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Dysfunctional Schemas and Psychopathology in Referred Obese Adolescents

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Objective: Referred obese adolescents often display psychological problems. The present study aimed at investigating whether Young's schema theory constitutes a comprehensive framework to understand psychopathology in youth in general and in referred obese adolescents in particular. Methods: 91 youngsters referred for obesity treatment and 91 normal weight controls (all between 12 and 18 years of age) filled out the Young Schema Questionnaire and the Youth Self-Report. Parents were asked to complete the Child Behavior Checklist. Results: The obese youngsters displayed an overall greater severity of dysfunctional schemas than normal weight controls. The obese group scored significantly higher for the schemas Emotional Deprivation, Social Isolation/Alienation, Defectiveness/Shame, Failure to Achieve, Dependence/Incompetence and Subjugation. Social Isolation/Alienation and Vulnerability to Harm/Illness were highly predictive for internalizing symptoms in youth. The schemas Entitlement and Dependence/Incompetence were predictive for externalizing symptoms in youth. Conclusion: Referred obese individuals display high levels of maladaptive schemas and these are generally related to internalizing and externalizing symptoms. Copyright © 2007 John Wiley & Sons, Ltd.

INTRODUCTION

Many children and adolescents referred for obesity suffer from comorbid psychological problems (Zametkin, Zoon, Klein, & Munson, 2004). Hence, a comprehensive psychopathology model guiding research on and management of emotional and behavioural problems in treatment-seeking obese youngsters seems crucial. In the eating disorder literature, Waller and colleagues recently pointed to the central role of dysfunctional schemas in explaining disordered eating (Waller, 2003; Waller, Ohanian, Meyer, & Osman, 2000). In line with the affect regulation model (Grilo, Shiffman, & Carter-campbell, 1994), these authors consider overeating in bulimia nervosa and binge eating disorder as a compensatory mechanism to deal with negative emotions (Waller, 2000). In cognitive theory, it is presumed that such emotions and coping behaviour are associated with the activation of schemas. Although this schematheory has basically been formulated to understand binge eating in adults, there are several findings that suggest its usefulness to conceptualize (over)eating in youth as well. A substantial proportion of referred obese youngsters actually reports so-called emotional eating (Braet & Van Strien, 1997) and exhibits episodes of binge eating (Decaluwe, Braet, & Fairburn, 2003).

As outlined in cognitive models on psychopathology (Beck, 1967; Beck, Rush, Shaw, & Emery, 1979), it is assumed that schemas result from early experiences with significant others. According to Young (Young, 1999; Young & Klosko, 1994; Young,

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Klosko, & Weishaar, 2003), specific dysfunctional schemas and maladaptive coping styles develop when basic childhood needs such as secure attachment to others or freedom to express emotions are not fulfilled. Based on clinical experience, Young refined Beck's original cognitive model by distinguishing 18 early maladaptive schemas, different as regards content. In stressful life circumstances, these dysfunctional schemas and coping strategies are triggered and make people vulnerable to develop psychological problems. As such, this model is generally referred to as a cognitive diathesis-stress perspective on psychopathology.

The incorporation of Young's psychopathology model in child and adolescent psychopathology research is still in its infancy (Muris, 2006). Recently, initial attempts have been made to adopt relevant adult literature findings in youth, at first precisely within the context of overeating and eating disorder symptoms (Cooper, Rose, & Turner, 2005; Turner, Rose, & Cooper, 2005). For the Young model to be of any relevance for the study of psychosocial problems in youth in general and in referred obese youngsters in particular, two conditions should at least be met. First of all, high levels of maladaptive schemas are to be demonstrated in clinical groups of obese adolescents as compared with normal weight controls. Recently, Anderson, Rieger, and Caterson (2006) found an overall greater severity of dysfunctional schemas in treatment-seeking obese adults compared with normal weight controls. Exploratory analyses on an individual schema level revealed that both groups differed most markedly for the schemas Social Isolation/Alienation, Defectiveness/Shame and Failure to Achieve. In obese youth, no similar studies have been published. Turner et al. (2005) recruited 367 adolescent girls and selected the top and bottom 10% on Body Mass Index (BMI), respectively referred to as the overweight and the control group. The overweight girls scored significantly higher for the Young schemas Emotional Deprivation, Abandonment/Instability, Subjugation and Insufficient Self-Control/Self-Discipline. Generalization of the latter findings is, however, hampered by a small sample size ($n = 46$) and by the sole inclusion of 17–18-year-old overweight females. The first aim of the present study was to explore the presence of maladaptive schemas in a clinical group of obese youngsters compared with normal weight controls. In general, it was hypothesized that referred obese subjects would display a greater severity of dysfunctional schemas than non-obese youngsters.

