Dieting and Eating Attitudes in Girls: Development and Prediction

BY

KLARA HALVARSSON

ABSTRACT


The aims of the present thesis were to study: 1. reported eating attitudes, dieting behavior and body image over a 1-year period among preadolescent girls (age 7-8); 2. differences in eating attitudes and coping between groups of teenage girls differing in dieting frequency, and to assess changes with increasing age (age 13-17); and 3. to what extent eating attitudes, self-esteem and coping predict disturbed eating attitudes. A final aim was to explore differences in the reported wish to be thinner, dieting, and eating attitudes between two age-matched cohorts of girls in 1995 and 1999 (7-15 years).

The project is designed as a longitudinal prospective study, spanning seven years. 1300 girls in the ages (1995) 7, 9, 11, 13 and 15 years have been assessed annually for three consecutive years (1995-1997) (Main Cohort). An additional group matched for age with the original group was recruited in 1999 (Societal Cohort). The results suggest that dieting and the wish to be thinner starts as early as at 7 years of age, and that repeated dieting attempts correlate with disturbed eating attitudes. A marked increase of the wish to be thinner was evident in the 10- to 14-year age range, and significant increases in dieting attempts occurred mainly between ages 9 and 13. There were no differences between 1995 (Main Cohort) and 1999 (Societal Cohort) (except among 7 and 11-year-olds) with regard to dieting, the wish to be thinner and disturbed eating attitudes. Eating patterns and attitudes were shown to be the strongest predictors of disturbed eating attitudes three years later. Assessment of dieting, the wish to be thinner and eating attitudes is suggested as a component in school health care.

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INTRODUCTION

In the Western world today, a lean body shape in women is associated with attractiveness, success and happiness (Smolak & Levine, 1994a). This ideal of slimness is present already among young girls during the early school years (Edlund, Hallqvist & Sjödén, 1994; Halvarsson & Sjödén, 1998; Hill, Olivers, & Rogers, 1992), and a strong desire for thinness has been linked to an increased prevalence of problematic eating behaviors (Killen, Taylor, Hayward, Wilson, Haydel, Robinson, et al., 1994; Lundholm & Littrell, 1986). The attitudes and behaviors related to these ideals and norms have caused a public health concern regarding the increase of dieting, weight concerns and clinical eating disorders (Irving, 1990; Levine & Smolak, 1996; Stice, 1994; Striegel-Moore, Silberstein & Rodin, 1986). Among female adolescents, eating disturbances and body dissatisfaction are associated with a number of other problems such as low self-esteem, poor ability to cope with stress, depression, substance use and clinical eating disorders (Leon, Fulkerson, Perry, & Cudeck, 1993).

Dieting, eating attitudes and eating disorders in women

Dieting can be associated both with healthy changes of life style, (e.g., changing to a low-fat diet or increasing physical activity) (French, Jeffery, & Forster, 1994), and with unhealthy behaviors (e.g., fasting, skipping meals, intentional vomiting, binge eating) (French & Jeffery, 1994; Serdula, Colins, Williamson, Anda, Pamuk & Byers, 1993). Dieting by restricting food-intake is a very ineffective method to achieve weight loss (Heatherton, Mahamedi, Striepe, Field, & Keel, 1997), and its health effects have been questioned (Brownell & Rodin, 1994). Studies have shown that normal as well as overweight persons engaging in chronic dieting behaviors failed to lose weight during 6- and 30-month periods respectively (Heatherton, Polivy & Herman, 1991; Klesges, Klem, Epkins, & Klesges, 1991). These studies indicate that most diets are likely to fail (Garner & Wooley, 1991). Thus, although dieting would appear to be a rational method for achieving slimness, there is little evidence in support of that notion.

A number of studies performed during the eighties and early nineties (Dykens & Gerrad, 1986; Garner, Olimsted & Garfinkel 83; Garner, Olimsted, Polivy & Garfinkel, 1984; Gralen, Levine, Smolak, & Murnen, 1990; Laessle, Tuschl, Waadt & Pirke, 1989; Rossiter, Wilson, & Goldstein, 1989; Wertheim, Paxton, Maude, Szmukler, Gibbons & Hiller 1992) have compared dieting and non-dieting women with eating disordered women. These studies
demonstrate that dieters resemble women with eating disorders with respect to their preoccupation with food, body and shape dissatisfaction, and weight. However, they do not display the same degree of general psychopathology as the women diagnosed with clinical eating disorders. Also, eating disordered women have been shown to display low assertiveness and self-esteem, more self-directed hostility (guilt, criticism) and external control as well as more psychiatric disturbances as compared to both obese and non-obese dieters and normal controls (non-dieting-non-obese) (Williams, Power, Millar, Freeman, Yellowlees, Dowds et al., 1993).

In a 10-year follow-up of a non-clinical sample of college women, Heatherton and co-workers (1997) demonstrated that body dissatisfaction, chronic dieting and eating disorder symptoms had generally diminished. These results accord with those of other research showing similar outcomes in long-time follow-ups with eating disordered patients (Collings & King, 1994; Norring & Sohlberg, 1993). However, it is important to note that many women who were initially dissatisfied with their bodies continued to engage in dieting and eating disordered behaviors ten years after the original assessment (Heatherton et al., 1997). The prevalence of full syndrome eating disorders among women ranges between 0.5 and 3% (Clarke & Palmer, 1983; Fairburn & Beglin, 1990; Patton, 1992; Schotte & Stunkard, 1987), and partial syndrome eating disorders between 3 and 5% (Button & Whitehouse, 1981; Coker & Roger, 1990; Kendler, MacLean, Neale, Kessler, Heath, & Eaves, 1991; Patton, 1992). Thus, the prevalence of partial syndrome eating disorders is higher among women than full syndrome eating disorders. The prevalence of eating disorders and eating disturbances has been reported to be higher among certain subgroups such as dancers, models, actresses and athletes (Striegel-Moore et al., 1986).

Clinical descriptions of individuals diagnosed with bulimia nervosa consistently report that binge eating began with dieting (Abraham & Beumont, 1982; Fairburn & Cooper, 1982), and those individuals who report relapse after treatment attribute the relapse to renewed dieting behaviors (Wilson, 1993). Dieting has biological, cognitive and affective consequences that may contribute to binge eating. One biological effect may be a reduced brain level of 5-hydroxytryptamine (5-HT), and it has also been suggested that patients with anorexia nervosa have reduced levels of brain serotonin (Cowan, Anderson & Fairburn, 1992; Ebert, Kaye & Gold, 1984). Cognitive mechanisms include the dieter's feeling of being vulnerable to the loss of control. A lapse in the diet is interpreted in an "all-or-nothing" manner, which in turn may
lead the individual to overeat without any attempts to control food intake (Wilson, 1993). Finally, dieting causes stress, and makes the dieter more vulnerable to the effects of stress, which in turn may serve as an antecedent for binge eating (DSM-IV: APA, 1994; Rosen, Tacy, & Howell, 1990). Thus, dieting is linked to the development and maintenance of clinical eating disorders, although their specific interrelation is still unclear (Wilson, 1993).

Adjustment and problem behaviors in childhood and adolescence

Problems such as depressive moods, somatic complaints, anxiety, and social withdrawal seem to dominate among adolescent girls. This is in contrast to problem behaviors such as conduct and antisocial problems and hyperactivity, which are more commonly seen in boys (Wångby, Bergman, & Magnusson, 1999). Girls are at increased risk for developing emotional disorders after puberty (Graham & Rutter, 1985), and research has indicated that two thirds of adolescent girls with psychiatric disorders experienced the onset before the age of 10 (Rutter, Graham, Chadwick & Yule, 1976).

Wångby and co-workers (1999) have studied the emergence of adjustment problems in girls over time (age 9 at baseline, and 13 at follow-up). Girls demonstrating shyness and timidity in late childhood displayed more conduct problems in early adolescence than remaining girls, but only a few girls had internalized multi-problems related to the self in early adolescence (Wångby et al., 1999). Girls with externalized multi-problems (involving conflict with the environment) in early adolescence had an increased risk for developing all sorts of maladjustment as adults (e.g., drug and alcohol abuse). Some of the problem behaviors (cigarette smoking, drug use and sexual activity) discussed here seem to be related to the development of eating problems in adolescent girls as well (Fisher, Schneider, Pegler & Napolitano, 1991). Among adolescents, cross-sectional studies has shown that girls with disturbed eating behaviors display more anxiety, depressive symptoms, lower self-esteem, a more negative body image and more social withdrawal than girls without these behaviors (Fabian & Thompson, 1989; Fisher et al., 1991; Richards, Casper & Larson, 1990; Rosen, Gross, & Vara, 1987). Thus, deficient psychological functioning is associated with an increased risk for eating disturbances (Shisslak et al., 1998b), eating disturbances are associated with other risk behaviors (Fisher et al., 1991), and early onset of eating disorders is associated with a poor treatment prognosis (Bryant-Waugh, Knibbs, Fosson, Kaminski & Lask, 1988). Therefore, screening for early signs of eating problems (Shisslak, Renger,
Sharpe, Crago, McKnight, Gray et al., 1999) as well as other adjustment problems is motivated before adolescence.

Terminology used in the present study
In the present study, the term eating disorders (and full syndrome eating disorders) are distinguished from concepts like partial syndrome eating disorders, disturbed eating/eating disturbances, disturbed eating attitudes, eating patterns and eating problems. The concept of eating disorders refers to those clinical disorders that are classified in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; APA, 1994). Partial syndrome eating disorders include the same behaviors as those of the full syndrome, but at a lower frequency and severity (Shisslak et al, 1998b). Disturbed eating/eating disturbances and disturbed eating attitudes are defined in terms of scores on a measure of symptoms characteristic of eating disorders [e.g., the Children’s Eating Attitudes Test (ChEAT); Maloney et al., 1989], and similar measures. Girls scoring ≥ 15 on the ChEAT will be referred to as a "high-risk" group for development of more disturbed eating attitudes. Eating patterns are defined as dimensions of eating disorders such as restrained eating, emotional eating and external eating measured by a questionnaire assessing eating disorder symptoms [Dutch Eating Behavior Questionnaire (DEBQ); van Strien et al., 1986]. Eating problems refer to attitudes and behaviors that resemble those of full- and partial syndrome eating disorders, but with lower frequency and severity.

Dieting and eating attitudes in children and adolescents
Eating disorders and weight concerns among adolescents have become an important health issue (Garner, 1993; Taylor, Sharpe, Shisslak, Bryson, Estes, Gray et al., 1998), and eating disorders occur in about 1-3% of adolescents. However, many more (5-10%) suffer from partial syndrome disorders (Shisslak, Crago, & Estes, 1995). There is general consensus that eating disorders have multifaceted pathologies (Garner, 1993), although the determinants of their etiology have yet been to be established (Fairburn & Beglin, 1990; Huon & Strong, 1998; Patton, 1988). Knowledge is still lacking about how maturational processes in young women influence the maintenance or change of eating behaviors (Heatherton et al., 1997).

Dieting behavior and the ideal of slimness as an attribute of physical attractiveness are present at an early age (Edlund et al., 1994; Halvarsson & Sjödén, 1998; Hill et al., 1992). In a study of 9-year olds, Hill and Silver (1995) demonstrated that an overweight body size is perceived
to be associated with poor social functioning, impaired academic success, bad health, unhealthy eating and low fitness. This indicates that children's views of thinness and overweight are a reflection of a widespread norm of Western societies. Concerns with thinness and dieting have been linked to an increasing prevalence of eating disorder symptoms among adolescent girls (Killen et al., 1994). A strong desire for thinness is also associated with problematic eating behaviors (Lundholm & Littrell, 1986). Cross-sectional research (Edlund, Halvarsson, Gebre-Mehdin, & Sjödén, 1999; Whitaker, Davies, Shaffer, Johnson, Abrams & Walsh, 1989) has suggested weight concerns to increase with age and body weight. Also, there seems to be an increase of restrained and emotional eating behaviors with age among adolescents (Hoare & Cosgove, 1998; van Strien et al., 1986).

Most research in the area of dieting behavior has focused on adolescent girls, despite indications that pre-pubertal girls worry about their weight and body image (Edlund, Halvarsson & Sjödén, 1996; Hill et al., 1992; Hill & Silver, 1995; Thelen, Powell, Lawrence, & Kuhnert, 1992). Also, there are reports of clinical cases of anorexia nervosa in this age range (Hawley, 1985; Jacobs & Isaacs, 1986; Warren, 1986). Documentation of dieting and eating attitudes, eating behaviors, and body image in children under the age of 12 is important in order to advance the knowledge in this area (Thelen et al., 1992). This is especially important considering that an increasing proportion of young girls (<12 years) has been found to demonstrate symptoms characteristic of anorexia nervosa, and that 5% of all patients with anorexia nervosa are under the age of 12 (Atkins & Silber, 1993). A long-term follow-up of children diagnosed with anorexia before the age of 11 suggested early onset to be associated with a poor prognosis (Bryant-Waug et al., 1988). Thus, the facts that young Western children report dieting behaviors (e.g., Edlund et al., 1994; 1996; Hill & Robinson, 1991; Hill et al., 1992; Schreiber, Robins, Striegel-Moore, Obarzanek, Morrison, & Wright, 1996), and that overweight girls are more dissatisfied with their body shape than their leaner peers (Hill, Draper, & Stack, 1994) have also been amply documented. A relationship between body weight and self-perception in 9-year old children has been reported in that the heaviest children expressed a desire for thinness, dietary restraint and low body esteem (Hill et al., 1994). However, actual body weight has been suggested to be only weakly related to the desire to lose weight (Wadden, Foster, Stunkard & Linowitz, 1989).

