ in Alpha and Beta, respectively.

If the contagion coefficient were due merely to self-selection into similar groups, then one would expect this correlation to be significant in the fall. Six weeks is probably enough time to learn something about one another's eating habits; however, there is no evidence of contagion in the fall, indicating that 6 weeks was not enough time for social influence to take place.

If one allows the necessary passage of time and the increased group cohesion that accompanies it, then we would expect that pressures toward uniformity should, across the two waves, pressure women to become more like their immediate social groups. To test this, we calculated the distance a woman was from her friends at Time 1 by subtracting her binge-eating level from the average binge-eating level of her friends. This number was then correlated with how her binging level moved over the academic year. If there were social pressures toward uniform levels of binging, then the distance a woman was from her friends at Time 1 should have correlated negatively with the change in her binging level. If she binged much less than her friends, she should have increased her binging level; if she binged much more, she should have decreased.

⁶ For the Monte Carlo analyses, random data were generated with the same mean, standard deviation, and size of cliques for each sorority separately. All other calculations were made as in the actual data set. Observed correlations were in the 99th, 97th, and 99th percentile of their respective null hypothesis distributions.

⁷ The contingency coefficient is calculated as

$$C = \sqrt{\frac{x^2}{x^2 + N}},$$

where the minimum value of C is for $.00$, and the maximum value is never greater than 1.00 .

This is exactly what happened. The bottom row of Table 3 describes these correlations. In both sororities Alpha and Beta, women became more like their friends over time. The less each woman was like her friends in the fall, the more she moved toward them over the academic year. Thus, the contagion coefficient seems to be, in sum, a measure of social influence.

One possible interpretation of this finding is that it is regression toward the mean. Certainly, regression toward the mean is likely to take place. But what is the size of correlations that we would expect to find based merely on chance, and are these correlations significantly larger? To test this, a Monte Carlo study based on the same parameters, but using 325 randomly generated data sets, generated expected correlations of -.079 for Sorority Alpha and -.091 for Sorority Beta, significantly smaller than the correlations found in Table 3 (both $p < .05$, two-tailed).⁸

Festinger et al. (1950) found that in Westgate, social norms overrode personal factors, so that the potential value of the tenants organization to a person was entirely independent of his or her attitude toward it. This does not seem to be the case in the present study. Because the personal factors are essentially risk factors in the epidemiological model, standardized regressions on binge eating by risk factors were computed. Both psychological health, as measured by the RSE, and degree of fatness, as measured by the body-mass index, were independently predictive of binge eating in almost all groups at all times (see Table 4). Even as social pressures grew over the course of the year, the correlations between binge eating and the risk factors of fatness and low self-esteem remained relatively stable (no beta weights were significantly different from each other between fall and spring).

To demonstrate the simplicity of this account of the acquisition of the behavior of binge eating, Table 5 shows the regressions within each sorority of an overall regression testing the social contagion model of binge eating. Using only the RSE as a measure of general psychological well-being, the average binging level of a woman's friends, and her body-mass index, one can predict a woman's binge-eating score with a multiple correlation of .48 to .57. Although this is a fairly parsimonious account of binge eating, it nonetheless appears to be fairly useful for explaining patterns of binge eating in these sororities.

Table 4
Risk Factors for Binge Eating in Studies 1 and 2 Expressed as Standardized Beta Weights

Sorority and wave	Body-mass index	Self-esteem
Alpha Spring ₁	.28*	-.46***
Alpha Fall ₂	.41***	-.37**
Spring ₂	.42**	-.50***
Beta Fall ₂	.37***	-.37***
Spring ₂	.20	-.46***

Note. Beta weights are based on n s of 46, 51, 36, 66, and 55, for each row, respectively. Subscripts on seasons indicate either Study 1 or Study 2.

* $p < .05$. ** $p < .01$. *** $p < .005$.

Table 5
Social Influence, Body Mass, and Self-Esteem: The Social Contagion Model of Binge Eating

Study	Adjusted R	Adjusted R^2
Sorority Alpha		
Study 1	.51*	.26
Study 2	.57*	.32
Sorority Beta		
Study 2	.48*	.23

Note. Multiple correlations are based on n s of 46, 36, and 55 for each row, respectively. The regression model includes social influence, self-esteem, and the body-mass index as predictors, and are based on spring data.

* $p < .005$.

Discussion

To demonstrate social norms, popularity patterns were traced with respect to binge eating. In Sorority Alpha, deviations from the normative level of binge eating were associated with reductions in popularity. In Sorority Beta, a different normative pattern emerged; the more a woman binged, the more popular she was.

