Towards a better understanding of psychopathology in adolescents:
Cognitive vulnerability in obese and non-obese youngsters

Leen Van Vlierberghe

Promotor: Prof. Dr. C. Braet

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Chapter 1

Cognitive vulnerability and developmental psychopathology: An introduction

The overall aim of the present dissertation is to investigate cognitive vulnerability for psychopathology in adolescents. The thesis consists of eight chapters: a general introduction, six empirical studies and a general discussion. The general introduction presented in this chapter provides the reader with the theoretical background of the empirical studies. We set off by shortly highlighting some important aspects of child and adolescent psychopathology research. Subsequently, the cognitive theory on psychopathology, which has generated a vast body of empirical research on psychopathology in adults and, although to a far lesser extent, also in children and adolescents, is outlined. As four empirical studies in this dissertation focus on (cognitive vulnerability in) a specific subgroup of youngsters suffering from psychological problems, i.e. obese adolescents, the third section of this chapter provides an overview of what is currently known about (psychopathology in) childhood and adolescent obesity. Finally, at the end of the chapter, we present a summary of the empirical studies in this dissertation.

Psychopathology research in children and adolescents

In the United States, data from several epidemiological surveys in youth revealed that between 3% and 18% of children and adolescents have a psychiatric disorder, causing significant functional impairment (Costello, Egger, & Angold, 2005). Costello, Mustillo, Erkanli, Keeler and Angold (2003) prospectively followed 1420 North-American youngsters between the age of 9 and 13 years during 4 to 8 years. It was found that, when reaching the age of 16, 36.7% of the participants had met criteria for the presence of at least one psychiatric disorder on at least one of the annual assessments. In the United Kingdom, a nationally representative survey of the prevalence of child and adolescent psychiatric disorders in 10438 5 to 15 year olds, demonstrated that at least one mental disorder diagnosis was present in 9.5% of the sample (Ford, Goodman, & Meltzer, 2003; Meltzer, Gatward, Goodman, & Ford, 2003). In the Netherlands, a study in 13 to 18 year olds, revealed an overall prevalence rate of mental disorders of about 22%, the most common disorders being simple phobia, social phobia, and conduct disorder (Verhulst, van der Ende, Ferdinand, & Kasius, 1997). In conclusion: overall, there is clear evidence that a substantial amount of youngsters suffers from severe forms of psychopathology. However, epidemiological research typically reveals a large variation in estimates of the prevalence of mental disorders (Costello et al., 2005). Further, it is consistently found that only a small proportion of children suffering from severe psychological disorders, actually receives treatment (Costello et al., 2005; Zwaanswijk, Verhaak, Bensing, van der Ende, & Verhulst, 2003).

Developmental psychopathology is a discipline that was created specifically to study children and adolescents with emotional and behavioural problems from a developmental perspective (Braet & van Aken, 2006). Its enduring objective is to prevent or reduce psychopathology and alleviate the burden of suffering it brings to individuals, families and communities, while at

the same time promoting healthy behaviour and development (Masten, 2006). There is powerful evidence that most psychiatric disorders have their origin early in life: risks are increased by childhood adversities and disorders in youth often recur in adulthood (Costello et al., 2005). Hence, addressing (vulnerability for) psychopathology in children and adolescents is important to improve adult functioning and prevent the continuation of problems into the next generation (Ford et al., 2003). Recognition grows that giving young people a healthy start in life is critical for a society's well-being and takes pressure of the health care system (Braet & van Aken, 2006).

However, developmental psychopathology is a fairly young discipline (Braet & van Aken, 2006) that is challenged by several methodological and theoretical issues. In the next paragraph, we will focus on two of them, because of their relevance for this dissertation. The first is that methodologically, one can question how psychopathology should actually be defined. The second is that theoretically, it remains to be tested which theory is most appropriate to understand emotional and behavioural problems in children and adolescents. We will consider whether the cognitive model on psychopathology is a relevant theory to investigate psychological problems in youngsters.

Assessment of psychopathology: A multi-method multi-informant approach

One of the reasons why prevalence estimates of psychopathology vary considerably across studies is that, in assessing psychological problems, studies differ concerning the informant(s) included and the assessment method used.

Psychopathology research in children and adolescents is typically characterised by low agreement of informants. In a historical review, Achenbach, McConaughy and Howell (1987) showed that the mean correlation of children's and parental report of emotional and behavioural problems is no higher than .25. Consequently, differing conclusions on the presence of psychopathology will be drawn, depending on the informant(s) one relies on.

Therefore, both in research as well as in clinical practice, the inclusion of different informants is considered the gold standard for the assessment of psychopathology in youth (Achenbach et al., 1987). In the present dissertation, adolescents as well as their parents will be questioned on the presence of psychopathology.