Research has indicated that preteen and adolescent girls are about twice as likely to have a wish to be thinner as do boys of the same age (Gustafson-Larson & Terry, 1992; Maloney et
Further, in a Swedish study, it was demonstrated that although a number of boys (age 10-16) expressed the wish to be thinner, relatively few attempted to lose weight as compared to girls in the same age groups (Edlund, et al., 1999). Also, eating disorders have been reported to be nine times more common among girls than boys (Patton, Selzer, Coffey, Carlin, & Wolfe, 1999), why it was decided to investigate girls exclusively in the present study. Although dieting is common among children and adolescents, little is known about its developmental course (Hill et al., 1994).

**Coping**

Coping refers to the various ways in which individuals evaluate and address difficult and demanding situations (Boekaerts, 1996). This phenomenon has been shown to be of importance for explaining how people deal with stressful events (Lazarus, 1982). Coping strategies are often defined dichotomously, in a state/trait perspective or viewed as a process. Dichotomous distinctions are often made between emotion-focused (management and reduction of stress) and problem-focused coping (attacking the problem that causes distress) (Lazarus, 1982); primary (modifying aspects of a situation in a manner that relieves symptoms of stress) and secondary control (allows the individual to manage unalterable situations); and between functional (efforts to manage a problem in an active manner) and dysfunctional coping (the control of feelings, mainly related to events beyond personal control) (Seiffge-Krenke, 1993). The most obvious similarities between these classifications are the components of handling distress either by actively solving the problem, or by managing the resulting emotions. The foremost proponent of a process standpoint defines coping as “ongoing cognitive and behavioral efforts to manage specific external and/or internal demands that are taxing or exceeding the resources of the person” (Lazarus, 1993, pp. 237). In that view, the terms emotion-focused and problem-focused refer to two functions of coping as a process rather than two types of coping. A state perspective on coping suggests that coping may vary, whereas a trait view regards coping strategies as relatively stable individual dispositions that pervade behavior in many situations (Lazarus, 1993). Adolescent coping behavior is often directed at multiple demands and do not need to be stressor-specific (Patterson & McCubbin, 1991). This suggests, that coping behaviors should not be classified into patterns based on discrete functions, and that any coping behavior may serve more than one function. Thus, the coping process seems to be multidimensional rather than unidimensional since one type of coping behavior could simultaneously serve more than one function. This view is compatible with state as well as trait models of coping. In view of the
sparsely available knowledge about the details of adolescent coping, it was decided not to employ a process model of coping for the present study. Instead, we have chosen a state/trait-like approach. At the same time, we avoided the simplified dichotomous classifications (by assessing a number of coping patterns rather than dichotomized classifications) that characterize much of earlier coping research by choosing this state/trait-like approach.

Children and adolescents use a wide variety of coping strategies, and they use them differently in different situations and at different ages (Compas, 1987). Research has demonstrated younger students to use more direct forms of coping (e.g., work hard) than older students who use strategies such as self-blame and tension management more (Frydenberg & Lewis, 1993). The extent to which children and adolescents show symptoms of anxiety, depression, and health complaints or become distressed after experiencing problems or negative events may at least partly depend on the quality of their coping strategies (Boekarts, 1996). It has been suggested (Patterson & McCubbin, 1991) that adolescent coping behaviors are often directed at multiple demands, and do not need to be stressor specific. Therefore, coping behaviors should not be classified into patterns based on discrete functions. Thus, the coping process seems to be multidimensional rather than unidimensional since one type of coping behavior could simultaneously serve more than one function. This view is compatible with state as well as trait models of coping.

Relatively little attention has been paid to the relations between coping and eating disorders (Fryer, Waller & Stenfert Koese, 1997), and there are contrasting results regarding the role of coping in this context. Some studies have suggested an association between eating pathology and an increased use of coping strategies like coping avoidance, catastrophizing and emotionally focused approaches (Hansel & Wittrock, 1997; Koff & Sangani, 1997; Mayhew & Edelmann, 1989; Troop, Holbrey, Trowler, & Treasure, 1994). Further, Paxton and Diggens (1997) found no differences in a non-clinical sample in the use of avoidance coping between adolescents with restrained, or binge eating and those with non-disturbed eating.

**Self-esteem**

Self-esteem concerns to what extent a person approves of, accepts and take pride in him- or herself (Harter, 1993). Self-esteem is affected by the individual's judgement of competence in certain areas of great personal value (e.g., physical attractiveness, acceptance by peers). This is particularly evident during adolescence. The development of high self-esteem requires the
experience of success within fields perceived to be important to the individual (Shisslak et al., 1998a). A parent or another significant adult is of great importance in this process, since adolescent girls and boys need role models for guidance, support, and help to build a good sense of self-esteem (Shisslak, Crago, Renger, & Clark-Wagner, 1998a). Among young school children, there appears to be small differences in self-esteem between boys and girls (Harter, 1993). As they grow older, the self-esteem seems to remain the same among boys, but drop among girls (Brown & Gilligan, 1992; Harter, 1993). Many health problems have been related to low self-esteem in adolescents (Brooks, 1992; Harter, 1993; Rutter, 1987).

There is evidence that patients with eating disorders have lower levels of self-esteem than do normal controls (Griffiths, Beumont, Giannakopoulos, Russell, Shotte, Thornton, et al., 1999; Kanakis & Thelen, 1995). Also, low self-esteem has been found to be associated with fatness-concerns in a non-clinical adolescent sample (Button, 1990). Hoare and Cosgove (1998) demonstrated among 10-16 year-old girls, that the higher the levels of restrained, emotional, and external eating, the lower the self-esteem. Furthermore, self-esteem (Wood, Waller, & Gowes, 1994) and depressive affect (Graber, Brooks-Gunn, Paikoff, & Warren, 1994) are associated with eating problems in adolescents. These results suggest that more research is needed in order to understand the role of self-esteem in the development of eating disturbances.

Risk factors related to the development of eating problems and eating disorders
Risk factors that have been suggested to be related to the etiology of eating disorders can be classified as social (e.g., sociocultural factors, family factors), psychological (e.g., self-esteem, stress and coping) and biological (e.g., genetic factors, neurobiological factors, puberty). A potent risk factor that is not easily classified is dieting, which will be discussed as a dimension of its own. Thus, both individual and sociocultural factors are stressed in discussions of the etiology of eating disorders (Levine & Smolak, 1992; Pike, 1995; Stice, 1994a).

Dieting
Dieting has been suggested to be the first hazardous step towards eating disorders (Barlow & Durand, 1995). This is of particular interest since dieting and body dissatisfaction is common enough among teenage girls to be referred to as “normative” (Polivy & Herman, 1987; Rodin, Silberstein & Striegel-Moore, 1984). Dieting behavior is related not only to the extent to
which teenagers perceive themselves to be overweight, but also whether they feel dissatisfied with different body parts (regardless of actual weight) (Graber et al., 1994; Strauss, 1999; Veron-Guidry, Williamson, & Netemeyer, 1997). Research has demonstrated that female teenagers (age 14-15) who dieted severely were 18 times more likely, and girls who dieted moderately, five times more likely to develop an eating disorder as compared to their non-dieting peers (Patton et al., 1999). Dieting is one of the core features in eating disorders. At the same time, it is a risk factor for eating disturbances. Thus, it needs to be studied as an independent as well as a dependent variable (Killen et al., 1994), especially since earlier eating characteristics is a strong predictor of later eating attitudes (Callam & Waller, 1998). Dieting practices are also considered to be one of the most important risk factors for bingeing, purging and bulimia nervosa (Fairburn, Welch, Doll, Davies, & O’Connor, 1997; Stice, Killen, Hayward, & Taylor, 1998).

**Sociocultural factors**

Research about mass media influences on the development of eating problems has indicated that greater exposure to media depicting thinness is associated with more eating disturbances (Harrison & Cantor, 1997; Levine & Smolak, 1996; Stice, Shupak-Neuberg, Shaw & Stein, 1994b; Tiggeman & Pickering, 1996; Wiseman, Gray, Mosimann & Ahrens, 1992). Further, a “global” risk factor for eating disorders is the cultural demands of "slimming" that incite young women to reduce their weight (Lunner, Wertheim, Thompson, Paxton, McDonald & Halvarsson, *in press*; Noordenbos, 1994). A culture that stimulates dieting behavior among young women may thus play an important role in the development of eating attitudes, dieting behaviors, body image and eating disorders (Noordenbos, 1994).

**Peer influence**

Peer support groups have been suggested as a means for encouraging girls to counter destructive messages and thinness aspects of the culture (Piran, 1995; 1996; Paxton, 1996; Larkin, Rice, & Russell, 1996). On the other hand, women who report that a number of their friends diet display more eating disorder symptoms than women without such peers (Crandall, 1988). Further, it has been found that teasing by peers is related both to body dissatisfaction and to restrictive eating (Cattarin & Thompson, 1994), and friendship attitudes regarding dieting and body image concerns contribute to the prediction of individual eating behaviors (Paxton, Schultz, Wertheim, & Muir, 1999). Thus, peer influences of on dieting and eating disorder symptoms can be of a risk as well as of a protective character.
Family influence

Family studies have indicated that parents try to influence their children’s eating behaviors (Striegel-Moore & Kearney-Cooke, 1994) and that they often encourage dieting (Benedikt, Wertheim, & Love, 1998; Levine, Smolak, Moodey, Shuman, & Hessen, 1994; Moreno & Thelen, 1993; Paxton, Wertheim, Gibbons, Szmukler, Hillier, & Petrovich, 1991; Pike & Rodin, 1991; Thelen & Cormier, 1995). Parents contribute to their children’s eating problems by creating an environment that emphasizes thinness, and sometimes they model weight concerns as well (Smolak, Levine & Schermer, 1999). Research has shown that mothers of dieting girls perceive their daughters to be less attractive than mothers of non-dieting girls (Hill & Franklin, 1998; Pike & Rodin, 1991). Further, associations between mothers and daughters in their motivation to diet have been proposed (Drewnowski & Yee, 1988; Hill, Weaver, & Blundell, 1990; Pike & Rodin, 1991; Ruther & Richman, 1993; Striegel-Moore & Kearney-Cooke, 1994). Also, it has been noted among 8-year-olds that their perception of whether their mother would diet if she felt fat was predictive of their own dieting behavior (Hill & Pallin, 1995). This suggests that mothers play a part in the transmission of cultural values about appearance (Hill & Franklin, 1998). Research has indicated that parents actively try to influence the child's appearance well before adolescence, and that the parents' attitudes and behaviors regarding this issue change during the early school years (Striegel-Moore & Kearney-Cooke, 1994). However, the majority of parents maintain a positive view of their children's body image and eating behaviors (Striegel-Moore & Kearney-Cooke, 1994). Perceived family conflict has also been suggested as a risk factor for dieting behaviors and eating disorders (Strober & Humphrey, 1987).

Coping

It has been hypothesized that there is an association between stress and disordered eating behaviors (Margo, 1985; Strober, 1984), and patients with eating disorders have been reported to experience a great deal of stress and to avoid dealing with this stress (Cattanach & Rodin, 1988; Koff & Sangani, 1997). Janzen, Kelly and Saklofske (1992) demonstrated a positive correlation between the use of emotion-focused coping and bulimic symptomatology in a non-clinical sample. Frequent use of both emotion-oriented and avoidance-oriented coping (attempts to avoid dealing with the stress) was associated with higher scores in eating
disorders assessment, again in a non-clinical sample (Koff & Sangani, 1997). In addition, emotion-oriented coping was found to be associated with a negative body image. Prospective research suggests that stress could be a consequence rather than a determinant of eating disorders (Rosen, Compas, & Tacy, 1993), although individuals with eating disorders have been shown to have defective coping abilities and that their disordered eating reflect these deficiencies (Caffary, 1987; Hawkins & Clement, 1984). Further, clinical studies have shown eating pathology to be associated with more use of maladaptive coping and less use of adaptive coping (Shatford & Evans, 1986; Troop et al., 1994). Fryer, Waller, and co-workers (1997) have demonstrated that emotion-focused coping is associated with disturbed eating attitudes among adolescents. There is a great need to understand stressors and coping and how adolescents are influenced by such factors (Fryer et al., 1997).