The second prerequisite implies the general correlation of schemas and psychological symptoms in youth. In studies on the validity of Young's theory to understand psychopathology in adults, this association was clearly demonstrated in both referred and non-referred samples (Calvete, Estevez, de Arroyabe, & Ruiz, 2005; Schmidt, Joiner, Young, & Telch, 1995). However, as dysfunctional schemas are presumed to develop early in life and to subsequently create vulnerability for psychological problems, this association must be demonstrable from childhood onwards. Hence, the second goal of the study was to model the relations of maladaptive schemas and psychopathology in youth. In line with recent findings by Muris (2006), it was hypothesized that a clear association of dysfunctional schemas on the one hand and internalizing as well as externalizing problem behaviour on the other hand could be demonstrated in adolescents.

Psychopathology research in youth is characterized by low agreement of informants (Achenbach, Mcconaughy, & Howell, 1987). In a clinical sample of obese youngsters, Zeller, Saelens, Roehrig, Kirk, and Daniels (2004) demonstrated that when relying on self-report, 38.9% of the adolescents were classified as 'at risk' for somatization problems, 18.6% for anxiety and 25.5% for depression, while mother report resulted in classification of respectively 54.2, 37.3 and 55.9% of the adolescents as 'at risk'. Moreover, adolescent reported self-esteem correlated strongly with self-reported anxiety ($p < 0.001$) and depression ($p < 0.001$) while the association with internalizing problems as reported by the mother was more modest ($p < 0.01$). No significant association was found between adolescent reported self-esteem and mother reported externalizing problems. Hence, differing conclusions on the presence of psychopathology and its correlates can be drawn, depending on the informant one relies on. To address this impasse, combining multiple informants for the assessment of psychopathology is still considered the 'gold standard' in research as well as in clinical practice (Achenbach et al., 1987). Multiple informants are needed to obtain an overall picture of the child's functioning across persons and situations. Furthermore, with multiple informants, one partially controls for shared method variance, which is generally held responsible for the strong correlations between predictor variables and measures of psychopathology of one common rater. Finally, using composite scores reduces the number of analyses, which, in turn, enhances the power of statistical

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testing. Yet no consensus exists on how multiple informant data should be managed and integrated (Mash & Hunsley, 2005). Van Leeuwen, Mervielde, Braet, and Bosmans (2004) used Principal Component Analysis to extract a common factor score from each pair of ratings provided by different informants. For the present study, this strategy was used to combine raw psychopathology scores as obtained by the adolescents and one of their parents.

METHODS

Participants

The obese sample consisted of 91 obese adolescents (53 girls; 38 boys) admitted for obesity treatment. These participants had a mean age of 14.91 years (Standard Deviation [SD] = 1.53; range 12–18) The non-obese sample consisted of 91 normal weight adolescents (52 girls; 39 boys) recruited via two secondary schools. The participants in the non-obese sample had a mean age of 15.02 years (SD = 1.68; range 12–18). Both groups did not differ on age, $F(1,180) = 0.21$, $p = 0.65$ and gender was equally distributed, $\chi^2(1) = 0.02$, $p = 0.88$ in both groups.