Among researchers, the use of self-report questionnaires to assess psychopathology is attractive as such instruments are quick, easy and inexpensive to administer, score and interpret (Fristad, Emery, & Beck, 1997)[1]. Each questionnaire item refers to a specific symptom and the respondent is asked to what extent or how frequent he experiences the symptom in question. Subsequently, a total symptom score is obtained by summing all individual item scores. Hence, self-report questionnaires measure *symptom severity* and each individual is placed along a continuum of gradually increasing symptomatology. Therefore, this assessment method is also referred to as the *dimensional* psychopathology approach. Probably most widespread is the Achenbach System of Empirically Based Assessment (ASEBA: Achenbach & McConaughy, 2003) of which the 'school-aged forms' (Achenbach & Rescorla, 2001), i.e., the Child Behavior Checklist (CBCL), the Youth Self Report (YSR) and the Teacher Report Form (TRF) are of special relevance for developmental psychopathology research. The ASEBA questionnaires are referred to as 'broad band' self-report instruments since they question about all main emotional and behavioural symptoms that can be expected in children and adolescents. In terms of output, both general psychopathology dimensions ('internalizing symptomatology', 'externalizing symptomatology' and 'total problem behaviour' score) as well as more specific subscale scores (e.g.: 'somatic complaints', 'attention problems', 'rule-breaking behaviour') are generated. 'Small band' questionnaires, such as

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[1]   For the same reasons, the use of self-report questionnaires is attractive for clinicians also. However, the discussion on different methods to assess psychopathology will be outlined from a research perspective.

the Children's Depression Inventory (Kovacs, 1992), The Spence Children's Anxiety Scale (Spence, 1998) and the Eating Disorder Examination – Questionnaire (Fairburn & Beglin, 1994) focus on one specific form of emotional disturbance.

However, given their ease of use, self-report questionnaires are often also applied to assess the presence of a specific psychological *disorder*. Subjects with a total score above a previously defined cut-off criterion, are presumed to suffer from the disorder under study. This way, many false-positive diagnoses are produced[2]. This is not surprising, given that questionnaires assess current symptomatology, whereas the presence of a disorder requires a certain duration of the symptom constellation as well as a severe interference with daily functioning. Therefore, clinical interviews are nowadays considered the gold standard to assess psychological *disorders* (Costello et al., 2005). Some cover the majority of child and adolescent disorders in one interview, e.g.: the Structured Clinical Interview for DSM-IV – Child Edition (KID-SCID: Hien et al., 1994), whereas others focus on a specific type of disorder, e.g.: the Child version of the Eating Disorder Examination (ChEDE: Bryant-Waugh, Cooper, Taylor, & Lask, 1996). Note that another perspective on psychopathology is taken here, i.e., the *categorical* psychopathology approach: a psychological disorder can be present or absent, but not somewhere in between. Without a doubt, the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR: American Psychiatric Association, 2000) is the most famous and widely used

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[2] Consequently, when this assessment method is used in epidemiological research, an overestimation of prevalence rates can be expected. In clinical practice, self-report questionnaires are considered screening tools as they identify subjects 'at risk' (because of exceeding the cut-off criterion) for a disorder. However, given the large number of false-positive diagnoses, a more thorough assessment is subsequently required to confirm the presence of a disorder.

categorical taxonomy of psychopathology. Most clinical interviews are based on the diagnostic criteria as outlined in the DSM[3].

For an in-depth discussion of differences and similarities between as well as the benefits and disadvantages of dimensional and categorical perspectives on child and adolescent psychopathology, we refer to Grietens (2008). According to this author, the integrative use of both approaches enhances the quality of assessment. One could indeed argue that psychopathology includes both categorical and dimensional aspects. Hence, in order to obtain 'a full picture', the combination of methods can only be applauded. For the researcher however, there are also some practical considerations involved when choosing an adequate assessment method. For example, the administration of structured clinical interviews is very time-consuming (see also the discussion in chapter 2). Furthermore, dimensional assessment yields continuous data, which enables more advanced forms of statistical testing as compared with categorical outcome variables. To conclude, in the present dissertation, psychopathology will be operationalized both dimensionally and categorically.

Beck's original cognitive psychopathology model

From the 60's onwards, Beck (A. T. Beck, 1967; A. T. Beck, Rush, Shaw, & Emery, 1979) developed his cognitive theory of adult depression. Later on, the cognitive model was also extended to other forms of psychopathology, such as anxiety and personality disorders (A. T. Beck, 1976; A. T. Beck, Emery, & Greenberg, 1985; A. T. Beck & Freeman, 1990). Beck's theory adopts a

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[3]   Confusion might arise on the status of the ASEBA DSM-oriented scales (Achenbach & Rescorla, 2001) that were used in chapter 6. These scales do generate a continuous outcome and therefore reflect the dimensional approach. They should be considered an attempt of Achenbach and colleagues to install a better integration of the dimensional and the categorical system (Grietens, 2008). What we deal with here is another screening tool, that is readily 'translated' in DSM terms. In this regard, the DSM scales are not all that different from small band questionnaires such as the CDI or the SCAS.