To demonstrate behavior-to-behavior influence on binge eating, sorority members' binge-eating levels were correlated with the binge-eating levels of their friends. This correlation was found in the spring for both sororities. This finding was most likely due to social influence rather than assortment, based on data including the stability of friendship ties, the lack of friend-to-friend correlation of self-esteem and other person variables, and the lack of difference among spring groups in their prior fall binging levels. Most important, however, is the correlation which directly indicates social influence: Women became more like their friends over time.

I have suggested that when a woman experiences distress, she is open to social influence. When the influence she is receiving in terms of social information and approval is in support of binging, she is more likely to become a binge eater. Some sort of interaction between social influence and susceptibility is necessary to explain the problem of binge eating. For example, there is no reason to expect that the significant negative correlations between binge eating and self-esteem reflect a fact of nature. Prior to the sociocultural development of binge eating as a symptom related to psychological distress, binge eating and self-esteem had to be uncorrelated; there was such a low incidence of problem binging prior to the early 1970s that little variability existed in binge eating (Rosenzweig & Spruill, 1986). It is only in the presence of models for and information about

⁸ The same procedure for Monte Carlo analyses was followed as before. Random data were generated with the same mean, standard deviation, and size of cliques for each sorority separately. Furthermore, the randomly generated variables representing fall and spring Binge Eating Scale scores were correlated to the same extent as the observed data. All other calculations were made as in the actual data set. Observed correlations were in the 98th and 99th percentile of their respective null hypothesis distributions.

binge eating that low self-esteem is likely to lead to binge eating. Because both of these sororities had prescriptive norms about binge eating, the appropriate social group with which to compare the self-esteem to binge-eating correlation—no backdrop of social norms—could not be included here. If it is true that an interaction between social influence and susceptibility is necessary, then individuals who are susceptible to influence (e.g., are low in self-esteem), but are not in groups where there are norms about binge eating, should not binge eat any more than average.

A Social Psychological Integration

The social influence account of binge eating provides a parsimonious bridge among the three accounts of bulimia discussed in the introduction. From the sociocultural perspective, one can discern which kinds of influence are likely to be found among social groups. Currently, one kind of influence is toward binge eating, and a college sorority is likely to reflect current concerns of this sort. From the clinical perspective, one can discern who is at risk for this social influence. In fact, many of the personality characteristics that clinicians have uncovered can be characterized as indicators of susceptibility to social influence: low self-esteem, depression, impulsivity, poor family environment, poorly developed sense of self, etc. For the epidemiological perspective, the social influence model provides a mechanism by which we can describe how symptoms are acquired and spread.

The social influence model works together with the other three approaches to meet the necessary theoretical criteria specified in the introduction. Who is and who is not at risk for binge eating is a function of both the immediate social influence and one's susceptibility to that influence. Influence and susceptibility will be affected by group cohesion, consensus on norms, and the attractiveness of the group as well as the individuals' general susceptibility to influence based on depression, self-esteem, and so forth.

The sorority milieu is likely to be a breeding ground for eating disorders (Squire, 1983); it is a powerful setting for translating cultural influence into direct social influence. The extreme social importance of body size and shape for this population most likely serves to increase the risk of beginning dieting and hence binge eating. It is likely that in other social groups where physical attractiveness and body shape are not weighed so heavily, the sorts of findings reported here would be greatly attenuated or even nonexistent.

It is important to note that a social influence model of binge eating explicitly predicts this possibility. If the group norm is entirely against dieting and binging but rather for, vegetarianism, for example, the correlation between psychological distress and binging should approach zero. Instead, the correlation between distress and vegetarianism should be high. For this reason, the size and direction of correlations should differ between groups, depending on what the norms are for handling personal distress (e.g., Garner & Garfinkel, 1980). The content portion of the social influence model (in this case, binge eating) is a relatively open slot. Distress may be handled in a number of ways, and social pressures could as easily result in smoking, delinquency, heavy drinking, loss of virginity, drug use, or depression (Jessor & Jessor, 1977; Orford, 1985). It may be in this way

that bulimia has replaced depressive symptoms as a primary pathway of expressing psychological distress among younger women. If cultural norms move away from the current overconcern with dieting and thinness, then bulimia and binge eating will disappear with them. The expression of psychological distress will continue to follow cultural norms, wherever they may wander.

These results indicate that a social psychological analysis of eating disorders is warranted and likely to bear fruit. The spread of one important symptom of bulimia—binge eating—through a population is likely to be the result of social influence. Further research in this social psychological vein is necessary to delineate the interrelationship of the variables in the model. The role and development of social norms about binge eating and their importance to friendship ties, the nature of the transfer of behavior from friend to friend, and, especially, whether and how social pressures are applied among friends, are important issues that now face us. What is necessary are longitudinal studies of women at risk for binge eating and bulimia that are begun prior to the development of disordered eating habits. This may mean beginning longitudinal studies as early as junior high school, or even before.