Measures

In the obese sample, *adolescent's length and weight* were registered by a paediatrician during the first week of stay at the treatment centre. In the normal weight sample, weight and length were measured via self-report. Subsequently, the adjusted BMI (Adjusted BMI = Actual BMI/Percentile 50 of BMI for age and gender × 100) was calculated for each participant with reference to the European BMI values for 0–21-year-olds (Fredriks, van Buuren, Wit, & Verloove-Vanhorick, 2000). In addition, to compare the degree of overweight of the present European sample with US-studies on overweight, BMI z-scores and BMI percentiles based on the 2000 Centers for Disease Control and Prevention (CDC) growth charts (Ogden et al., 2002) were calculated. Youngsters below the 85th percentile are defined as 'normal weight', youngsters from the 85th to 95th percentile are defined as 'at risk for overweight' and youngsters at or above the 95th percentile are defined as 'overweight'.

Familial *socio-economic status (*SES*)* was calculated using the Hollingshead Index of Social Position (Hollingshead, 1975), based on parental education and occupation. By this index, youngsters' families are categorised as belonging to upper, upper middle, middle, lower middle or lower social class.

The *Young Schema Questionnaire* (YSQ: Young & Brown, 1990)-*Short Version* is a 75-item adult self-report questionnaire that assesses 15 of the 18 early maladaptive schemas as identified by Young. Each item is phrased as a negative belief regarding self, to be rated on a Likert scale from 1 ('completely untrue of me') to 6 ('describes me perfectly'). An individual schema score is obtained by averaging scores on the five items each schema consists of. The Dutch translation of the YSQ-Long version (Sterk & Rijkeboer, 1997) demonstrates good psychometric properties in clinical and non-clinical adult populations (Rijkeboer & van den Bergh, 2006; Rijkeboer, van den Bergh, & van den Bout, 2005). However, administering the 205-item long version in adolescents raises concerns regarding reliability. Moreover, in adult populations, the short and the long version of the YSQ show comparable psychometric properties (Waller, Meyer, & Ohanian, 2001). Therefore, corresponding items constituting the short version were extracted from the Dutch long version for adults. These items were rephrased so to be comprehensible for adolescents and fit in their living environment. This Dutch adolescent short version (Van Vlierberghe, Rijkeboer, Hamers, & Braet, 2004) was backtranslated and sent to the original author for approval. Cronbach alfa's for the differing schemas in the present study, are presented in table 2.

The *Child Behavior Checklist* (CBCL: Achenbach, 1991a) and *Youth Self Report* (YSR: Achenbach, 1991b) are questionnaires assessing emotional and behavioural problem areas as reported respectively by parent and child. For both the parent and the child, a global internalizing and externalizing problem score can be obtained. Dutch versions of the CBCL and the YSR are reliable and valid instruments for the assessment of psychological symptoms in youth (Verhulst, Van der Ende, & Koot, 1996, 1997). Based on data from a large community sample of Dutch children and adolescents, T-scores can be computed to identify youngsters 'at risk', namely those with a T-score equal to or above 63. For research purposes, the authors recommend working with raw scale scores. However, to facilitate comparison with previous studies, baseline analyses are presented by means of T-scores. Forty-six parents (25.27%) did not return the CBCL and 4.95% of the YSRs were not valid. In both cases, the score of the other informant substituted the

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missing value for the construction of the composite psychopathology score.

Procedure

The institutional review board of Ghent University reviewed and approved the protocol of the present study.

For the obese group, all youngsters enrolled in the treatment programme who were between 12 and 18 years of age, with a normal intelligence and following regular education were eligible for the study. Adolescents with secondary obesity due to, for example, Prader-Willi Syndrome, were excluded, just like adolescents with a pervasive developmental disorder. The study started during the summer of 2004 and the data were gathered in four consecutive waves. Each time in July and January, all eligible adolescents who were admitted to the centre were invited to participate at the start of the treatment programme. Across the four waves, 97 obese adolescents met the inclusion criteria. The staff of the centre requested to leave out one girl, as she suffered from a severe psychiatric disorder (psychosis). After the explanation of the objectives and the procedure, informed consent was obtained from children and their parents. Two youngsters refused to participate, two dropped out and for one boy, the administration of the questionnaires had to be interrupted.