Self-esteem
Bruch (1973) suggested early that self-esteem plays a role in the etiology of eating disorders. It has been pointed out by other researchers that persons with clinical anorexia nervosa set standards so high that meeting their extreme weight loss goals may actually lead to a reduction of self-esteem, rather than an increase (Garfinkel & Garner, 1982; Johnson & Connors, 1987). Further, girls experience both a drop in self-esteem and an increase in dieting and eating problems as they become adolescents (Attie & Brooks-Gunn, 1989; Edlund et al., 1999). Further, low self-esteem/self-evaluation may serve as an antecedent for eating disorders (Fairburn et. al., 1997, Fairburn, Cooper, Doll, & Welch, 1999; Garner & Bemis, 1985).

Overweight
The prevalence of overweight in Western societies is high, both among adults and children (Gortmaker, Dietz, Sobol, & Wehler, 1987; Simpopoulos, 1986). Obesity is considered less attractive than slenderness (Blumberg & Mellis, 1980; Robinson, Bacon, & O’Reilly, 1993), but the difficulties of achieving weight loss may lead to weight preoccupation and development of eating disorders (Neumark-Sztainer, 1999). Level of obesity is considered to be a risk factor for binge eating (Cattarin & Thompson, 1994; Lunner et al., in press). In a study of a non-clinical community sample, overweight women (age 20-45) reported a higher prevalence of binge eating during the past six months than did normal weight women (French, Jeffery, Sherwood, & Neumark-Sztainer, 1999). This suggests binge eating to be almost twice as common among overweight women as among normal weight women. Further, girls (ages
9-14) with a higher BMI reported more food restriction (dieting, fasting) than their peers with a lower BMI (Childress, Brewerton, Hodges, & Jarrell, 1993). In contrast, Huon and Lim (2000) demonstrated that BMI was not related to the initiation of dieting among 13- and 14-year-olds. Thus, the relationship between overweight and eating disturbances is not clear, since there are indications that an increase in body fat or actual body weight is either not or only weakly related to dieting and the desire to lose weight (Huon & Lim, 2000; Wadden et al., 1989).

*Puberty*

A study by Hayward and co-workers (1997) has shown early maturing girls to be at a slightly increased risk for developing internalizing disorders. A number of studies have indicated early sexual maturation in girls to be associated with a disturbed body image (Alsaker, 1992; Blyth, Simmons, & Zakin, 1985; Brooks-Gunn, Petersen, & Eichorn, 1985; Brooks-Gunn & Warren, 1989; Duncan, Ritter, Dornbusch, Gross, & Carlsmithe, 1985; Simmons, Blyth, & McKinney, 1983; Tobin-Richards, Boxer & Petersen, 1983), poor achievement in school (Petersen & Crockett, 1985; Simmons & Blyth, 1987), and more general psychopathology (Petersen & Crockett, 1985). These girls also engage more in risk behaviors such as smoking, drinking and sexual activity (Magnusson, Stattin, & Allen, 1985). It has been reported that stage of sexual maturation rather than age is of importance for predicting eating disorder symptoms in adolescent girls (Hayward et al., 1992; Killen, Taylor, Hayward, Wilson, Haydel, Robinson et al., 1992). The postpubertal period may be a period of body dissatisfaction, and how girls cope with this may be critical for whether eating disturbances develop or not (Castro & Goldstein, 1995). Advanced pubertal development has thus been suggested to increase the risk of eating disturbances. However, it is important to note that the notion of whether the weight spurt associated with puberty or menarche is critical for these associations is unclear (Koff & Rierdan, 1993). Also, a study by Griffiths and McCabe (2000) showed that menarche did not predict eating disturbances among girls (ages 11-13). Thus, it may be that pubertal timing affects adolescent behavior and psychiatric risk (Hayward et al., 1997), although the role of puberty is still controversial and needs further investigation (Shisslak et al., 1998b).

*Genetic factors*

Studies have indicated that eating disorders run in the family. Relatives of patients with eating disorders are 4-5 times more likely than the general population to develop an eating disorder.
(Hudson, Pope, Jonas, & Yurgelun-Todd, 1983; Strober & Humphrey, 1987). Further, twin studies have reported a 30-50% concordance rate of eating disorders between monozygotic twins, and approximately 10% for dizygotic twins (Garfinkel & Garner, 1982; Holland, Hall, Murray, Russell, & Crisp, 1984). Thus, genetic predisposition appears to be important for the eating disorders.

**Neurobiological factors**
The hypothalamus has been suggested to be involved in the regulation of weight and eating (Barlow & Durand, 1995). Neurotransmitters suggested to play a role in the eating disorders are norepinephrine, serotonin and endogenous opioid peptides. Norepinephrine has been shown to either increase or reduce eating, depending on where it is present in the hypothalamus (Schlundt & Johnson, 1990). Contrasting findings are evident regarding the importance of serotonin in the eating disorders. There are indications that carbohydrate cravings evident in some eating disorder patients are a consequence of low serotonin, as well as the cyclic moods suggested to be a function of alternating restrictive eating and bingeing (Barlow & Durand, 1995; Wurtman, 1984). Finally, endogenous opioid peptides are released in response to starvation and may contribute to the pleasure of eating (Barlow & Durand, 1995). Thus, some neurobiological and endocrinological abnormalities do exist in the clinical eating disorders. However, these abnormalities are considered to be a consequence rather than a cause of the disorder (Barlow & Durand, 1995).

**Risk factors: Summary and conclusions**
Thus, aside from dieting behavior per se, overweight, early puberty, peer and family influences as well as general psychological functioning have been suggested as risk factors for the development of eating disorders. The health hazards associated with early (prepubertal girls) onset of dieting (e.g. retarded growth, delayed puberty) motivates the ambition to attain a clear understanding of factors related to the onset of partial as well as full-syndrome eating disorders (Shisslak et al., 1998b). Thus, it is important to focus on elementary and middle school children since these risk behaviors (e.g. dieting) seem to increase of these ages. Garner (1993) considers the eating disorders to be heterogeneous and multifactorial, stemming from the interplay of psychological, biological, familial and cultural factors.
Protective factors related to eating problems

Prospective studies are needed not only for identification of risk factors, but also to find factors that protect individuals from developing eating problems (Shisslak et al., 1995). So far, protective factors have attracted little attention in the literature in comparison to risk factors (Smolak, Levine, & Schermer, 1998). A protective factor is one that decreases the likelihood of a future outcome, and may include responses to a risk factor (e.g. coping) (O’Connor & Rutter, 1996). However, it is important to make a distinction between the absence of a risk factor and the presence of a protective factor in order to identify protective factors that can be used in primary-prevention programs (Smolak et al., 1998). Some factors identified as protective in the literature are problem-oriented coping, late puberty and peer group support.

Coping

Generally, active (problem oriented) coping strategies are associated with lower levels of anxiety and depression (Trooper et al., 1994). Some coping patterns (e.g., solving family problems, seeking spiritual support, engaging in demanding activities: “problem-focused coping”) have been suggested to have a protective effect against substance abuse (Patterson, & McCubbin, 1987). In the previously mentioned association between risk behaviors such as e.g., substance use and eating disturbances (Fisher et al., 1991), suggests that the protective effect of problem-focused coping should be explored in relation to eating disturbances as well. Problem-oriented coping has been suggested as an important component in the treatment of eating disorders as well as in preventive work (Smolak et al., 1998; Troop et al., 1994).

Self-esteem

A number of studies have shown that self-esteem plays a role in the etiology of eating disorders, and that low self-esteem is associated with more eating disturbances (Griffiths & McCabe, 2000; Shisslak, Pazada, & Crago, 1990). Therefore, high self-esteem may be considered a protective factor in relation to eating problems, and self-esteem has been suggested to be one target for primary preventive interventions (Pesa, 1999).

Family and peers

Parents seem to contribute to their daughters’ fears about being fat, body dissatisfaction and attempts to lose weight (Smolak et al., 1999). Parental input has been suggested as a factor
suitable for preventive efforts (Smolak et al., 1999), and may also be considered to have protective features.

Peer-led initiatives have been suggested to have a positive effect on adolescent health (Turner, 1999), and especially on self-esteem, self-efficacy and locus of control. Peer-led initiatives may increase self-esteem and the sense of effectiveness which in turn plays a role in determining health-related behaviors (Cooper, Shaver, & Collins, 1998). Peer initiatives also contribute to a healthy sense of self-esteem since they provide an opportunity to feel competent and successful, to develop effective coping strategies and receive social support (Greene, & Walker, 1997; Tilford, 1997). It has been found that girls in the same friendship groups display about the same BMI, level of depression and self-esteem (Paxton et al., 1999). Some friendship groups possess negative attributes characterized by high weight concern, depressed mood and low self-esteem, whereas others possess the opposite, namely low weight concern, positive mood and high self-esteem (Paxton et al., 1999). Social and psychological well-being is in turn related to healthy behaviors (Crockett & Petersen, 1993). Thus, peer support seem to be an important factor in promoting health in both adolescents and adults (Turner, 1999).

**Puberty**
Koff and Rierdan (1993) have proposed that late pubertal maturation may be a protective factor for eating disturbances, since girls who mature later tend to be leaner, lighter and taller than girls who mature early (Faust, 1977). If these girls develop negative body images as they mature, they are older at that time and have presumably already established health and eating related attitudes that help protect them against eating problems (Koff & Rierdan, 1993).

**Protective factors: Summary and conclusions**
The knowledge about protective factors is limited, and instruments for assessment of such factors are lacking (Shisslak et al., 1999). A clear understanding is badly needed of the factors that are associated with a reduction of eating problems (ranging from eating disturbances to clinical eating disorders) in young girls and adolescents, as well as the knowledge of how these factors interact. Clearly, distinguishing risk factors from factors protective against the development of eating problems in adolescents remains a difficult problem, the solution of which may hamper efforts to design primary prevention programs (Vandereycken &
Meerman, 1984). Thus, further study of precursors related to these disorders is needed (Shisslak et al., 1999).

Cross-sectional studies of dieting behaviors and eating problems
Most studies of eating disturbances have employed cross-sectional designs, comparing two or more groups with respect to eating behaviors and related variables such as personality, psychopathology or family functioning (Shisslak et al., 1995). A number of cross-sectional studies have indicated that girls with disturbed eating behaviors display more anxiety, more symptoms of depression, lower self-esteem, negative body image and more social withdrawal than girls without eating disturbances (Fabian & Thompson, 1989; Fischer et al., 1991; Richards et al., 1987).

In the late eighties, Maloney and co-workers studied dieting behaviors among American school children (Maloney et al., 1989). They reported that children who had tried to lose weight displayed more disturbed eating attitudes than children who had not tried to do so. Cross-sectional studies of dieting behaviors and disturbed eating attitudes among Swedish girls have indicated that weight loss attempts are evident from an early school age (Edlund et al., 1996; Halvarsson & Sjödén, 1998), and girls who have performed such attempts also display more disturbed eating attitudes. Two Swedish studies of girls in the ages 10 to 16 have indicated that the frequency of dieting behaviors seems to increase substantially with age (Edlund et al., 1994; 1999). In the first study (Edlund et al., 1994), the incidence of dieting among 11-year olds was 15.8% and the corresponding figure among 14-year-olds was 52.5%. In the second study (Edlund et al., 1999), 28.9% among the 10-year-olds reported weight loss attempts, and 51.3%, 49.1%, and 66.2% among the 12-, 14- and 16-year-olds did so. Our knowledge is still limited about factors that initiate and maintain dieting, as well as about its developmental course in children and adolescents (Hill et al., 1994; Huon, & Strong, 1998). Studies of longitudinal designs are required to determine the progression of dieting and disturbed eating (Shisslak et al., 1995).

Longitudinal studies of dieting behaviors and eating problems
Longitudinal studies are fairly rare due to the time and expense involved in such designs. Results from longitudinal studies spanning 1-4 years indicate that a number of dieters develop partial syndrome eating disorders, and a number of individuals with partial eating disorders progress to full syndrome eating disorders (Herzog et al., 1993; King, 1989; 1991; Patton,
1988; Patton, Johnson-Sabine, Wood, Mann, & Wakeling, 1990; Striegel-Moore et al., 1989; Yager, Landsverk, & Edelstein, 1987). Thus, it appears that some individuals considered to be at risk for eating problems progress to more serious eating disturbances over a 1-4 year time period (Drewnowski et al., 1988; Garner, Garfinkel, Rockert, & Olmsted, 1987; Hesse-Biber, 1992; LeGrange, Tibbs, & Noakes, 1994; Rathner & Messner, 1993; Thelen, Kanakis, Farmer, & Pruitt, 1993).