The question remains, what form does social influence take in these sororities? A variety of possibilities exist. It may be that the women are directly teaching each other appropriate binging levels, although several informants indicated that they felt this was unlikely. It may be a case of leadership, where the most popular women set the tone for the rest of the sorority. This would be consistent with an account based on simple imitation or modeling: The high status members' level of binging is transmitted via imitation to the rest of the group. Or members of social groups may be coerced into conforming to a clique's standard. Presumably, the coercion could be based on the giving or withholding of popularity. However, the exact process of acquisition cannot be determined in this study.

Nonetheless, these data do appear to fit the model of behavioral contagion proposed by Wheeler (1966). Wheeler, following Redl (1949), proposed that in cases where a behavior has both some sort of prior restraint to it (as excessive binge eating certainly does) and at the same time has some other strong impulse or urge toward fulfillment of a need, the presence of a model acting out the conflictual behavior increases the likelihood of the behavior being performed (Wheeler, 1966). In a sense, the avoidance gradient in an approach-avoidance conflict is lowered, making approach more likely. The social norms of the sorority, in combination with the presence of models, are likely to make the costs associated with binge eating appear less severe and increase the likelihood of higher levels of binge eating. In this way, observation of binge eating, motivated (or released) in part by social pressures based on popularity, may account for how binge eating as a behavior is acquired and expressed.

A general model of the social influence patterns in psychological distress could be derived from the social psychological model proposed here. It would involve changing the content of the social influence but not its pattern. In general, the pattern of influence is likely to follow the outline described by Kerckhoff and Back (1968) in their study of contagion in a North Carolina garment factory. Whichever symptom is being spread, it still should appear among people experiencing distress, it

should spread out along sociometric and communication networks, and the norms about the behavior should change toward acceptance as the behavior becomes more widespread. Thus, the social influence model could apply to as diverse phenomena as the hysterical fainting found in Freud's day, depression, or bulimia. All one would need to change in the model is the type of data made socially available in terms of social norms and modeling of the behavior, and one can predict fainting, rashes, vomiting, depression, or binge eating.

Indeed, the social influence processes described here look strikingly like those described by Newcomb (1943) in his famous Bennington study. A strong social norm in favor of left-wing politics emerged at Bennington College, first among the faculty, and increasingly with age, the students. New students who did not follow the norm, that is, did not espouse left-wing politics, were sanctioned with a reduction in popularity. Newcomb (1943) argued that the process of social influence and attitude change was not specific to political attitudes, but could generalize to almost any expressible attitude or set of behaviors, and these results with respect to binge eating seem to bear out his claim.

An important task remains. Peer influence may account for how behaviors such as binge eating or alcohol use begin (Orford, 1985), but an account of the sort outlined here does not describe how these behaviors can escalate into full-blown bulimia or alcoholism. Although some social factors have been studied, the role of social influence in this process as yet remains far too unexamined.

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Received October 8, 1987

Revision received April 30, 1988

Accepted May 4, 1988 ■

Split of *JCCP*—New Section on Assessment

Beginning in 1989, APA will publish the *Journal of Consulting and Clinical Psychology (JCCP)* in two sections, one focusing on the traditional domain and one concentrating on the growing area of psychological assessment. Alan E. Kazdin, the current editor, will serve as the editor for both sections in 1989. *JCCP* will continue to be published on a bimonthly basis but will contain up to 1,200 pages per year, an anticipated increase in size of over 40%. The new section, *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, will be published as a separate publication in 1989, with an additional 500 pages in four issues.

Assessment Journal—Editorial Policy Statement

Psychological Assessment: A Journal of Consulting and Clinical Psychology publishes mainly empirical papers concerning clinical assessment and evaluation. Papers that fall within the publication domain include investigations related to the development, validation, and evaluation of assessment techniques. Diverse modalities (e.g., cognitive, motoric) and methods of assessment (e.g., inventories, interviews, direct observations, psychophysiological measures) are within the domain of the journal especially as they are evaluated in clinical research or practice. Also included are assessment topics that emerge in the context of cross-cultural, ethnic, and minority issues. Case studies will occasionally be considered if they identify novel assessment techniques that permit evaluation of the nature, course, or treatment of clinical dysfunction. Nonempirical papers including highly focused reviews and methodological papers are considered if they facilitate interpretation and valuation of specific assessment techniques. Authors wishing to submit to the assessment section should send manuscripts to

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