Two secondary schools were contacted and both agreed to take part in several studies on eating and psychopathology conducted by our research group. The sampling of these schools was based on grade (from 1 to 7), type of curriculum (general, technical and vocational education) and school type (public and catholic). The cooperation of both schools in the present study resulted in a total sample of 302 adolescents, diverse regarding age, gender and SES. Parents and adolescents were informed about the objectives and the procedure of the study. Adolescents who refused to report on their weight (n = 15; 4.97%), youngsters with an adjusted BMI equal to or above 120% (n = 58; 19.21%) or above age 18 (n = 41; 13.58%) were excluded. Finally, normal weight controls were randomly omitted so as to equalize the obese and the non-obese group as much as possible regarding number, age, gender and SES.

Data Analysis

To address the first research goal, a Multivariate Analysis of Variance (MANOVA) with YSQ-scores as dependent variables and with weight status as factor was conducted. When an overall difference between the obese and the normal weight group was demonstrated, exploratory Analyses of Variance (ANOVAs) were done on an individual schema level. Next, the association of maladaptive schemas on the one hand and of internalizing and externalizing problem behaviour on the other was inspected. Two hierarchical regression analyses were ran, with the composite internalizing and externalizing symptom scores as dependent variables. Age, gender and SES were entered simultaneously as control variables in block 1, weight status in block 2 and finally, all 15 maladaptive schemas were entered stepwise as predictors in block 3. Dummy coding was used for the categorical variables gender (0 = boy; 1 = girl) and weight status (0 = normal weight; 1 = obese). Regression analysis partials out the intercorrelation between schemas and determines the most parsimonious model of links between schemas and psychopathology. Because of the exploratory nature of the present study, the stepwise method was considered appropriate. Based on guidelines by Cohen (1977), with $\alpha = 0.05$, a desired power of 0.80 and a hypothesized conventional medium effect size ($f^2 = 0.15$), the MANOVA required a total sample size of 138 youngsters. For the hierarchical regression analyses, with $\alpha = 0.05$, a hypothesized conventional medium effect size ($f^2 = 0.15$), four control variables and 15 predictors, the hierarchical multiple regression analyses required 142 participants. Both conditions were met.

RESULTS

Anthropometric and Demographic Descriptives

In the obese sample, the mean adjusted BMI was 183.25 (SD = 26.75; range 132.88–273.92) and the mean CDC BMI z-score was 2.27 (SD = 0.32; range 1.39–3.07). Based on CDC BMI percentiles, all of these youngsters fell within the overweight range (>95th percentile). In the normal weight sample, the mean adjusted BMI was 99.93 (SD = 10.41, range 78.90–119.39) and the mean CDC BMI z-score was −0.38 (SD = 0.82; range −2.83–1). Based on CDC BMI percentiles, all these youngsters fell within the normal weight range (<85th percentile). As expected, the obese adolescents had a significantly higher adjusted BMI than the non-obese adolescents, $F(1,180) = 767.12$, $p < 0.001$.

According to Hollingshead four factor index of SES, 3.30% of the obese adolescents' families were

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Table 1. Percentage of adolescents identified as 'at risk', mean T-scores for internalizing and externalizing problems and differences between the obese and the normal weight group

	Obese group		Normal weight group		*F*
	% at risk	Mean (SD)	% at risk	Mean (SD)	
YSR					
Internalizing	46.34%	60.37 (12.22)	27.47%	55.05 (12.12)	8.22**
Externalizing	26.83%	55.87 (10.46)	18.68%	53.23 (10.53)	2.72
CBCL					
Internalizing	56.16%	64.19 (12.00)	14.29%	49.14 (11.01)	57.36***
Externalizing	47.95%	60.25 (12.16)	17.46%	51.78 (10.96)	17.96***