'schema-based information processing paradigm' of human functioning (Clark, Beck, & Alford, 1999). A schema can be defined as a stored body of knowledge which interacts with the encoding, comprehension and/or retrieval of new information within its domain, by guiding attention, expectancies, interpretation and memory search (J. M. G. Williams, Watts, MacLeod, & Mathews, 1997). For humans to survive, it is essential that new environmental information is organized, processed and stored in a meaningful way. Schemas aid to that: they act as mental filters, guiding the way in which individuals interpret new information. As such, schemas facilitate information processing and have an adaptive function. They are built up on the basis of earlier experiences and remain latent until triggered by situations that remind an individual of the knowledge stored in the schema. They can be fairly concrete, e.g.: when representing knowledge on a distinct object such as a chair, or rather abstract, e.g. for the representation of 'the self' or 'the others' (Clark et al., 1999).

The cognitive model presupposes that people's emotions and behaviour are influenced by their *perceptions* of events: it is the *interpretation* of the situation and not the situation in itself that determines how people feel (J. S. Beck, 1995), and this interpretation is assumed to be schema-guided. As human information processing is limited in capacity, attention will selectively be drawn to specific aspects of a given situation ('attentional bias') and only these aspects of information will be further encoded and elaborated ('interpretation bias') and retrieved later on ('memory bias'). It can thus be concluded that schemas play an important role in explaining how people think, feel and behave. Therefore, the cognitive model refers also to thoughts, emotions and behaviour as the *products* of the information processing system (Clark et al., 1999). As schemas are abstract theoretical constructs and hence not directly observable, we have to rely on these cognitive products to make inferences on the content of the knowledge stored in schemas (Bögels & Van Oppen, 1999).

Concerning thoughts, three hierarchical levels can be distinguished (see: Arntz & Bögels, 2000; J. S. Beck, 1995; Bögels & Van Oppen, 1999). Most on the surface, there are so-called automatic thoughts: the actual words or images that go through one's mind in a specific situation. Automatic thoughts are not the result of deliberation or reasoning, they seem to pop up automatically in a given situation (e.g.: 'That girl doesn't like me') and one might be hardly aware of them. On the most fundamental level, there are so-called core beliefs: basic ideas that people hold about themselves (e.g.: 'I'm unworthy'), the others ('Other people are critical') and the world (e.g.: 'The world is a dangerous place') and which they regard upon as 'the absolute truth' or 'just the way things are'. In contrast with automatic thoughts, core beliefs are global, rigid and overgeneralized. Finally, there is an intermediate class of beliefs, that includes attitudes (e.g.: 'It is terrible to be incompetent'), rules (e.g.: 'I must work as hard as I can all the time') and assumptions. These assumptions can be further distinguished into conditional (e.g. 'If I exhibit my emotions, others will turn away from me') and instrumental or strategic assumptions (e.g.: 'Plan everything carefully in advance').

Core beliefs are sometimes also denoted as basic assumptions. It is assumed that beliefs on a more fundamental level influence those on a more superficial level. In a specific situation, emotions and behaviour are supposed to be reactive to the activated automatic thoughts. A schematic representation of this cognitive model is represented in Figure 1. It should be noted that throughout the literature, most authors have used the notion of schema when actually referring to core beliefs. In fact, the latter term is not used very often. As outlined above, Beck differentiates the two by suggesting that schemas are cognitive structures within the mind, the specific content of which are core beliefs (J. S. Beck, 1995). Nevertheless, in line with the current terminology in the empirical literature, we will use the term 'schema' instead of the notions 'core belief' or 'basic assumption' throughout this dissertation.

For most of their lives, most people maintain relatively positive schemas (J. S. Beck, 1995). Negative schemas are labeled 'dysfunctional'[4] or 'maladaptive' for they make people vulnerable to think, feel and act negatively in a given situation (Bögels & Van Oppen, 1999). Given cognitive theory's selective processing hypothesis (see: Clark et al., 1999; J. B. W. Williams et al., 1992), one can easily understand how the presence of negative schemas (cognitive content) will filter and guide selective processing of negative information (cognitive processing). Hence, negative schemas are self-fulfilling: time after time the individual sees the negative schemas become realized. Furthermore, the cognitive psychopathology model proposes that this information processing in turn leads to negative automatic thoughts as well as negative mood and maladaptive behaviour (J. S. Beck, 1995). Hence, it should not surprise that negative schemas are also referred to as 'cognitive vulnerability factors' or 'diatheses' for the development of psychopathology. With respect to negative schemas, cognitive theory assumes that the situations activating latent schemas are not necessarily schema-relevant: the experience of stress per se might be a sufficient condition (A. T. Beck, 1976). This component of cognitive theory is also referred to as the diathesis-stress hypothesis (Clark et al., 1999).