A 10-year prospective study has shown that eating problems in early childhood are predictive of more serious eating disturbances in adolescence (Marchi & Cohen, 1990). The presence of such problems appears to be the most important predictor for new eating disorders (Killen et al., 1994; Patton et al., 1999). Patton and co-workers (1990) have demonstrated that dieting, abnormal eating attitudes and a generalized measure of psychopathology predict the development of diagnosable eating disorders at a one-year follow-up of 15-year-old school girls. Wood and co-workers (1994) have shown that scores on eating disorders measures are predictive of the presence of partial syndrome eating disorders at a 2-year follow-up. Killen and collaborators (1994) have found that over a 3-year period, approximately 4% of a sample of adolescent girls developed symptoms reflective of eating disorders. Also, a consistent finding in a number of studies (Attie & Brooks-Gunn, 1989; Calam & Waller, 1998; Graber et al., 1994; Wood et al., 1994) is the relation between unhealthy eating attitudes and more severely disturbed eating attitudes and partial syndrome eating disorders 2-8 years later. A longitudinal study of adolescents (without bulimic symptoms at baseline) spanning four years, demonstrated the onset of at least one bulimic symptom during the study period in 10% of the sample (Stice et al., 1998). The greatest risk for onset of binge eating and purging seemed to occur at the ages 16 and 18 years, respectively (Stice et al., 1998). More research about the most hazardous periods for the onset of bulimic and other eating disorder symptoms has been called for, in order to improve the timing of further studies of etiology (Shisslak et al., 1998b; Stice et al., 1998). It should therefore be of interest to follow a number of age groups longitudinally to find out more closely at what ages one should begin measuring risk factors and when preventive efforts should be introduced.

**Development of eating problems in children and adolescents**

A prospective study by Button and co-workers (1996) has demonstrated that girls who displayed low self-esteem at ages 11-12 were at increased risk for developing eating disorders at ages 15-16. However, Calam and Waller (1998) found that psychosocial factors such as
self-esteem and perfectionism are weaker predictors of future eating disorders than are early eating characteristics. Whether low self-esteem precedes or is a consequence of eating disorders can only be determined through longitudinal studies where both types of variables are assessed at baseline and after a follow-up period (Shisslak et al., 1998a). It is still unknown whether improved self-esteem reduces the likelihood of the onset of eating disturbances, or if the explanation of the inconsistent findings regarding the role of self-esteem is that there is simply no causal link between these two variables (Shisslak et al., 1998a).

Very little is known about the role of coping strategies in the development of disordered eating behavior (Soukup et al., 1990), and even fewer studies have been conducted of the role of coping with stress in determining disordered eating in adolescents (Fryer et al., 1997). Therefore, prospective research is of interest, dealing with coping in relation to eating attitudes as potential risk- and protective factors for the development of eating disturbances.

Prospective longitudinal studies are needed not only in order to identify risk factors, but also to find protective factors. Prospective studies can also be of great value in determining who is at increased risk for developing eating problems, and what risk factors that are associated with eating problems at different ages (Shisslak, 1995).

**AIMS**

The focus of this thesis concerns patterns of eating behaviors (eating attitudes and concurrent behaviors), and the general aim is to study their changes over time, map eating behavior (screening for eating attitudes and behaviors among schoolgirls of different ages), and to identify risk and protective factors in relation to disordered eating behaviors in 7-21 year old Swedish girls.

Specific aims are:

1. To assess reported dieting behavior, eating attitudes, and body image over a 1-year period among preadolescent girls (ages 7-8) (Study I).

2. To investigate the psychometric properties of the Adolescent Coping Orientation for Problem Experiences (A-Cope) among Swedish adolescent girls in order to establish an adequate measure of coping for this group (Study II).
3. To investigate differences in eating attitudes between groups of teenage girls differing in dieting frequency, and to assess changes over time (Study III).
4. To investigate differences in coping between teenage girls differing in dieting frequency, and to assess changes over time (Study III).
5. To investigate associations between dieting frequency, eating attitudes, coping and self-esteem in teenage girls (Studies III and IV).
6. To investigate to what extent yearly assessment of eating attitudes, self-esteem and coping among teenage girls over a 3-year time period predicts the extent of disturbed eating attitudes Year 3 (Study IV).
7. To study changes in attitudes regarding the wish to be thinner and weight loss attempts over a 3-year time period among girls in the ages 7-15 (year 1) (Study V).
8. To explore differences in the reported wish to be thinner, dieting, eating attitudes, and the number of girls at a "higher risk" for eating disorders between girls aged 7-15 years in 1995 (Main Cohort) and an age-matched group of girls (age 7-15) in 1999 (Societal Cohort) (Study V).

**METHOD**

**Designs**

Study I is a follow-up study of 7-year old girls assessed twice with a one-year interval.

Studies II-V are part of an ongoing prospective longitudinal study that employs an accelerated multicohort design. The main characteristic of this design is the simultaneous assessment of at least two groups. These groups differs in age when included, which enables the study of developmental processes (Kazdin, 1998, pp. 185-187). The advantage of this design is the fact that a longer time-span can be studied in a way that requires less time than if a single age group is followed over time. Thus, children and adolescents are included in different age groups that overlap one another (e.g. one group 7 years at inclusion and another of 9), and thereafter assessed annually. This procedure lends the opportunity of studying developmental processes as well as cross-sectional differences, since e.g. the 7-year-olds will be 9 years old at a third annual assessment, and can therefore be compared to those who were 9 years old at the initial assessment. This design provides the opportunity to study within- as well as between-group differences, without having to study one group for an extended period of time (Kazdin, 1998, pp. 185-187). Data will be presented from the first year (Study II), and the first
three (Studies III, IV) and five years (Study V). Study II is based on data from the first year of the prospective longitudinal study, and Studies III and IV span 3 years. The last study (V) is based on data from the first three years (Main Cohort), as well as an additional group assessed year 5 (Societal Cohort).

The first group was recruited in 1995 and consists of girls aged 7, 9, 11, 13 and 15 years. This group will henceforth be referred to as the "Main Cohort". To reduce the risk that the data gathered from this cohort specific to the time period in which the study was conducted, an additional age-matched cohort was recruited in 1999 (Societal Cohort; Study V). Another purpose of the Societal Cohort was to minimize threats to external validity. The accelerated multicohort design enables the separation of historical period effects (effects of being studied at a certain time point) from developmental changes since each cohort has a different history, and these histories can be compared (Kazdin, 1998, pp. 185-187).

Subjects and procedures

*Study I*: *A one-year follow-up of eating behaviors and attitudes, dieting and body image in pre-adolescent girls*

Fifty 7-year old girls were included Year 1 of the study. They participated in a structured interview during regular class time, assessing attitudes to eating, dieting and body image. The same procedure was repeated one year later when 47 of the 50 girls of the original assessment participated. Analyses of variance (repeated measures) were used to compare disturbed eating attitudes between dieters and non-dieters at the two assessments. It was also used to compare data on disturbed eating attitudes and body image between the following groups: Dieter Years 1 and 2; Dieter Year 1 and Non-Dieter Year 2; Non-Dieter Year 1 and Dieter Year 2; and Non-Dieter Years 1 and 2.

*Studies II-V*

These studies are part of a prospective longitudinal study of risk and protective factors related to the development of eating disorders in girls, spanning 7 years. The overall purpose is to identify patterns of eating behaviors, study their changes over time, to map eating behaviors in relation to maturation, and to identify risk and protective factors in relation to disordered eating behaviors in 7-22 year old Swedish girls. The present study is based on data from Year 1 (1995) (Study II), Years 1-3 (1995-1997) (Studies III and IV), and Years 1-3 (1995-1997) and an additional cohort Year 5 (1999) (Study V).
Subjects are Swedish girls in five age groups: 7, 9, 11, 13 and 15 Year 1 of the study (1995) (Main Cohort). The sample was achieved by stratified randomized selection based on all school classes in Uppsala county (central Sweden, pop. 289,062). Uppsala county was first divided into six sub-areas in order to represent the city, urban communities and the countryside. The purpose of this procedure was to achieve a random sample of girls that would match Uppsala county as closely as possible, in order to enhance external validity. Out of the 97 schools (N=7, 330), 38 schools were randomly chosen. Recruitment was terminated when the number of girls who had accepted the invitation had reached at least 250 per age group. Year 1 (1995), 2197 girls were invited, 1011 (46%) accepted the invitation, and 413 (19%) declined participation, and 769 (35%) did not reply to the invitation. Two-hundred and sixty-eight additional girls (12%) were included after delayed consent (decision to participate on the day of the data collection), resulting in a total number of participants of 1279 (58%) Year 1. In Year 2 (1996), all girls previously participating, were invited again. One-thousand and eleven girls (79%) accepted the invitation, 128 (10%) declined, and 141 (11%) did not reply. An additional 65 girls were included who had not replied to the invitation in time, resulting in a total of 1076 participants (84%) Year 2 (1996). The same procedure for inviting participants was used Year 3 (1997), 909 (71%) accepted the invitation, 93 (7%) girls declined the invitation and 288 (22%) never replied. A total of 1085 (85%) girls participated.

All the school principals were sent a written invitation for their school to participate. When the principal had been informed about the purpose and procedure of the study, and had approved participation, separate invitations were sent to the girls, their parents, teachers and school nurses. These letters included information about the purpose and procedure of the study, and that all answers were to be treated confidentially. Informed consent was required in order for the girls to participate. Girls in Grades below 4 participated in an individual structured interview (also used with a few older girls with reading and writing difficulties) conducted by one of the research staff (regular class time). Girls in Grade 4 and above completed questionnaires during regular class time supervised by the research staff. The participants were informed about the longitudinal design of the study, and that they would receive new invitations each year. After the girls had completed the assessment, they were asked to bring an envelope with questionnaires home to their parents, who were asked to mail the forms back to the staff after completing them. The teachers received forms after the assessments of the girls had been performed. Height and weight were registered on a separate
occasion by the school nurse at the assessments Years 1 (1995), 2 (1996) and 5 (1999); and by self-report Year 3 (1997). Prior to the first data collection, the project staff met with all the teachers involved to make sure that they had proper information about the study. All the staff involved in the project received training in interviewing as well as in the procedure of classroom assessment (how to explain the purpose and procedure of the study as well as how to respond to the students’ questions).

In order to explore the extent to which reported dieting behavior and eating attitudes among girls 7-15 years of age in 1995 were replicated in 1999, an additional group (Societal Cohort) matched for age with the Main Cohort was recruited Year 5. A total of 3929 girls were invited (mainly from the same schools as the Main Cohort), and 1279 (33%) accepted the invitation and 648 (17%) declined, leaving 1759 (45%) participants.

**Study II: Development of a Swedish version of the Adolescent Coping Orientation for Problem Experiences**

Data from girls ages 13 and 15 Year 1 (1995) (n=590) of the prospective longitudinal study were used to analyze the psychometric properties of the Adolescent Coping Orientation for Problem Experiences (A-Cope). This is an instrument designed to identify behaviors that adolescents find helpful in managing problems or difficult situations (Patterson & McCubbin, 1991). Patterson and McCubbin (1991) have offered evidence that the A-Cope is a valid and reliable instrument for assessing adolescent coping behavior. The original version of the A-Cope consists of 54 items forming 12 subscales.

Principal component factor analysis was performed (orthogonal rotation), first for the whole sample, and then separately in two groups (the sample split in two halves) in order to investigate the replicability of the obtained factor structure. The intercorrelations between the factors were generally low. Cronbach alphas were computed to estimate internal consistency of demonstrated factors. Analysis of the factor structure (principal component analysis) and internal consistency (Cronbach’s α) of the subscales of the original A-Cope revealed inadequate psychometric features. Therefore, a Swedish version of the A-Cope was developed (A-Cope-S).
Studies III and IV: Dieting behavior, eating attitudes, coping and self-esteem among adolescent girls over three years

Data from the teenage girls (ages 13 and 15 Year 1) who participated the first three years (1995-1997) of the 7-year longitudinal study (n=378) were analyzed.

In Study III, differences in eating attitudes and coping between groups differing in dieting frequency were monitored over a three-year time period. Girls reporting current dieting behaviors at all 3 assessments were classified as Frequent Dieters, current dieters at 1 or 2 assessments were classified as Intermittent Dieters, and those who did not report dieting behaviors, as Non Dieters. This variable will be termed dieting frequency. This procedure is in accordance with a suggestion by French, Perry, Leon and Fulkerson (1995b). Analyses of variance (repeated measures) were performed of Dieting frequency by Time designs, and the Tukey HSD-test for post hoc comparisons of unequal samples was employed for pairwise between-group comparisons. Bivariate correlations as well as polynomial regression analyses were used to explore associations between eating attitudes and coping within and between years of observation.