** $p < 0.01$. *** $p < 0.001$.
SD = Standard Deviation. YSR = Youth Self Report. CBCL = Child Behavior Checklist. % at risk = percentage of adolescents scoring equal to or above T = 63.

in upper middle, 45.05% in middle, 43.96% in lower middle and 4.40% in lower social class. Two obese adolescents (2.20%) permanently lived in an institution, and for one adolescent, no information on SES was obtained. In the normal weight sample, 9.89% of the youngster's families were in upper middle, 37.36% in middle, 41.76% in lower middle and 9.89% in lower social class. Again, from one adolescent, no information on SES was obtained. No difference between groups on SES was found, $F(1,176) = 0.10$, $p = 0.76$.

Baseline Analyses: Internalizing and Externalizing Problem Scores in Obese Youngsters and Normal Weight Controls

In the obese group, 46.34% of the adolescents who filled out the YSR exceeded the cut-off on the internalizing and 26.83% on the externalizing problem scale. In the normal weight group, prevalence rates were 27.47% for internalizing and 18.68% for externalizing problems. In the obese group, 56.16% of the parents who filled out the CBCL exceeded the cut-off on the internalizing and 47.95% on the externalizing problem scale. In the normal weight group, prevalence rates were 14.29% for internalizing and 17.46% for externalizing problems. One-way ANOVAs revealed that the obese group scored significantly higher for self-reported internalizing, $F(1,171) = 8.22$, $p < 0.01$, but not for externalizing, $F(1,171) = 2.72$, $p = 0.10$, symptoms. The obese group scored significantly higher for internalizing, $F(1,134) = 57.36$, $p < 0.001$, and externalizing, $F(1,134) = 17.96$, $p < 0.001$, symptoms as reported by the parents. Scores are summarized in Table 1. After calculating composite scores, significant differences remained.

Maladaptive Schemas in Obese Adolescents

Overall, obese youngsters differed from normal weight controls concerning dysfunctional schemas, $F(15,158) = 1.85$, $p < 0.05$. The overweight group scored significantly higher for the schemas Emotional Deprivation, $F(1,172) = 4.67$, $p < 0.05$, Social Isolation/Alienation, $F(1,172) = 7.34$, $p < 0.01$, Defectiveness/Shame, $F(1,172) = 6.23$, $p = 0.01$, Failure to Achieve, $F(1,172) = 7.78$, $p < 0.01$, and Dependence/Incompetence, $F(1,172) = 6.12$, $p = 0.01$, and Subjugation, $F(1,172) = 3.97$, $p = 0.05$. Cronbach α's for each YSQ subscale, mean schema scores for both groups and *F*-values for between group differences are depicted in Table 2.

Exploration of the Predictive Validity of Maladaptive Schemas for Internalizing and Externalizing Problem Behaviour in Youth

Due to the intercorrelation of predictors, multicollinearity might arise, which can seriously influence multiple regression analysis. A generally used rule of thumb implies that the Variation Inflation Factor for each predictor should not exceed 10. This condition was met for the present data.

A first hierarchical multiple regression analysis (see Table 3) was conducted with the composite internalizing problem score as the dependent variable. After entering block 1 (age, gender and SES), analysis revealed that these control variables made a significant contribution to the model, $F(3,165) = 6.61$, $p < 0.001$, due to a significant gender difference. Next, weight status was entered in block 2, resulting in a significantly better explanation of the variance in internalizing problems, $R^2Change = 0.10$, $p < 0.001$. In block 3, the schema Social Isola-

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Table 2. Means on maladaptive schemata and differences between the obese and the normal weight group