Cognitive theory approaches emotional disturbance as well as the underlying cognitive distortions dimensionally (Clark et al., 1999). Hence, it is assumed that maladaptive schemas are present in each individual but to a larger extent in individuals with more severe psychological problems. Beck outlined a taxonomy of negative schemas in which he distinguishes between 'helpless schemas' (e.g.: 'I am inadequate', 'I am out of control') and 'unlovable schemas' (e.g.: 'I am unattractive', 'I am bound to be abandoned') (see: J. S. Beck, 1995; Clark et al., 1999). Some individuals have schemas that fall into one category,

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4   Dysfunctional schemas are almost always negative, unless the patient is manic or hypomanic, has a narcistic personality disorder or is a substance abuser (J. S. Beck, 1995).

others have schemas in both categories. Further, Beck presumes that each type of emotional disturbance is related to a unique cognitive profile characterised by specific cognitive content (A. T. Beck, 1976). In depression, the predominant cognitive theme is assumed to be about personal and significant loss or deprivation (Clark et al., 1999). The primary beliefs in anxiety would be about physical or psychological threat and the individual's appraisal of (in)capacity for coping with danger and compensating for his/her vulnerability (A. T. Beck et al., 1985). In anger, the perception of a transgression to one's personal domain and the individual's appraisal of (in)capability to sustain, neutralize or repulse the assault are supposed to be central (A. T. Beck, 1976). Perceived personal assaults include restrictions or frustration of needs, which are interpreted as violation of rights.

In empirical research on the cognitive psychopathology model, roughly two research traditions can be discerned (see: Kindt & Arntz, 1999). Both traditions share the basic assumption that dysfunctional schemas are at the bottom of development and maintenance of emotional disorders. However, they have a very different opinion on whether cognitive content can be subject of introspection and is hence suitable for self-report. This controversy is reflected in the methodology applied. Given the differences on the precise subject under study and the methodology used, both research traditions seem to complement rather than compete with each other. The present dissertation is integrally situated within the research tradition that is discussed firstly.

The 'therapeutically oriented research tradition' is rooted in Beck's original ideas and hypothesizes that individuals can consciously reflect and report on dysfunctional thoughts[5]. According to Beck, schemas can be inferred from behaviour or assessed through interview and history taking (A. T. Beck &

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[5]   Obviously, there's no point in cognitive therapy when one presumes that individuals cannot express their negative schemas or when one assumes that negative schemas are unchangeable.

Freeman, 1990). Hence, in empirical research, participants are directly questioned on cognitive content by means of self-report questionnaires. Subjects are asked to report on thoughts they have in a given situation, or rate the frequency of occurrence or the extent to which they belief in specific cognitions. The 'experimentally oriented research tradition' has its roots in cognitive psychological research on 'normal' information processing and assumes that neither cognitive content nor cognitive processing are suitable for introspective report. In youth, this has mainly led to the investigation of attention, interpretation and memory bias via 'performance based measures' (Frick, 2000; Frick & Loney, 2000; Garber & Kaminski, 2000; Vasey & Lonigan, 2000) in youngsters with conduct (see e.g.: Crick & Dodge, 1994), anxiety (see e.g.: Vasey & MacLeod, 2001) and mood (see e.g.: Garber & Kaminski, 2000) disorders (for a thorough discussion on this research tradition in children and adolescents, see: Bijttebier, Vasey, & Braet, 2003; Vasey, Dalgleish, & Silverman, 2003).

        Cognitive theory inspired the development of cognitive therapy for Axis-I disorders. Cognitive therapists work at the dual level of the symptom structure (manifest problems) and the underlying schemas (A. T. Beck & Freeman, 1990). At the moment, the cognitive component is an essential aspect of all cognitive behavioural treatment (CBT) programmes. CBT nowadays sets the tone for treatment of most Axis-I psychological disorders, in adults as well as in children and adolescents (see e.g.: Chambless & Ollendick, 2001).

        In Axis-I disorders, dysfunctional schemas are presumed to be activated by stressors and consequently temporarily displace the continuing information processing guided by more positive or adaptive schemas. However, some people suffer from Axis-II pathology (personality disorders). Maladaptive schemas in individuals suffering from Axis-II disorders resemble those that are activated in Axis-I pathology, but they are operative on a more continuous basis in information processing: they are evoked across many more situations, have a

compulsive quality, are more overgeneralized, inflexible and imperative, are less easy to control and very resistant to change (see: A. T. Beck & Freeman, 1990). Some patients with a personality disorder may have almost continuously activated maladaptive schemas (J. S. Beck, 1995). Further, these patients typically have fewer positive schemas and they have developed a multitude of negative schemas that interconnect, supporting each other in a network (A. T. Beck & Freeman, 1990). Therefore, Beck considers the schematic work to be at the heart of psychotherapy with personality disordered patients. In sum, one could state that individuals with personality disorders differ from people suffering from Axis-I pathology with respect to the number and the qualities of their schemas but not necessarily in terms of the cognitive content that is represented in the schemas. To explain why cognition and emotion in personality disorder patients deviate from those of other people, Beck (A. T. Beck & Freeman, 1990) refers to a nature-nurture interaction, in which he predominantly stresses the nature component (e.g. p29: 'a patient predisposed by nature to overreact to the more commonplace kinds of rejection in childhood,…').