Study IV was based on the same data as Study III, but focused on the prediction of disturbed eating attitudes Year 3 on the basis of eating-related (e.g., restrained and emotional eating behaviors) and psychological variables (coping, self-esteem). Bivariate correlations were first computed between the predictor variables at all assessments and disturbed eating attitudes scores Year 3. Predictors showing statistically significant correlations were entered simultaneously in a standard multiple regression analysis. The dependent variable was disturbed eating attitudes Year 3, and the predictor variables were disturbed eating attitudes Years 1 and 2, and eating patterns, coping, and self-esteem at all three assessments. An additional multiple regression analysis was performed with the eating patterns and attitudes variables excluded in order to explore the exclusive contribution to the prediction of disturbed eating attitudes Year 3 by the psychological variables (self-esteem and coping). Assessment of multicollinearity was performed by computation of bivariate correlations between the independent variables.
Study V: A longitudinal study of the development of dieting among 7-17 year-olds Swedish girls

Data from were used the first three years (1995-1997; Main Cohort) and an additional group recruited in 1999 (Societal Cohort) in the prospective longitudinal study. The purpose was to study changes in the wish to be thinner, and dieting behavior over three years (Main Cohort), as well as to compare the Main Cohort with the Societal Cohort with respect to the wish to be thinner, dieting behavior and disturbed eating attitudes. The participants were 7, 9, 11, 13 and 15 years old Year 1, 1995 (Main Cohort), and the Societal Cohort (1999) was matched for age with the Main Cohort Year 1. The Cochran Q-test (for overall differences), and the McNemar change test (McNemar, 1969) (for within-group between-assessment differences) were employed to explore within-group changes over time in each age groups. T-tests were used to investigate differences between dieters and non-dieters with respect to ChEAT scores in the Main Cohort Year 1(1995) and in the Societal Cohort (1999). Chi-square analysis was employed to explore differences in dieting frequency and the wish to be thinner and the number of girls scoring ≥15 on the ChEAT ("high-risk" group) between the Main Cohort and the Societal Cohort. In order to test for differences in eating attitudes between girls dropping out and those remaining in the study, t-tests were performed of ChEAT scores in the Main Cohort Year 1.

Instruments

*The Children's Eating Attitudes Test (ChEAT) (Studies I, III, IV, V)*

A Swedish version (Edlund et al., 1994) of the Children's Eating Attitudes Test (ChEAT; Maloney et al., 1989) was used to assess attitudes and behaviors associated with eating disorders. The ChEAT is a 26-item instrument in which each item is rated on a 6-point Likert scale from 1 ("never") to 6 ("always"). The most eating disordered-symptomatic response is scored 3, the adjacent response 2, and the next response 1. The remaining responses are scored 0. ChEAT scores above 20 have been suggested to be a cut-off for developing clinical eating disorders (Garfinkel & Garner, 1982). This procedure is in accordance with Garner and Garfinkel (1979). The ChEAT has been reported to have adequate reliability and validity (Smolak & Levine, 1994). Data will be presented in terms of these values referred to as ChEAT-scores (Garner & Garfinkel, 1979). Items 19 (Edlund et al., 1999; Maloney et al., 1988; Smolak & Levine, 1994b) and 25 (Smolak & Levine, 1994b) have been reported to have low item-total correlations, and were excluded. As a consequence, a new cut-off score of ≥15 ("high-risk group") was employed in the present study.
Demographic and Dieting Questionnaire (Studies, I, III, V)

A demographic and dieting questionnaire (Edlund, et al., 1994) was used to assess dieting, dieting habits in the family, body shape, physical activity and eating habits. The questions "Have you ever tried to lose weight" (Study I) and "Are you trying to lose weight today?" (Studies III and V) were used to distinguish dieters from non-dieters (affirmative/non-affirmative responses, respectively).

The Dutch Eating Behavior Questionnaire (DEBQ)(Study IV).

We employed a Swedish version (Halvarsson & Sjödén, 1998) of the Dutch Eating Behavior Questionnaire (DEBQ; van Strien, et al., 1986), modified for children. The DEBQ contains 33 items forming 3 subscales: “Restrained eating” (10 items), “Emotional eating” (13 items) and “External eating” (10 items). Higher scores mean that a behavior or attitude is more frequent. The Swedish version has been demonstrated to have adequate psychometric properties (Halvarsson & Sjödén, 1998).

Maus' Body Silhouettes (Study I)

An instrument assessing body image was employed (Maus, Pudel, & Westenhöfer, 1987). It consists of five body silhouettes ranging from very thin (1) to obese (5). The girls were asked to estimate their current shape and their ideal shape.

Adolescent Coping Orientation for Problem Experiences- Swedish version

(A-Cope-S)(Studies II, III, IV)

A Swedish version of the Adolescent Coping Orientation for Problem Experiences (Patterson & McCubbin, 1991) [A-Cope-Swedish version (S)] was employed (permission by original authors). A-Cope-S is an inventory designed to identify behaviors adolescents use in order to manage problems or difficult situations. The original version (A-Cope) consists of 54 items forming 12 subscales (Ventilating Feelings, Seeking Diversions, Developing Self-reliance, Developing Social Support, Solving Family Problems, Avoiding Problems, Seeking Spiritual Support, Investing in Close Friends, Seeking Professional Support, Engaging in Demanding Activity, Being Humorous, Relaxing) (Patterson & McCubbin 1991). The scores range from 1 to 5 (“never”- “most of the time”) on a Likert-type scale where 5 indicates the most frequent use of a coping strategy. Reversed scoring is used for eight items (nine items in the original version) that concern coping strategies normatively evaluated as undesirable, e.g., smoking,
drinking (Patterson & McCubbin, 1991). A high score indicates less frequent use of the strategy described in these items. Higher scores are thus indicative of more frequent use of adaptive coping (or less use of maladaptive coping for the reversed items). Patterson and McCubbin (1991) have reported a reasonable factor structure with factor loadings ranging between .50 and .75.

Self-esteem instrument "I Think I Am" (Study IV)
Self-esteem was assessed by the questionnaire “I think I am” (Ouvinen-Birgerstam, 1985), which consists of items derived from a number of well-established instruments for the assessment of self-esteem (Ouvinen-Birgerstam, 1985). Higher scores indicate better self-esteem. It includes 72 items that are divided into 5 subscales: Physical traits, Skills and abilities, Psychological well-being, Relation to family and Relation to others. Adequate subscale-total correlations and split-half reliability have been demonstrated (Ouvinen-Birgerstam, 1985).

Table 1. Instruments used in Studies I-V.

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Data analyses and statistical methods
Statistical methods are described in detail in each of the studies. Comparisons between groups over assessments [e.g., Dieters/Non-Dieters (Study I) and Frequent Dieters/Intermittent Dieters/Non Dieters (Study III)] with regard to disturbed eating attitudes (Studies I and III), body image (Study I), body weight (Study I), and coping (Study III) were performed with repeated measures analyses of variance. For post hoc comparisons, the Tukey HSD-test for unequal samples (Study III) and the Scheffé-test (Study I) were employed for pair-wise
between-group comparisons. The Cochran Q-test (Study V) was used to assess within-group changes in current dieting and the current wish to be thinner over time (Years 1-3; 1995-1997). Each age group was tested separately. Chi-square analysis (Study V) was employed to assess between-group differences in the prevalence of current dieting between Year 1 (1995) and Year 3 (1997), in current wish to be thinner between Year 1 (1995) and Year 3 (1997), and in the size of the "high-risk" group (≥ 15 on the ChEAT) between 1995 (Main Cohort) and 1999 (Societal Cohort). Two-tailed t-tests were employed to assess differences in disturbed eating attitudes between age groups Year 1 (1995) and 5 (1999) (Study V).

Associations between two variables were calculated either by simple bivariate correlations (Studies III-IV) or polynomial regression analyses (Study III). Standard multiple regression analyses with simultaneous entry was used for the prediction of disturbed eating attitudes Year 3 (1997) (Study IV). Principal component factor analysis (orthogonal rotation) was performed in order to assess the psychometric properties of the A-Cope (Study II). An analysis was first conducted for the whole sample, and then separately after splitting the sample in two halves, in order to investigate the replicability of the obtained factor structure. Cronbach alphas (Study II) were computed to estimate internal consistency of demonstrated factors.

RESULTS

Summaries of Studies I-V

Study I: A one-year follow-up of eating behaviors and attitudes, dieting and body image in pre-adolescent girls

Fifty 7-year-old girls were assessed two years in a row in order to explore changes over time in weight loss attempts, the wish to be thinner, eating attitudes and body image. The aim was to study the development of these behaviors and attitudes over a one-year follow-up period. The results showed that 11% reported weight loss attempts at both assessments, and 15% changed from being non-dieters to dieters at the second assessment. Fifty percent of the girls who agreed that they had “ever tried to lose weight” at the first assessment, reported that they had never tried to do so the second year. Thus, the determination of dieter/non-dieter status among 7-year-olds is very unreliable.

Overall, disturbed eating attitudes (Children’s Eating Attitudes Test: ChEAT) increased over time regardless of reported weight loss attempts. Girls who reported weight loss attempts at both assessments displayed the most disturbed eating attitudes, followed by those who
changed from being non-dieters to dieters. This indicates that more disturbed eating attitudes are associated with dieting behavior. Thus, although dieting behavior as reflected by a single question in 7-8-year-olds is unstable over time, repeated assessments may have better discriminant validity, since the measure of disturbed eating attitudes corresponds well with changes in reported dieting attempts.

The results indicate that repeated dieting attempts reported by young children are accompanied by elevated scores on an eating attitudes measure (ChEAT). There were no significant differences with regard to body image. Thus, some children in this age range appear to be aware of the cultural demands of Western society, and engage in restrictive eating behaviors. This study confirms previous research demonstrating that children report eating problems at an early age.

Study II: Development of a Swedish version of the Adolescent Coping Orientation for Problem Experiences

The objective was to investigate the psychometric properties of the Adolescent Orientation for Problem Experiences (A-Cope) among Swedish adolescent girls. A sample of 590 13- and 15-year old girls participated. Data are based on the first year of the 7-year longitudinal study.

The results (principal component factor analyses, orthogonal rotation) indicated that the original version of the A-Cope failed to demonstrate an adequate factor structure in this sample. Factor analysis of the total group resulted in a solution containing 16 factors, accounting for 60.6% of the variance. This factor structure contrasts with the of the 12-subscale structure original A-Cope. Most factors in the present analysis contain items from several of the original A-Cope subscales. In addition, several items did not load on the same factors as in the original A-Cope. A problem in the present analysis was that some of the factors were based on only a few items (<3). Therefore, it was decided to attempt to form a novel version of the instrument where a restriction was adopted that each factor should contain at least 3 items. Application of this criterion yielded 8 factors with 35 items loading ≥ .40. In order to cross-validate these findings, the sample was divided in two halves, and separate analyses were conducted for each group. The results showed that the majority of the items belonged to the same factors as in the analyses of the entire sample, leaving an 8-factor solution for the construction of new subscales. Thus, the analysis of the total sample resulted in 35 items forming 8 subscales ("Distractions" “Acting Out”, “Social Support”, "Problem
Reliability of the novel subscales was examined in terms of homogeneity (Cronbach α-coefficients). Six of the 8 subscales demonstrated moderate to acceptable α-coefficients (≥ .60). The remaining two subscales failed to demonstrate an acceptable internal consistency (Spiritual and School Support, α=.51; and Diversions α=.06) and were therefore excluded.

Based on these above mentioned results, a 28-item, 6-subscale instrument was developed, and in an additional factor analysis, all items except one had sufficiently high loadings on the same factors as in the 8-factor solution based on the whole sample. This final version was termed A-Cope-S (swedish version), and consists of the following six subscales: Distractions, Acting Out, Social Support, Problem Solving, Avoidance, and Take Light. The findings suggest that the A-Cope-S is suitable for the study of coping among Swedish adolescent girls.

**Study III: Dieting, eating attitudes and coping among Swedish adolescent girls: Changes over 3 years.**

The aim was to study changes in dieting, eating attitudes and coping over a three-year-period (1995-1997) among Swedish adolescent girls. Three-hundred and seventy-eight girls participated at all three yearly assessments. The results showed that 32.5% reported that they were currently trying to lose weight (dieting behavior) the first year of assessment (Year 1, 1995). This number increased slightly over the three-year-period (Year 2, 1996: 35.3%; and Year 3, 1997: 36.5%). Girls reporting dieting behaviors at all 3 assessments were categorized as Frequent Dieters, dieters at 1 or 2 assessments, Intermittent Dieters, and those who did not report dieting behaviors, Non Dieters. This categorization was termed dieting frequency.

The results showed that teenage girls who reported Frequent Dieting also displayed significantly more disturbed eating attitudes (ChEAT) than both Intermittent and Non-Dieters. Also, intermittent dieters demonstrated more disturbed eating attitudes than girls who did not try to lose weight during the study period. These differences were roughly stable over the three-year period. Thus, there seems to be no increase of disturbed eating attitudes (ChEAT) between ages 13 and 17 in any of the groups. There were no between-group differences with respect to coping (A-Cope-S).

Among the Intermittent and Non-Dieters, higher disturbed eating scores were accompanied by higher Avoidance coping scores (bivariate correlations). It should be noted that several of the
Avoidance items concern behaviors that may serve a coping function, but which may also be considered problem behaviors in their own right (e.g. smoke, consume alcoholic beverages, stay away from home). Among the Frequent Dieters, significant inverted U-shaped associations (polynomial regression analysis) suggest that the highest levels of Avoidance are accompanied by no more disturbed eating attitudes than low Avoidance scores. There is no ready explanation of this finding.