YSQ-subscales	α	Obese group	Normal weight group	*F*
		Mean (SD)	Mean (SD)	
Emotional Deprivation	0.76	2.04 (1.06)	1.73 (0.84)	4.67*
Abandonment/Instability	0.86	2.87 (1.33)	2.52 (1.24)	3.27
Mistrust/Abuse	0.76	2.46 (1.08)	2.20 (0.84)	3.01
Social Isolation/Alienation	0.85	2.30 (1.34)	1.84 (0.87)	7.34**
Defectiveness/Shame	0.74	2.10 (1.05)	1.74 (0.85)	6.23**
Failure to Achieve	0.81	2.39 (1.13)	1.96 (0.93)	7.78**
Dependence/Incompetence	0.72	2.25 (1.01)	1.90 (0.84)	6.12**
Vulnerability to Harm or Illness	0.79	2.41 (1.20)	2.27 (1.01)	0.69
Enmeshment/Undeveloped Self	0.66	2.38 (1.01)	2.21 (0.93)	1.36
Entitlement/Grandiosity	0.65	2.20 (0.81)	2.38 (0.95)	1.83
Insufficient Self-Control/Self-Discipline	0.72	2.61 (1.08)	2.52 (0.91)	0.32
Subjugation	0.75	2.32 (0.99)	2.03 (0.87)	3.97*
Self-Sacrifice	0.78	3.38 (1.16)	3.09 (0.89)	3.25
Emotional Inhibition	0.82	2.66 (1.15)	2.33 (1.19)	3.52
Unrelenting Standards/Hypercriticalness	0.74	2.50 (0.98)	2.73 (1.06)	2.25

*$p < 0.05$. **$p < 0.01$.
SD = Standard Deviation. YSQ = Young Schema Questionnaire.

Table 3. Hierarchical multiple regression analyses

	F	*R*	R^2	*t*	β
Internalizing					
Block 1	6.61***	0.33	0.11		
Age				–0.09	–0.01
Gender				4.06	0.30***
SES				1.49	0.11
Block 2	10.85***	0.46	0.21		
Weight status				4.60	0.32***
Block 3					
Social Isolation/Alienation	21.91***	0.63	0.40	7.25	0.45***
Vulnerability to Harm/Illness	21.77***	0.67	0.45	3.60	0.24***
Externalizing					
Block 1	0.84	0.12	0.02		
Age				–0.60	–0.05
Gender				0.72	0.06
SES				1.20	0.09
Block 2	2.22	0.23	0.05		
Weight status				2.51	0.19**
Block 3					
Entitlement	6.27***	0.40	0.16	4.62	0.34***
Dependence/Incompetence	6.43***	0.44	0.19	2.50	0.20**

**$p < 0.01$. ***$p < 0.001$.
SES = socio-economic status.

tion/Alienation entered the equation first, resulting again in a significantly better prediction of internalizing problems over and above demographic variables and weight status, $R^2Change = 0.19$, $p < 0.001$. Subsequently, the schema Vulnerability to Harm/Illness entered the equation, which again led to a significantly better prediction of the dependent variable, $R^2Change = 0.04$, $p < 0.001$. The total variance in internalizing problems explained by the demographic variables, the weight status, and the schemas Social Isolation/Alienation and Vulnerability to Harm/Illness amounted to 44.6%.

The second hierarchical multiple regression analysis was conducted with the composite externalizing problem score as the dependent variable. In block 1, age, gender and SES were entered

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simultaneously. These control variables did not make a significant contribution to the model, $F(3,165) = 0.84$, $p = 0.48$. In block 2, weight status was entered, leading to a significantly better prediction of externalizing problem behaviour, $R^2Change = 0.04$, $p = 0.01$. In block 3, the schemas Entitlement and Dependence/Incompetence entered the equation successively, resulting in a significantly better prediction of externalizing problems over and above demographic variables and weight status, $R^2Change = 0.11$, $p < 0.001$ and $R^2Change = 0.03$, $p = 0.01$, respectively. The variance in externalizing problems explained by the demographic variables, weight status, and the schemas Entitlement and Dependence/Incompetence amounted to 19.2%.