        To conclude, at the moment, cognitive theory seems to provide a very interesting model to investigate psychopathology. However, most hypotheses are still under study (Clark et al., 1999) and although the schema concept is attractive, it definitely needs further exploration. In this regard, Young's recent cognitive schema conceptualization, which will be discussed in the next paragraph, is of particular interest.

Young's schema theory

        Young's cognitive model (Young, 1999; Young & Klosko, 1994; Young, Klosko, & Weishaar, 2003) stems directly from his clinical practice with adults. Young elaborated the schema theory because of a great dissatisfaction with 'classic' CBT for the treatment of those individuals with entrenched, chronic psychological disorders, that is: the so-called 'difficult-to-treat patients'.

Among these are patients with full-blown personality disorders (Axis-II pathology), but also individuals with what Young refers to as 'characterological issues' that underlie their (chronic) Axis-I disorders. Young's theoretical (schema theory) and treatment (schema therapy) model incorporates concepts and techniques from, among others, Beck's traditional cognitive formulation as outlined in the previous section, but also from attachment theory and psychoanalysis. Central to the model is the dysfunctional schema concept. Young defines a maladaptive schema as 'a broad pervasive theme or pattern comprised of memories, emotions, cognitions and bodily sensations regarding oneself and one's relationships with others, developed during childhood or adolescence[6], elaborated throughout one's lifetime and dysfunctional to a significant degree'.

In his theory, Young put great emphasis on the origin of schemas. He hypothesized that dysfunctional schemas result from unmet core emotional needs in childhood[7]. He postulated five universal core emotional needs: (1) the need for secure attachment to others (i.e., the need for safety, stability, nurturance and acceptance); (2) the need for autonomy, competence and a sense of identity; (3) the need for realistic limits and self-control; (4) the need for spontaneity and play; and (5) the need for freedom to express valid needs and emotions. Further, he presumed that different types of early life experiences may lead to a frustration of these needs. These experiences include traumatisation or a more chronic form of frustration of needs, for example because the child's environment is missing important aspects such as stability, understanding or

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[6]   Thus, Young presumes that schemas develop during childhood and adolescence. Hence, when in the next paragraph, we refer to 'children' and 'childhood' in talking about the origin of schemas, these terms most certainly also include 'adolescents' and 'adolescence'.

[7]   Given that schemas result from frustration of core emotional needs in childhood, Young labels them 'Early Maladaptive Schemas' (EMS). In Beck's terminology, EMS are actually basis assumptions or core beliefs. However, as noted, throughout this dissertation, we will consistently use just the term 'schemas'.

love, or apparently the exact opposite or because the parents provide the child with too much of what, in moderation, is healthy for a child (e.g.: severe forms of overprotection).

From this overview, it might be clear that Young considers (repeated) negative childhood experiences with the (primary) caregiver(s) as the basic origin of maladaptive schemas. He presumes that during childhood and adolescence, schemas are reality-based representations of the child's environment. However, given the specific characteristics of maladaptive schemas outlined in the discussion of Beck's original model, individuals tend to perpetuate maladaptive schemas during later life, even within a 'healthy' environment. Schemas can be triggered by life-events that individuals *perceive* as similar to the traumatic experiences of their childhood[8], leading to strong negative emotions, negative thoughts and maladaptive behaviour. At that very moment, schemas are dysfunctional as they tend to recreate in later life the harmful childhood conditions, which may ultimately lead to the development of psychological problems. Two comments need to be made here. First of all, Young does acknowledge that not all maladaptive schemas necessarily reflect childhood experiences in the family of origin (see footnote 11 in this chapter and see chapter 5). However, he postulates that those schemas that are rooted in early life, are most severe, pervasive and powerful. Secondly, Young stresses that the

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[8] Obviously, what we deal with here, is Young's formulation of cognitive theory's diathesis-stress component. One could conclude that Young thus assumes that only life-events that are closely linked with the experienced childhood adversity can trigger the maladaptive schemas an individual has consequently developed. However, this conclusions seems premature. In this regard, Young's formulation of cognitive theory's dimensionality concept is relevant: he assumes that, the more severe the schema, the greater the number of situations that activate it. Young gives the following example: in an individual with a very severe 'Defectiveness/Shame schema' (cf. infra), contact with almost anyone will activate this schema, whereas in subjects with a 'milder' Defectiveness/Shame schema this will for example only be the case when confronted with demanding authority figures. It should be noted that, although Young acknowledges cognitive theory's diathesis-stress component, he does not pay much attention to it in outlining his theory.

innate emotional temperament of the child interacts to a significant degree with adverse early life circumstances in the development of schemas.