**Study IV: Prediction of disturbed eating attitudes in adolescent girls: A 3-year prospective longitudinal study of eating patterns, self-esteem and coping.**

The purpose was to examine the extent to which yearly assessments of eating patterns and attitudes, self-esteem and coping strategies over a 3-year period among adolescent girls predicted the degree of disturbed eating attitudes at the Year-3 assessment. Three-hundred and seventy-eight girls participated at all three yearly assessments.

The results of a bivariate correlational analysis showed substantial associations mainly with the eating-related (attitudes and patterns) variables (ChEAT-scores Years 1 and 2; Dutch Eating Behavior Questionnaire: DEBQ: Restrained and to some extent Emotional Eating Years 1-3), but also with overall self-esteem (I Think I am) (Years 1-3). Coping by using Social Support and Avoidance Year 1 was negatively correlated with disturbed eating attitudes (ChEAT) Year 3, and so was Acting Out, Avoidance and Take Light Year 3. Distractions Year 3 was positively correlated with concurrent scores of disturbed eating attitudes (ChEAT). Thus, more use of problem behaviors (e.g., stay away from home, smoke, get angry and yell at people) and distractions (eat food, go shopping, take prescribed drugs) was related to more disturbed eating attitudes (ChEAT) Year 3. Further, less use of social support (e.g., do things with the family, talk with mother or father), and lower self-esteem were also associated with more disturbed eating attitudes (ChEAT) Year 3.

The entered set of variables explained 75% of the total variance in disturbed eating attitudes (ChEAT) Year 3. The results showed that the disturbed eating attitudes (ChEAT) Year 3 were significantly predicted by disturbed eating attitudes (ChEAT) Year 2, the eating pattern (DEBQ) restrained eating Years 1 (negative) and 3, as well as the eating pattern emotional eating Years 2 (negative) and 3. Among the psychological variables, coping (A-Cope-S) by taking light Year 3 (negative), and self-esteem Year 1 (negative) were the only significant contributors to the prediction of disturbed eating attitudes (ChEAT) Year 3. Thus, disturbed
eating attitudes (ChEAT) Year 2 contributed most to the prediction of disturbed eating attitudes (ChEAT) Year 3, followed by the eating pattern (DEBQ) restrained eating Years 1 and 3. The contributions of the remaining variables were insubstantial.

In order to explore the exclusive impact of the psychological variables, we ran an additional analysis without the eating-related (attitudes and patterns) variables. Thus, the psychological variables (coping and self-esteem) that showed significant bivariate correlations with disturbed eating attitudes (ChEAT) Year 3 were entered into a standard multiple regression analysis. Disturbed eating attitudes (ChEAT) Year 3 were significantly predicted by coping (A-Cope-S) by using distractions Year 3, taking things light Year 3 and self-esteem Year 2. More disturbed eating attitudes (ChEAT) were thus related to more use of distraction, less use of take light and lower self-esteem. These results indicate the limited predictive value of these psychological variables even when all eating related variables were excluded. Furthermore, there was no support for the notion that the eating-related variables mediated the effect of self-esteem.

Additional multiple regression analyses were conducted in order to find out what combination of variables accounts for the shared variance between self-esteem and disturbed eating attitudes (ChEAT) Year 3. This yielded a significant model where Self-Esteem Years 1 and 2 contributed significantly to the prediction of ChEAT scores Year 3.

Based on the present study, it seems like earlier eating patterns and attitudes is a potentially important predictor for the development of more serious eating disturbances among adolescent girls.

**Study V: A longitudinal study of the development of dieting among 7-17 year-old Swedish girls**

The aims of Study V were to explore changes in the wish to be thinner and weight loss attempts for three consecutive years among five age groups (7, 9, 11, 13, 15 years of age 1995, Main Cohort). Also, an age-matched cross-sectional sample (Societal Cohort) was included in 1999 in order to explore potential differences between 1995 and 1999 in the groups of 7-15 year-old girls. Thus, the intention was to investigate the extent to which attitudes to eating and dieting had changed in these age groups over a four-year period.
In the Main Cohort, there were significant overall increases (Cochran Q-test) over time in all age groups except the 7-year-olds with respect to the number of girls expressing a current wish to be thinner. For all remaining groups, the McNemar Change test revealed significant increases between Years 1 (1995) and 3 (1997) (age 9 to 11, 11 to 13, 13 to 15, and 15 to 17). Among the 13-year-olds, there was an increase also between Years 1 (1995) and 2 (1996) (13 to 14). Further, there were significant increases for the 9-, 11-, and 15-year-olds between Years 2 (1996) and 3 (1997) (age 10 to 11, 12 to 13, and 16 to 17). Chi-square analyses showed that 9-year-old girls Year 1 (1995) did not differ significantly from those who became 9 years Year 3 (1997). Neither were there any such differences in the remaining age groups (11, 13, and 15 years). Thus, the experience of participating in the study for two years did not influence scores significantly. In sum, these results indicate an increasing trend in the wish to be thinner between the ages 9 and 17, and especially in the 10- to 14-year age range.

The number of current dieters increased with increasing age among the 9- and 11-year-olds only. For the 9-year olds, significant increases were evident between Years 1 and 3 (age 9 to 11) and between Years 2 and 3 (age 10 to 11). For the 11-year-olds, there was a significant increase between Years 2 and 3 only (age 12 to 13). There were no significant differences between 9-, 11-, and 13-year-old girls Year 1 (1995) and those who turned 9, 11, and 13 years old Year 3 (1997). Thus, significant increases in dieting attempts seem to occur mainly between the ages 9 and 13, although there was a 7% (non-significant) increase between 13 and 15 years among those who were 13-years old Year 1.

Comparisons were made between the Main Cohort (1995) and the Societal Cohort (1999) with respect to the wish to be thinner and current dieting. There were no significant overall differences regarding the wish to be thinner. Among the 7-year-olds, significantly more girls in the Main Cohort stated that they had a current wish to be thinner than in the Societal Cohort. There was no significant overall difference regarding current dieting behavior (Main Cohort Year 1 vs. Societal Cohort Year 5), nor were there any differences in any of the age groups. There were two significant differences (t-test and chi-square analysis) between the two cohorts with respect to disturbed eating attitudes (ChEAT). First, 11-year-olds in the Societal Cohort (1999) had more disturbed eating attitudes than the 11-year-olds in the Main Cohort (1995). Second, there was a 4.6% reduction of girls scoring ≥15 on the ChEAT ("high-risk" group) among the 7-year-olds in 1999 as compared to 1995.
DISCUSSION

General discussion

Dieting behaviors

The prevalence of dieting seems to increase most between the ages of 9 and 13, and thereafter, a fairly stable level was noted. The results indicate no differences in self-reported dieting between 7-15-year old girls in 1995 and an age-matched cohort in 1999.

These results confirm previous research (e.g., Edlund et al., 1994; Halvarsson & Sjödén, 1998; Hill et al., 1992; Maloney et al., 1989) demonstrating that children report weight loss attempts at an early age (Studies I and V). There was an increase in dieting behavior between the ages 7 and 8 (Studies I). This may be an effect of unreliable reports of dieting in this age group. The frequency of dieting behavior reported by the 7-year-olds was about the same in 1995 (5.5%; Main Cohort) and 1999 (6.5%; Societal Cohort), but was higher in the 1993 study (21%; Study I). The higher incidence of dieting in Study I (1993) may be attributed to the fact that participants were asked the question "have you ever tried to lose weight?" and not "are you trying to lose weight today?", which was used in Study V. Since the formulation "ever tried" covers a longer time period, reported figures should logically be higher. However, this presupposes that the 7-year-olds in Study I had attempted dieting at an even younger age. To our knowledge, no studies seem to have been performed of girls younger than 7 years, why this notion remains to be validated. The similarity between the dieting data in 1995 and 1999 indicates that the assessment of current dieting is more reliable than retrospective reports in this age group.

Among the 9-year-olds (Study V), there was a significant increase in reported dieting behavior between the ages 9 and 11 (10.1%-15.5%, Years 1 and 3), as well as ages 10 and 11 (8.9% and 15.5%, Years 2 and 3). It should be noted that there was no significant difference in dieting between 9-year-olds Year 1 (1995) and 9-year-olds Year 3 (1997) nor did the 9-year-olds in 1999 (Societal Cohort, 7.4%) differ from the 9-year-olds Year 1 in the Main Cohort (1995). These numbers are substantially lower than those previously reported in a Swedish cross-sectional study of 9-year-olds in 1994 (28.3%; Halvarsson & Sjödén, 1998). The latter group was asked if they had ever tried to lose weight as opposed to current dieting behaviors, which may explain the higher value. These results as well as those for the 7-year-olds suggest that longitudinal assessment of younger children is to be preferred to single assessments.
Among the 11-year-olds (Study V), reported dieting behavior increased significantly between the ages 11 and 13 (22.2% and 31.0%, Years 1 and 3). Again, the prevalence of dieting in 1995 (22.2%, Main Cohort) corresponds well with the observations in 1999 (Societal Cohort), where 22.4% of the 11-year-olds reported current dieting. There was no evidence to suggest that participation in the project for two years had affected the results, since there were no significant differences between 11-year-olds Year 1 (1995) and Year 3 (1997). For the 11-year-olds, the numbers of dieters is fairly similar to results from a previous Swedish cross-sectional study, using the "ever dietied" question (Edlund et al., 1994). Studies of Israeli (Sasson, Lewin & Roth, 1995) and U.S. (Maloney et al., 1989) children in Grades 3-6, have shown that 34% and 37%, respectively, reported that they had ever tried to lose weight. These numbers parallel the results from the Main Cohort, but are higher than the Societal Cohort (27%). Overall, the results reported by Maloney and co-workers (1989) and Sasson and co-workers (1995) correspond better with the Swedish cross-sectional studies (Edlund et al., 1994; 1996; 1999) using the “ever dieted” question.

There were no significant increases of dieting with increasing age among the 13-year-olds (Years 1-3, 1995-1997), and no difference between 13-year-olds Year 1 (1995) and Year 3 (1997). The 13-year-olds assessed in the present study deviated in dieting behavior (30-37%, Years 1995-1997) from reports on 12- and 14-year-olds in earlier cross-sectional assessments where 49.1-53.3% reported that they had ever tried to lose weight (Edlund et al., 1994; 1999).

There were no significant changes in dieting behavior with increasing age among the 15-year-olds (Year 1, 1995), but a stable pattern from age 15 to 17 (Years 1-3, 1995-1997), the level ranging between 34 and 37%. These numbers accord with data on the prevalence of dieting among the 15-year-olds Year 3 (1997). This is a contrast to previous cross-sectional studies (Edlund et al., 1994; 1999) where 49-66% of 14- and 16-year-olds reported that they had ever tried to lose weight. Thus, the prevalence of dieting behavior seem to depend partly on the formulation of the dieting question. In studies using the “ever dieted” question, higher numbers of dieters are reported than in the present longitudinal study asking about current dieting.

The longitudinal study including the Main Cohort and the Societal Cohort is based on a sample that is most likely more representative of the population of 7-15 year old girls than are
the samples in the previous cross-sectional studies (Edlund et al., 1994; 1996; 1999; Halvarsson & Sjödén, 1998). The samples in the cross-sectional studies were recruited from a Swedish university town, selected to represent the city and the countryside (Edlund et al., 1994; 1999) and to represent a variety of housing standards (Edlund et al., 1996; Halvarsson & Sjödén, 1998). The selection of these samples deviates from that of the present studies (Study II-V) where the sample was recruited by stratified random selection from a population based on a county as opposed to a city. The sample sizes of the cross-sectional studies (Edlund et al., 1994; 1996; 1999; Halvarsson & Sjödén, 1998) were also smaller than the ones assessed in the present studies (Studies II-V). Thus, considering the procedure of sample selection and the sample size, the results presented in Study V seem to be more reliable than those previously reported in cross-sectional studies (Edlund et al., 1994; 1996; 1999; Halvarsson & Sjödén, 1998). Dieting behavior should be assessed as a currently occurring phenomenon rather than by retrospective reports. This is important especially among the younger children who need to be observed over an extended period of time, since retrospective reports of dieting appear to be highly unreliable in this age group.

International studies assessing dieting behavior by a single question have asked about trying to lose weight in the past year (yes/no). Reported prevalence of dieting ranged between 13% and 41% among adolescent girls (French et al. 1995a; 1995b; 1997). Between 13% and 24% (depending on race) stated that they had tried to lose weight more than five times in the past year (French et al., 1997), and 29% had tried to lose weight three years in a row (assessed annually). Further, 35% had tried to lose weight on one or two out of three annual assessments, and 35% were non-dieters (never tried to lose weight) These numbers roughly parallel the findings of Studies III and V suggesting that assessment of dieting based on a single question to be fairly reliable, provided the question concerns short-time recall rather than whether a person has ever dieted.