DISCUSSION

The present study aimed at investigating whether Young's schema theory constitutes a comprehensive framework to understand psychopathology in youth, especially in referred obese adolescents. Although obesity is labelled as a medical condition, in referred groups, elevated levels of associated psychopathology are shown rather consistently (Zametkin et al., 2004). In this study again, about 50% of the parents reported clinically significant internalizing and externalizing symptoms in their obese adolescents. Forty-six percent of the adolescents indicated experiencing clinically significant internalizing problems and 27% reported externalizing symptoms. In general, when relevant demographic characteristics were kept constant, obese adolescents scored significantly higher for both self- and parent-reported psychological symptoms. These findings confirm our basic assumption and earlier findings on psychopathology in treatment-seeking obese youth.

In general, higher levels of dysfunctional schemas as identified by Young were demonstrated in the obese adolescents, compared with normal weight controls. Two studies revealed similar findings in referred obese adults (Anderson et al., 2006) and in overweight adolescent girls (Turner et al., 2005). Exploratory analyses on an individual schema level showed that the referred obese individuals exhibited stronger belief in self-statements related to the schemas Emotional Deprivation, Social Isolation/Alienation, Defectiveness/Shame, Failure to Achieve, Dependence/Incompetence and Subjugation. Second, a clear association of schemas and psychopathology was demonstrated. Internalizing problems were most closely related to the schemas Social Isolation/Alienation and Vulnerability to Harm/Illness, externalizing symptoms to the schemas Entitlement and Dependence/Incompetence. The schema model explained about 45% of the variance in internalizing versus 19% of the variance in externalizing problem behaviour. These findings add to the growing literature on cognitive theory in adolescent psychopathology research and provide evidence for the usefulness of Young's schematheory for studying psychosocial comorbidity in youth in general and in obese adolescents in particular.

Although the precise underlying mechanisms remain unclear, some tentative hypotheses on the origin of maladaptive schemas in obese youngsters can be drawn from literature. Within a cognitive view on psychopathology, it is assumed that maladaptive schemas primarily originate from negative early life experiences in the home environment (Beck, 1967; Beck et al., 1979). Young et al. (2003) describe the typical families of origin of individuals who strongly belief in self-statements related to the schemas Emotional Deprivation, Social Isolation/Alienation and Defectiveness/Shame as 'cold' and 'rejecting'. Some studies indeed suggest that obese youngsters are often raised in a dysfunctional home environment (Zeller & Daniels, 2004). However, not all maladaptive schemas necessarily reflect childhood experiences in the family of origin. For example, the Social Isolation/Alienation schema usually develops in later childhood or adolescence by influences from peers and the surrounding culture (Young et al., 2003). Anderson et al. (2006) suggest that the higher scores they found in the obese group on the schemas Social Isolation/Alienation, Defectiveness/Shame and Failure to Achieve might originate from negative experiences associated with the social obesity stigma. It is indeed assumed that in some individuals, the well-documented obesity stigma (Puhl & Brownell, 2001) may be a crucial factor triggering psychological problems. Based on schema descriptions by Young et al. (2003), cognitive content resulting from obesity in this point of view might spread from the belief that one is isolated and different from other people (Social Isolation/Alienation) to the belief that one is less successful than peers in areas of achievement (Failure to Achieve), a sense of shame for being defective, bad, worthless, inferior or unlovable to others (Defectiveness/Shame) and, according to the present study, the belief that one is unable to handle everyday responsibilities in a competent manner without the help from others

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(Dependence/Incompetence). These findings parallel research on self-esteem, showing that obese youngsters not only feel physically inferior to peers but also have lower general self-worth (Braet, Mervielde, & Vandereycken, 1997).