On the basis of these assumptions, we postulate that maladaptive schemas must already exist in youngsters and that they need to be investigated if one wants to understand psychopathology in children and adolescents. And so, the study of maladaptive schemas in youth will be a central aim of the present dissertation. Young defined a subset of 18 schemas that are different as regards cognitive content. Each of these 18 schemas is grouped within one of the five core emotional needs listed above. The schemas are assumed to develop due to a frustration of that specific need. The five needs are referred to as 'schema domains'. Hence, the schema domains tell us something about the type of frustration an individual has experienced. To assess the schemas he distinguished, Young developed the Young Schema Questionnaire (YSQ: Young & Brown, 1990) of which both a long (YSQ-LF; 205 items) and a short form (YSQ-SF; 75 items) exist. The YSQ-SF is comprised of the five highest loading items for each schema in the first factor analysis that was conducted on the YSQ-LF (Schmidt, Joiner, Young, & Telch, 1995). In chapter 6, Table 1 provides an overview and a description of the different schemas and domains outlined by Young as assessed with the YSQ-SF[9]. The schemas are listed, grouped within the schema domains they are presumed to belong to. Further, for each of the five schema domains, a general description of the cognitive content of schemas

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[9]   The attentive reader will notice that the YSQ-SF assesses 15 and not 18 maladaptive schemas. The schemas depicted in chapter 6 (Table 1) are those Young had identified when the YSQ was constructed. Later on, however, he supplemented his taxonomy with three additional maladaptive schemas, i.e., Negativity/Pessimism, Punitiveness and Approval-Seeking/Recognition-Seeking. At the moment, a new version of the YSQ is created in which these three schemas are also adopted. However, when the empirical studies reported on in the present dissertation were conducted, this new version was not available yet. So far, no empirical studies were reported that used the 18-schema YSQ. It should also be noted that the YSQ-LF assesses 16 and not 15 maladaptive schemas. The reason why one schema (i.e., the Social Undesirability schema) was dropped when the YSQ-SF was composed out of the YSQ-LF, is detailed in the introduction of chapter 6.

belonging to that domain is given. Finally, an exemplary YSQ-item for each schema is provided. Further, Young also developed an instrument to assess the parental origins of each schema, i.e., the Young Parenting Inventory (YPI: Young, 1994), for each parent separately. Table 1 in chapter 7 supplements the overview of chapter 6 with, per schema domain, a description of the typical parenting style in the family of origin of individuals suffering from maladaptive schemas within that domain, and an exemplary item of the YPI-Father version (YPI-Father[10]).

     As one might have noticed, Young's schema definition does not incorporate behaviour. Young presumes that maladaptive behaviour, and hence many forms of psychopathology, are part of the *response* to a schema, a way of 'dealing' with the schema. Those coping responses are driven by the activation of schemas, but are not part of them. Young distinguished three different maladaptive coping styles. Again, a child is presumed to develop these early in life to adapt to maladaptive schemas, so that the intense emotions evoked by their activation do not have to be experienced. Schema *surrender* means that an individual yields to a schema: one accepts that the schema is true. Once a schema is activated, the person is directly confronted with the associated emotions. When utilizing schema *avoidance*, an individual tries to arrange his life in such a way that the schema is never activated: he acts as if the schema does not exist, avoids thinking about it and reflexively pushes down emerging signs of schema activation. How such avoidant coping may concretely translate into maladaptive behaviour is illustrated in the discussion of chapter 5. When an individual *overcompensate*s, he actively fights the schema by thinking,

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[10] The YPI was developed four years after the YSQ. Consequently, in the YPI, the three additional schemas mentioned above were already adopted. Hence, Table 1 in chapter 7 gives a more complete overview of Young's schema taxonomy. However, the attentive reader will notice that the YPI assesses 17 and not 18 schemas. The Social Isolation/Alienation schema is not included in the YPI, as according to Young, this is a typical example of a schema that might develop later in life, in contact with peers or the surrounding culture.

behaving, and relating to others as though the opposite of the schema were true. For example, someone with a Defectiveness/Shame or a Failure schema acts as if he suffers from an Unrelenting Standards/Hypercriticalness schema. To a certain extent, schema overcompensation can be considered 'healthy'. This is the case as long as the behaviour is proportionate to the situation, takes into account the feelings of others, etc. However, according to Young, 'overcompensators' typically get locked into counteracting: their behaviour is usually excessive, insensitive or unproductive. An illustrative example might be what is generally referred to as 'masked depression' in youngsters with externalizing problem behaviour (Ben-Amos, 1992) (see also chapter 7).

Although Young's theory stems directly from clinical practice, it has been the subject of many empirical studies in adults. These studies have mainly focused on the psychometric properties of the YSQ-LF and the YSQ-SF and on identifying the specific cognitive content associated with different psychological symptoms and disorders[11]. To the best of our knowledge, so far only four studies were conducted in youngsters (Cooper, Rose, & Turner, 2005; Lumley & Harkness, 2007; Muris, 2006; Turner, Rose, & Cooper, 2005). In chapter 6, an overview of adult and adolescent studies and a discussion of their main conclusions and shortcomings is given. Surprisingly, there seems to be a