The wish to be thinner

The number of girls expressing a wish to be thinner increased significantly with increasing age (1995-1997) in all age groups except the 7-year-olds (Main Cohort) (Study V). More specifically, there were increases between Years 1 and 3, corresponding to ages 9 to 11, 11 to 13, 13 to 15 and 15 to 17. Further, 9-years-olds Year 1 (1995) did not differ significantly from those who became 9 years Year 3 (1997), nor were there any differences between corresponding 11, 13, and 15-year old groups in the two cohorts. Thus, the experience of
participating in the study did not influence scores significantly. There is an increasing trend in the wish to be thinner between the ages 9 and 17, and especially in the 10 to 14-year age range.

The number of 7-year-olds reporting a wish to be thinner Year 1 (1995) (Study V) approximates the number reported by Edlund and co-workers (1996) (21.9% vs. 28%). However, a significantly higher number of 7-year-olds in the Main Cohort reported a wish to be thinner than did 7-year-olds in the Societal Cohort (1999) (Study V). This is likely to reflect unreliable reporting in this age group, which has previously been reported in Study I. Among Israeli (Sasson et al., 1995) and U.S. children (Maloney et al., 1989), the corresponding numbers of children (Grades 3-6) who had ever wanted to be thinner was 53% and 35%, respectively. Among Swedish girls, assessed with the “ever wanted” question, the figures range between 35 and 79% in the 10-16 year range. This supports the conclusions previously proposed in the discussion of the dieting data.

**Eating patterns and attitudes**

The present study demonstrated that increasing levels of dieting behavior are accompanied by increasing degrees of disturbed eating attitudes (Studies I and III), and that these attitudes increase with age among preadolescents (ages 7-8) (Study I) and are fairly stable among adolescents (ages 13-17) (Study III). There was a general increase in disturbed eating attitudes in 7-year-olds at a one-year follow-up, regardless of dieting status (Study I). This suggests an increase of the awareness of cultural demands to be thin with increasing age among these young girls. Among teenage girls, the level of disturbed eating attitudes was fairly stable over three years (1995-1997) (Study III), and Frequent Dieters displayed significantly more disturbed eating attitudes than both Intermittent and Non-Dieters. Further, Intermittent Dieters evidenced more disturbed eating attitudes than Non-Dieters. The extent to which teenage girls display a stable pattern of disturbed eating attitudes over a three-year period (1995-1997) seems to be related to their dieting status (Study III). The relatively stable patterns of disturbed eating attitudes agree with findings among teenagers of the same age over a three-year period (EAT-26) reported by Attie and Brooks-Gunn (1989). With the exception of the 11-year-olds, there were no differences between 1995 (Main Cohort) and 1999 (Societal Cohort) with respect to disturbed eating attitudes. However, the 11-year olds displayed more disturbed eating attitudes in the 1999 sample than in the 1995 sample (Study V). It is not unlikely that if there was an increase of the pressure to be thin between 1995 and 1999, it
would be reflected among the 11-year old as compared to other age groups. That is an age (elementary-middle school years) when risk behaviors seem to increase (Shisslak et al., 1998b). The only significant difference between the cohorts with regard to the number of girls in the "high-risk" group (ChEAT ≥ 15) was that they were fewer in 1999 than 1995 among the 7-year-olds. There were no other differences between 1995 and 1999 in this respect.

The present study demonstrates that eating attitudes and eating patterns contribute more than coping and self-esteem to the prediction of eating disturbances among teenagers three years later (Study IV). It should be noted that the same measure of eating attitudes (ChEAT) was used to assess both predictor and outcome variables. Therefore, there is a possibility that autocorrelations could have contributed to the relation between eating attitudes Years 2 and 3. Positive autocorrelations make the estimate of error variance too small, leading to a risk for an inflated Type I error (Tabachnik & Fidell, 1996). Thus, the predictive power of eating attitudes Year 2 for eating attitudes Year 3 may have been overestimated due to the fact that the same instrument was used to assess both dependent (outcome) and independent (predictor) variables. However, the predictive power of other eating patterns (DEBQ) suggest previous and concurrent eating behaviors to be the strongest predictors of eating attitudes Year 3. Thus, the strongest predictors were previous eating attitudes followed by the eating patterns restrained and emotional eating, and these results are in line with Calam and Waller (1998) who suggested previous eating behaviors to be the strongest predictor and risk factor for the development of eating disturbances. Causal analyses of determinants of eating disturbances are difficult to achieve. However, dieting has been hypothesized to be one of the most important predictors and risk factors for binging and other eating problems (Calam & Waller, 1998; Fairburn et al., 1997; Stice et al., 1998), and it has also been suggested that dieting causes binging (Polivy & Herman, 1985).

**Body image**

Although not significant, the body dissatisfaction score (Study I) (discrepancy between estimated and ideal body shape) was highest for the 7-8-year olds who reported dieting at both assessments, followed by girls stating that they had ever tried to lose weight Year 2. Thus, the trend is that young girls (7-8 years) who stated that they had ever dieted two years in a row estimate themselves larger than their peers, but have about the same ideal body image as the remaining groups.
Coping

In order to study coping among adolescent girls, the psychometric properties of the Adolescent Coping for Problem Experiences (A-Cope) were explored (Study II). The results showed that the original version of the A-Cope failed to demonstrate an adequate factor structure in our sample, why a revised version adapted for this group was developed. This resulted in a 28-item, six-subscale version termed the A-Cope-S, to be compared to the original version consisting of 54 items and 12 subscales. The factor pattern of the A-Cope-S was mainly cross-validated in the two separate analyses of Groups 1 and 2 (the original sample divided in two halves). This finding suggests that error variance is not a major threat to the obtained factor structure.

The majority of the items included in the A-Cope-S were organized in a factor pattern approximating that of the original A-Cope. This indicates that the results are not attributable to inadequacies in the translation of the instrument, at least not for the items included in the new version. As is true for most self-report measures of coping, the A-Cope-S (and the original A-Cope) items and scales are concerned primarily with emotion-focused rather than problem-focused strategies. Thus, few of the 28 A-Cope-S items are concerned with ways of “actively solving the problem” (except those included in Problem Solving). In general, the use of emotion-focused and internal forms of coping as well as secondary control appears to increase with increasing age (Boekarts, 1996). Thus, it is likely that the A-Cope-S is less useful for studying coping among younger adolescents, since it largely lacks items concerned with the direct forms of coping employed by this age group.

There are contrasting findings regarding coping and eating behaviors in the literature, some researchers suggesting avoidance-oriented coping to be related to eating disturbances (e.g., Koff & Sangani, 1997), and others that avoidance coping does not predict eating problems (Paxton & Diggens, 1997). The impact of coping in the present studies was limited, both with regard to differentiating groups of adolescents based on dieting prevalence (Study III), and as a predictor of disturbed eating attitudes Year 3 (Study IV). Our results contrast to previous findings demonstrating that clinical as well as non-clinical samples of females (ages 23-26) scoring high on eating disorders instruments employ emotionally or avoidance-oriented coping strategies (assessment of general coping) more than non-eating disordered/low scoring individuals (e.g., Soukup et al., 1990; Troop et al, 1994).
Among Intermittent and Non-Dieters (Study III), higher disturbed eating scores were accompanied by higher Avoidance coping scores. Also, in the entire sample of adolescent girls (Study IV), coping by using Social Support and Avoidance Year 1 was negatively correlated with disturbed eating attitudes Year 3, and so was coping by Acting Out, Avoidance and Taking Light Year 3. In addition, Distractions Year 3 was positively correlated with concurrent eating attitudes. Thus, more use of problem behaviors (e.g., stay away from home, smoke, get angry and yell at people) and distractions (eat food, go shopping, take prescribed drugs), and less use of social support (e.g., do things with the family, talk with mother or father) were related to more disturbed eating attitudes Year 3.

Among frequent dieters (Study III), significant inverted U-shaped associations suggested the highest levels of avoidance to be accompanied by no more disturbed eating attitudes than low avoidance scores. There is no ready explanation of this finding. One line of thought is that those girls who have the most disturbed eating attitudes may also have more perfectionistic tendencies (Bastiani, Rao, Weltzin, & Kaye, 1995), and that these tendencies may not be compatible with a frequent use of the coping behaviors tapped by the present avoidance items.

These findings in Studies III and IV agree with previous studies, indicating that disturbed eating attitudes are related to avoidance and emotion-oriented coping (e.g., "hoped a miracle would happen"; Koff & Sangani, 1997; Troop et al., 1994; 1998). Thus, more disturbed eating attitudes were at least partially related to the employment of more maladaptive coping strategies when facing difficult situations or trying to manage stress. It should be noted that several of the significant correlations were fairly low, why their practical utility is questionable. However they should be useful for generating hypotheses for future studies. The fact that there is a specific pattern of significant correlations between disturbed eating attitudes and coping by avoidance among Intermittent and Non-Dieters (Study III), suggests that these results are not an artifact of the large number of computed correlations. In the latter case, a more random pattern of correlations would have been expected.

The only coping variable contributing to the prediction of disturbed eating attitudes Year 3 was Taking Light Year 3 (Study IV). However this prediction was weak. There were no differences with regard to coping between groups differing in dieting (Study III). The reason for this may be that the A-Cope-S is not sensitive enough to pick up such differences, although the results of the correlational analysis suggest that the relations between eating
attitudes and coping require further exploration. Furthermore, coping in general, and avoidance coping in particular did not contribute to the prediction of disturbed eating attitudes. One possibility is that general coping is related to eating disturbances in adult samples of eating disordered individuals as well as among young adult females scoring high on eating disorders instruments, but not among teenagers. The results of Studies III and IV suggest that relationships between coping and eating problems should be explored by non-linear as well as linear methods. A substantial role for coping responses remains to be demonstrated in this context.

**Self-esteem**

Previous research (Fisher et al., 1991) has shown self-esteem, risk behaviors (e.g., smoking cigarettes) and anxiety to be associated with eating disturbances among adolescent girls (age 16). Self-Esteem Year 1 (Study IV) contributed, as expected, to the prediction of disturbed eating attitudes Year 3. However, this contribution was weak indicating that self-esteem was not a strong predictor of disturbed eating attitudes in this sample. This was rather surprising considering the significant, although moderate associations between self-esteem and disturbed eating attitudes in the bivariate correlational analysis (Study IV). These results are in line with previous research by Button and co-workers (1996), and Wood and co-workers (1994) who demonstrated an association between self-esteem and unhealthy eating. Thus, our conclusion is that self-esteem seems to be of limited predictive value for disturbed eating attitudes in teenage girls. However, additional multiple regression analyses were conducted in order to find out what combination of variables accounts for the shared variance between self-esteem and disturbed eating attitudes Year 3. Regression models were built starting with self-esteem Years 1 and 2 only as predictor variables. Thereafter the coping variables included in previous models were successively added until self-esteem Years 1 and 2 failed to predict disturbed eating attitudes Year 3. This yielded a model where self-esteem Years 1 and 2 contributed significantly to the prediction of disturbed eating attitudes Year 3 (variables included in the model were self-esteem Years 1 and 2, Social Support Year 1, and Avoidance Year 1 and 3). Thus, the effects of self-esteem did not seem to be mediated by coping. Previous research (Fryer et al., 1997) has shown coping to be related to self-esteem, which in turn was related to disturbed eating attitudes among adolescents. The results presented by Fryer and co-workers, suggesting a relation between self-esteem, coping and disturbed eating was not supported in Study IV.
Conclusions

Dieting behavior and the wish to be thinner are evident from age 7, and dieting behavior is accompanied by more disturbed eating attitudes. An age-related landmark for the developmental process leading to an eating disorder may be the expression of discontent over feeling overweight and taking action toward thinness (Sasson et al, 1995). Our results suggest that such behaviors and discontent may start as early as at 7 years of age, and that repeated dieting attempts correlate with disturbed eating attitudes in Swedish girls. Increases in dieting attempts occur between the ages 9 and 13. Further, there seems to be no further increase of disturbed eating attitudes between ages 13 and 17.

Comparisons were performed to investigate the possible effects of participation in earlier assessments (Years 1 and 2, Study V) on replies at the Year-3 assessment. There were no significant differences in the wish to be thinner between girls who turned 9, 11, 13 or 15 years old at the third assessment, and those who were 9, 11, 13, or 15 at the first assessment. The same pattern was evident with regard to differences in dieting among girls who turned 9, 11, or 13 at the third assessment (1997) and those who were 9, 11, or 13 at the first assessment (1995). Thus, the experience of participation had no impact in these respects.

The Societal Cohort was employed to explore the extent to which girls who were 7-15 years in 1999 differed from girls if the same ages in 1995 (Main Cohort). With a few exceptions among the 7 and 11-year olds, there were no such differences. Among the 7-year olds, a higher number of girls expressed the wish to be thinner in 1995 (Main Cohort) than in 1999 (Societal Cohort). Further, a higher number of 7-year olds scored ≥15 on the ChEAT ("high-risk" group) in 1995 (Main Cohort) than in 1999 (Societal Cohort). The 11-year olds displayed significantly more disturbed eating attitudes in 1999 as compared to 1995. Thus, without these exceptions, there is no evidence of a trend in Swedish society toward a more intense drive for thinness or more dieting in these age groups at least not between 1995 and 1999.