Within the eating disorder literature, overeating is considered a way of coping with negative emotions that arise from activation of dysfunctional schemas (Waller, 2000). According to Young et al. (2003), maladaptive behaviour should be thought of as a way of dealing with the schema. The author considers overeating as a typical example of 'schema avoidance'. Individuals utilizing this maladaptive coping style avoid activation of dysfunctional schemas and reflexively push emerging signs of activation by drinking excessively, taking drugs, overeating or becoming workaholic. This schema avoidance process parallels ideas from the affect regulation model in the literature on eating pathology (Grilo et al., 1994) and might explain why in some individuals psychopathology precedes obesity (Goodman & Whitaker, 2002; Stice, Presnell, Shaw, & Rohde, 2005). However, trajectories other than this emotionally induced eating are conceivable for the development of obesity out of difficult life circumstances. Cognitive diathesis-stress theories assume that a dysfunctional home environment in early childhood will lead to negative beliefs about oneself and the world. As suggested by Cooper (2005), on a more specific level, development of, for example, adequate appetite and food regulation might in these families concurrently be hindered by insensitive parental responding to the child's appetite cues. Hence, the association of obesity and psychopathology is not necessarily causal, but might be the result of overlapping though distinct pathophysiologies (McElroy, Kotwal, Malhotra, Nelson, Keck, & Nemeroff, 2004). Family characteristics relevant for childhood obesity (Baldaro, Rossi, Caterina, Codispoti, Balsamo, & Trombini, 2003; Decaluwe, Braet, Moens, & Van Vlierberghe, 2006; Epstein, Klein, & Wisniewski, 1994; Epstein, Myers, & Anderson, 1996; Zeller & Daniels, 2004; Zeller et al., 2004) are, in this respect, considered general risk factors influencing both conditions.

Nowadays, effective obesity treatment is seen as comprised of changes in food intake and increased physical activity supported by cognitive–behavioural techniques (CBT) and parental involvement; very little is known, however, on care for obese children with comorbid mental problems (Zametkin et al., 2004). Giving attention to psychopathology symptoms in both assessment and treatment of referred obese youngsters seems nevertheless essential to enhance the quality of life in these children and their families (Vila et al., 2004). Moreover, in obesity treatment programmes, practitioners are faced with dropout and relapse (Braet, Tanghe, De Bode, Franckx, & Van Winckel, 2003; Braet, Tanghe, Decaluwe, Moens, & Rosseel, 2004). It remains to be tested whether youngsters who drop out or relapse are characterized by comorbid psychosocial problems (Braet, 2006). Knowledge on the mechanisms involved in emotional and behavioural problems in obesity can create handles to assess and tackle them. In research on the usefulness of Young's theory in the eating disorders, the need to supplement standard CBT for eating disorders (Fairburn, Cooper, & Shafran, 2003) with specific therapeutic strategies to modify existing dysfunctional schemas (Young, 1999; Young et al., 2003) was stressed (Hinrichsen, Waller, & Emanuelli, 2004; Leung, Waller, & Thomas, 2000; Waller, Shah, Ohanian, & Elliott, 2001). In our opinion, the same applies to obesity treatment in a subgroup of referred children and adolescents suffering from psychological problems.

Present findings cannot be generalized to the obese population as a whole, since the sample is limited to referred obese adolescents. Moreover, one should keep in mind that even within clinical samples, the presence of psychopathology varies greatly across obese individuals (Friedman & Brownell, 1995). In future research interview-based measures known as the 'gold standard' for the measurement of psychiatric diagnoses (Costello, Egger, & Angold, 2005) can reveal additional information on comorbidity in adolescent obesity. Nevertheless, studies measuring psychopathology dimensionally will still be equally important, as it enables to include also youngsters who are impaired but undiagnosed (Angold, Costello, Farmer, Burns, & Erkanli, 1999). Moreover, the use of self-report questionnaires enables more advanced statistical testing. In future research, the precise mechanisms underlying psychosocial problems in obese youngsters should be explored, ideally in longitudinal designs. Studies should document early life environment in obese youth and examine if overeating can be triggered by activation of maladaptive schemas.

Finally, the present study offers an initial attempt to model the association of Young schemas and internalizing and externalizing symptoms in youth. In line with recent findings by Muris (2006), maladaptive schemas were clearly related to psychological symptomatology. Further research should elaborate on the usefulness of Young's

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theory to understand child and adolescent psychopathology in large samples of both clinical and non-clinical groups of youngsters with varying psychological symptoms or disorders.

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