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[11]   At first glance, Young's schema taxonomy indeed creates an excellent opportunity to test the cognitive content-specificity hypothesis. Young is very straightforward in assuming specific associations between childhood experiences and schemas. However, he is much less clear on whether he also assumes specific associations of schemas and psychological symptoms/disorders, that is: the 'traditional' idea of cognitive content-specificity. As discussed, Young more or less considers psychopathology a way of coping with activated schemas. He states that coping styles are not as stable as schemas, as they are person-, situation- and schema-specific and may vary across an individual's stage of life. Furthermore, one coping style can represent many varying forms of psychopathology. In sum, Young does not formulate any concrete hypothesis on an association of a specific schema and a specific psychological disorder. Besides these theoretical considerations, there are also some methodological problems associated with testing the tenability of the content-specificity hypothesis on the basis of Young's taxonomy. These are dealt with in chapter 6.

relatively limited research interest (e.g.: Lumley & Harkness, 2007; Meyer & Gillings, 2004; Muris, 2006; Shah & Waller, 2000; Turner et al., 2005) in Young's framework to investigate (content-specificity in) the association of early parental experiences and cognitive vulnerability, and how they relate to psychopathology. As will be outlined in chapter 7, at the moment there is just one (adult) study that has used the YPI to investigate the association of childhood parental experiences and maladaptive schemas as outlined by Young (Sheffield, Waller, Emanuelli, Murray, & Meyer, 2005).

Concluding remarks and aims of the present dissertation: part 1

Obviously, Beck and Young's cognitive models share their major tenets, i.e., the schema definition, the dimensionality of the schema concept, the selective processing hypothesis and the self-defeating character of schemas, the diathesis-stress activation of schemas and the assumption that maladaptive schemas are associated with psychopathology. In our opinion, the added theoretical value of Young's schema theory is threefold. First of all, the distinction of 18 schemas grouped within five schema domains, provides us with a more diversified taxonomy of cognitive vulnerability as compared with Beck's summary distinction between 'helpless schemas' and 'unlovable schemas'. Secondly, Beck has always remained vague on the origin of schemas, whereas Young concretely postulates a (content-specific) association between maladaptive parenting practices on the one hand and dysfunctional schemas on the other hand. Finally, Young's distinction between three different coping styles might improve our understanding of the behavioural consequences of schema activation. For all these reasons, we believe that empirical research on the basis of Young's framework might provide us with a better understanding of cognitive vulnerability, its origins and its association with varying forms of psychopathology in adults, but most probably also in younger populations.

However, one question remains: given that Young's theory was formulated to understand Axis-II disorders and that personality disorders are not to be diagnosed before the age of 18 (see DSM-IV-TR: APA, 2000), does it actually make sense to empirically address Young's theory in youth? We think so. First of all, as outlined above, Young considers schema therapy just as much suitable in individuals with 'characterological issues' that underlie their chronic Axis-I disorders. Also in youngsters, relapse rates for various psychological disorders are fairly high, for example: longitudinal studies of clinical as well as epidemiological samples have consistently found that depression in youngsters has a probability of recurrence of 40% by 2 years and 70% by 5 years (Birmaher et al., 1996). Moreover, as stated earlier, Axis-I disorders manifesting themselves in the early years often recur in adulthood (Costello et al., 2005). Hence, one could assume that more chronic variants of Axis-I disorders exist in youth already and persist into adulthood. Secondly, increasing evidence suggests that already in early years of life, childhood personality disorder features are demonstrable (De Clercq & De Fruyt, 2007). In sum, from a developmental psychopathology perspective, the study of adolescent vulnerability for Axis-I disorders in youth and adulthood, and personality disorders in adulthood can only be applauded. In this regard, Young's concrete hypotheses on the parenting origins of cognitive vulnerability are particularly interesting. Thirdly, as outlined earlier, maladaptive schemas in people suffering from Axis-II pathology differ from those seen in Axis-I disorders regarding their number and qualities but not necessarily regarding cognitive content. Finally, Young's schema taxonomy reflects common (interpersonal) themes in people's life (Arntz & Bögels, 2000) that are presumed to be rooted in basic human needs, which makes the model suitable to conceptualize vulnerability in individuals without personality disorders also.

The present dissertation aims to investigate cognitive vulnerability in adolescents on the basis of Young's schema theory. Given that very few studies

in younger populations have incorporated Young's psychopathology model, this thesis actually takes the form of a preliminary evaluation of the utility of Young's theory in adolescents. To this end, we adapted the YSQ and the YPI-Father and YPI-Mother[12] for use in youngsters. The YSQ is used in chapters 4, 5 and 6, the YPI-Father and the YPI-Mother are used in chapter 7. How the adaptation of the instruments was realized, is described in detail in these chapters. In chapters 4 and 5, the utility of the YSQ to understand individual differences in psychological symptomatology in adolescents is explored. The central aim of chapter 6 is to address the reliability and validity of the YSQ in youth as well as the tenability of some of cognitive theory's main assumptions within Young's framework, i.e. the dimensionality of the schema concept, the overall positive association of maladaptive schemas and psychopathology and the cognitive content-specificity hypothesis. The central aim of chapter 7 is to investigate Young's assumptions on the parenting origins of maladaptive schemas and includes another test of the content-specificity hypothesis.