Another conclusion is that eating patterns and attitudes are the strongest predictors of disturbed eating attitudes three years later in this group of adolescents girls. The results also indicate that less use of coping by taking things light (joke, tell yourself the problem is not important) and lower self-esteem are related to more disturbed eating attitudes, but these relations are very weak. Our results agree with previous research suggesting earlier eating
patterns and attitudes, lower self-esteem and mainly avoidance oriented coping to be related to eating problems (Button, Loan, Davies, & Sonuga-Barke, 1997; Fairburn et al., 1999; Garner 1993; Kille, et al., 1994; Koff & Sangani, 1997; Lunner et al., in press). Based on the present study, early assessment of eating patterns and attitudes is suggested to be a potentially important predictor for the development of more serious eating disturbances among adolescent girls. The indication that the prevalence of dieting behavior levels out approximately after age 13, supports the suggestion by Shisslak and co-workers (1998b) that assessment of eating behaviors should begin before adolescence. Further, these trends suggest that girls who may be at an increased risk for more serious eating disturbances [Frequent Dieters, Study III, "high-risk" group (ChEAT ≥ 15), Study V] should be identified before the age of 13, and around age 11 when the most dramatic increase in the wish to be thinner and dieting behaviors occurs. Thus, this results suggest that preadolescent girls (< age 13) should be included in studies of the predictive power of dieting behaviors for future eating problems. However, the stable trend of eating disturbances reported by 13-15 year old (Year 1) Frequent Dieters (Study III) suggests that these group may be at an increased risk for future eating problems, and that this is also a group that should be targeted when designing preventive interventions for eating disorders.

Methodological discussion

Strengths

All studies except Study II employ repeated assessment-designs (1-5 years). Study I is a one-year follow-up after a baseline assessment, whereas Studies III-V employ an accelerated multi-cohort design comparing different age groups over time. The strength of these designs is that they provide the possibility to study a phenomenon over time, as opposed to at one point of time (cross-sectional designs). It enables the study of developmental processes, prognosis and duration, the prediction of an expected outcome, the effect of certain events or critical periods of time, and the effect of preventive efforts or treatments. Further, prospectively collected data are more reliable than data collected by retrospective report.

Other methodological strengths concern sample sizes and multiple observations. One advantage of longitudinal designs and multiple observations is the ability to compare the same individual at different points of times, which enables within-person analyses of individual change (Farrington, 1991). Further, multiple observations are advantageous in order to investigate stability and continuity over time, developmental sequences (different
manifestations of the same construct at different ages) and to explore how far off in time an event can be predicted by an earlier event (Farrington, 1991). The samples in the present studies were recruited by stratified random selection and consisted of 1000-1700 girls (Studies II-V). The relatively large sample size and the recruitment procedure suggest limited threats to external validity.

**Limitations**

The main limitation of Study I lies in the size of the sample. By decreasing power, the small size of three of the groups in the analyses of variance increases the risk for Type II errors. Thus, true group differences may have gone undetected. However, the fact that several significant between-group differences were demonstrated argues against this notion. Still, the results of the analyses of variance need to be interpreted with caution and replication in a larger sample is warranted.

One limitation of Studies II-V is the relatively large number of non-participants. It is likely that the large proportion of non-participants reflects hesitation to make a commitment to a 7-year longitudinal study. A cross-sectional study with a single point of assessment would presumably have resulted in a larger proportion of participants. In order to shed some light on the possible influence of the dropouts, we compared eating attitudes of the girls who participated Year 1 only with those participating at all assessments (Studies III and V). There were no significant differences with regard to eating attitudes in any of the age groups.

The construction of a Swedish version of the coping questionnaire Adolescent Coping for Problem Orientation (A-Cope) (Study II) resulted in the exclusion of two subscales of the original A-Cope from the A-Cope-S (Swedish version). The themes of these subscales are Seeking Spiritual Support or Seeking Professional Support. For six additional subscales of the original A-Cope, only one or two items remained in the new version. The loss of items and subscales may be the result of cultural differences in how teens handle problems and manage difficulties in the U.S. and Sweden. However, we have not been able to locate any cross-cultural studies to validate this notion. These losses may have limited the content validity of the A-Cope-S.

A potential problem in interviewing young children is the risk that they may have trouble to fully understand the questions (Studies I and V). We have attempted to avoid that problem by
conducting structured individual interviews. This gives the possibility of explaining difficult words, and to make sure that the child does not misunderstand the content of the questions. According to our experience, children are willing to share their thoughts and attitudes and report on their behavior regarding dieting and eating patterns when asked, provided that confidentiality is assured. Instruments such as the measure of disturbed eating attitudes (ChEAT) have been reported to be reliable among young children (Kelly et al., 1999). However, answers to the ChEAT questions in this age group should be interpreted cautiously since some of the items were not originally formulated for a child population (e.g. items targeting 'vomiting') (Ricciardelli & McCabe, in press). Younger children have been reported to score higher than older children on measures such as the ChEAT (Ricciardelli & McCabe, in press). This is evident also among the 7-year olds in the Main Cohort (Study V), and in Study I we found evidence of contradictory replies to the question of "ever dieted". This suggests that it is crucial to develop an interview procedure that ensures the child’s comprehension of the issues of interest, in order to avoid misunderstandings. The staff involved in the present project (Study II-V) received training in interviewing as well as in the procedure of classroom assessment (how to explain the purpose and procedure of the study as well as how to respond to students’ questions). Our assessment method accords with the procedure used by a number of researchers (Gustafson-Larson & Terry, 1992; Hill & Silver, 1995; Kolody & Sallis, 1995; Ohzeki, Otahara, Hanaki, Motozumi, & Shiraki, 1993; Rolland, Farnhill & Griffiths, 1996; Tiggeman & Wilson-Barrett, 1998). In these reports, issues related to eating behaviors were studied in children 7-10 years of age. The conclusions from this research are that children in that age range are aware of the cultural demands of Western society, and engage in restrictive eating behaviors (Hill & Pallin, 1998; Kostanski & Gullone, 1999; Rolland, Farnhill, & Griffith, 1997; Shapiro, Newcomb & Loeb, 1997; Veron-Guidry & Williamson, 1996). Thus, there is little reason to question the validity of our procedure, although the issue has been raised whether children as young as 8 years fully understand all the questions of the instrument used for assessing disturbed eating attitudes (ChEAT) (Rolland et al., 1997).

It should be noted that the question that constitutes the basis for the classification of groups of Dieters/Non-Dieters (Study I) and Frequent-, Intermittent-, and Non-Dieters (Study III) (“Are you trying to lose weight today?” yes/no) assesses the same general dimension as the subscale "dieting" in the measure of disturbed eating attitudes (ChEAT). In order to exclude this possible conceptual confounding, additional analyses were conducted excluding items
assessing weight loss attempts. The results indicated the groups formed on the basis of the dieting frequency question differ with respect to other dimensions of dieting than actual weight loss attempts (Study III).

Future implications and directions

*Preventive interventions based on empirically sound risk models*

The knowledge obtained from longitudinal research among healthy children and adolescents may be one way of approaching the risk factors predisposing the onset of disturbed eating patterns (Attie & Brooks-Gunn, 1989; Fairburn & Beglin, 1990; Huon & Strong, 1998; Killen et al., 1994; Shisslak et al., 1995). Also, as suggested by the McKnight project (Shisslak et al., 1998b), it is important to identify specific risk and protective factors related to the development of eating disturbances in order to enable the tailoring of appropriate interventions to those groups that need them.

It has been suggested (Shisslak 1995) that the results of longitudinal studies can be of great value when designing prevention programs for specific age-groups, thereby enhancing their effectiveness in decreasing the number of children and adolescents who engage in dieting and problematic eating behaviors. Further, it is of great importance to first identify potential risk-and protective factors that could be related to the onset and maintenance of eating disorders (Shisslak et al., 1999). The information gained from such studies could be used to design effective prevention programs for eating disorders as well as eating disturbances that may serve as precursors to clinical eating disorders (Shisslak et al., 1999).

There are suggestions in the literature that that teaching females to be more critical consumers of media aimed at beauty and appearance may help prevent the internalization of messages, and then in turn prevent the development of body dissatisfaction and disturbed eating behaviors (Berel & Irving, 1998). Further, self-esteem may be enhanced by the experience of success in a domain that is important to the individual (Shisslak et al., 1998a). Interventions teaching self-esteem should be conducted with caution since it is crucial that the individual experiences a feeling of success in order to achieve the desired effect (a boost of self-esteem). Otherwise, there is a risk of an opposite effect, namely a reduction of self-esteem. Thus, interventions teaching self-esteem should offer the opportunity of experiencing success in a domain that is of individual importance. To achieve this it is important to first formulate individual targets for the experience of success, rather than to employ a pre-determined
intervention format in general use in groups of children and adolescents. There is a risk that a non-specific intervention that is not individually designed, may lead to a drop rather than a boost in level of self-esteem (Shisslak et al., 1998a).

Research from studies of preventive efforts are so far contradictory. In one study, preventive efforts have been shown to reduce disturbed eating behaviors and body dissatisfaction during a short period of time (Moreno & Thelen, 1993). In others, there has been no evident effect at all (Paxton, 1993; Smolak et al., 1998), or even an increase in eating problems (Carter, Stweard, Dunn, & Fiarburn, 1997). These results as well as the high cost and relatively low success rate of treatment for clinical eating disorders lend justification to an investment of time and resources in research on preventive efforts (Neumark-Sztainer, 1995).

Suggestions for future research
Research is needed to investigate the relationships between coping and eating problems, preferably by using methodology that can distinguish between mediating and moderating effects (Baron & Kenny, 1986). This may be of interest since several factors have been suggested to mediate the relationships between stress and eating pathology (e.g., self-esteem; Fryer et al., 1997). Future research should focus on distinguishing which precursors are the strongest predictors, and how these variables interact (Phelps, Johnston & Augustyniak, 1999). This should be conducted through longitudinal studies (Shisslak et al., 1998) with younger children that can demonstrate causal effects by showing the effects of a specific event by tracking the course of development (Farrington, 1991). Future studies should also emphasize the identification of specific risk and protective factors (Shisslak et al 1998b) that can be effectively modified (Phelps et al., 1999).

Another suggestion for further studies concerns the validity of using self-report/structured interview methodology among young children, although there are indications that young children are able to handle these types of questions.

Implications for school health care
Implications of present results
Girls in the present studies (I and III) who report that they have tried to lose weight or are currently trying to do so, display more disturbed eating attitudes. There was also a stable pattern of disturbed eating attitudes based on dieting frequency over a three-year period
Thus, girls who reported dieting behaviors two and three years in a row displayed more disturbed eating attitudes than their intermittently or non-dieting peers. This was evident both among 7-8-year olds (Study I) and 13-17 year olds (Study III). Dieting behaviors per se warrant the attention of school health care providers. The results affirm that simple questions about weight loss attempts may single out girls at an increased risk of developing more serious eating disturbances, although the identification of dieting per se will certainly lead to the identification of a number of false positives. However, this may still be motivated since questions about dieting behaviors may be a meaningful first screening measure to apply in at-risk populations in order to reduce the risk of potential eating disturbances. Earlier eating attitudes, and patterns (restrictive and emotional eating), and possibly self esteem predict disturbed eating attitudes three years later. Therefore, eating behaviors focusing on healthy eating and exercise appear to be appropriate targets for school health care interventions. There were a few correlations between disturbed eating attitudes and lower self-esteem and more problem behaviors such as staying away from home, smoke and get angry and yell at people. Although some of these variables did not predict power of disturbed eating attitudes in Year 3, the bivariate correlations should not be dismissed. School health care providers should focus not only on eating behaviors and dieting, but also on problem behaviors such as smoking and acting out, since there are indications that such behaviors are related to other adjustment problems (Wångby et al., 1999) as well as eating disturbances (Fisher et al., 1991).

**Implications of research on preventive efforts**

A main limitation of previous preventive interventions has been the sole reliance on didactic presentations of information with the main focus on apparent risk factors (e.g. concerning HIV/AIDS, sexual risk behaviors, alcohol and drug use) (Dielman, 1994). However, enhanced knowledge is not sufficient to change actual behaviors (Dielman, 1994). Based on the present study and the contradictory results of the research on prevention, we suggest bottom-up discussions based on the individual's own experiences about issues of bodily changes during puberty, and the unattainable ideal body shape of contemporary Western society to be appropriate targets for school interventions. Further, the importance of a high sense of self-esteem, which may be attained through the experience of success, as well as an adaptive way of solving everyday problems and managing tension are two other factors that may play a role in this context. Finally, and above all, the importance of healthy eating patterns for maintaining a normal body weight and general health status should be stressed. The hazards
of dieting and disordered eating may serve as dieting tips (Carter et al., 1997) and should therefore be avoided.
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