Psychopathology in obese children and adolescents

As will be shown throughout the next section, pediatric obesity is an increasingly prevalent and serious condition that is currently acknowledged as a major public health issue. Besides considerable medical consequences, there is evidence for associated psychological problems in a substantial amount of obese youngsters, especially in referred groups. A psychological perspective reveals more psychosocial aspects than one would expect: obese youngsters suffering from psychopathology seem to be characterized by negative familial experiences also. Hence, the contemporary view that psychopathology in obese individuals is a mere consequence of being obese, should possibly be nuanced. A broader conceptualization of psychopathology in obese youngsters seems warranted.

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[12] YPI-Mother = Young Parenting Inventory – Mother Version

Young's cognitive model might provide such comprehensive framework, given its focus on familial adversity in explaining subsequent psychological problems. Choosing Young's schema theory as a candidate framework is also inspired by the recent introduction of Young's model in the adult eating disorder literature (see e.g.: Waller, 2003; Waller, Ohanian, Meyer, & Osman, 2000; Waller, Shah, Ohanian, & Elliott, 2001). In the following paragraphs, we will shortly discuss what is currently known on (psychopathology in) obese children and adolescents and then outline our research questions on this matter.

Obesity in children and adolescents: Definition, assessment, prevalence, medical consequences and etiology

Obesity is defined as a condition where a pathological excess of body fat is present in an individual (Wabitsch, 2000). The Body Mass Index (BMI) is the most commonly used and widely accepted measure of obesity. The BMI is calculated by dividing an individual's weight (in kilogrammes) by his/her squared height (in meters). A BMI equal to or above 25 indicates overweight and a BMI equal to or above 30 is the cut-off criterion for obesity (World Health Organization, 1998). Note that in the latter definition, obesity is in fact considered a state of severe overweight. This is however not quite correct. Trojano and Flegal (1998; 1999) provide an interesting discussion on this matter in light of its implications for research on obesity in childhood and adolescence, which will be shortly summarized here. Whereas obesity indicates excess adipose tissue, overweight actually indicates excess weight for height, regardless of the composition of the weight. However, since precise assessment of the amount of body fat involves complex, time-consuming and expensive procedures, weight-for height measures like BMI are often used as an indicator of obesity. For adults, this indirect assessment can actually serve as a proxy for degree of adiposity as BMI and direct measures of fat tissue correlate fairly high. The abovementioned BMI cut-off criteria are 'risk-based': they have been

determined on the basis of longevity, morbidity and mortality associations with various levels of weight. However, in youngsters the use of the BMI is problematic. Because of changes in body composition (proportion of lean and fat tissue) during growth, the association of weight-for-height measures and adiposity during childhood and adolescence is largely dependent of age and gender. Also, the use of one single BMI cut-off value to define overweight and obesity in youngsters would not work. Firstly, mean BMI changes dramatically with age during childhood and adolescence, decreasing in young children and increasing with age from 6 years onwards. Secondly, unlike for adults, there is not much evidence for a system that classifies children and adolescents as overweight or obese on the basis of outcome variables (e.g.: childhood and adult morbidity, adult mortality and adult obesity).

In children and adolescents, Jelelian and Saelens (1999) and Goldfield, Raynor and Epstein (2002) therefore recommend working with the adjusted BMI, which is calculated as follows: [(Actual BMI / 50th percentile of BMI for age and gender) x 100]. The 50th percentile for age and gender is based on norm data from a reference group. Throughout this dissertation, the adjusted BMI will be used. We consider an adjusted BMI of 120% as the criterion for overweight and 140% as the cut-off value for obesity (Van Winckel & Van Mil, 2001). The calculation of so-called BMI z-scores is a comparable way of taking into account age and gender when defining obesity in youth. A BMI z-score is calculated as follows: [(Actual BMI – mean BMI) / standard deviation of BMI], where the mean BMI and the standard deviation of the BMI are based on a reference population of the same age and gender as the subject. The United States' Centers for Disease Control and Prevention (CDC) promotes the use of BMI z-scores

and recently provided norm data that are currently seen as the reference standard in the US (Ogden, Kuczmarski et al., 2002)[13].

In the absence of outcome-based criteria to classify children and adolescents as overweight and obese, a statistical approach with arbitrary chosen percentile values is generally used (Troiano & Flegal, 1998, 1999). Common percentile choices for cut-off values include the 85th, 90th or 95th percentile. However, this approach is problematic for several reasons. Firstly, studies on obesity in pediatric samples consequently diverge regarding the criteria used and the terminology applied. For example, European researchers classify overweight as at or above 85th percentile and obesity as at or above 95th percentile of BMI for age and gender (Flodmark, Lissau, Moreno, Pietrobelli, & Widhalm, 2004). In accordance with other US experts in the field (Barlow & Dietz, 1998; Himes & Dietz, 1994), the CDC on the other hand recently defined overweight as at or above the 95th percentile of BMI for age and gender (BMI z-score of 1.65) and 'at risk for overweight' as between 85th to 95th percentile for age and gender (BMI z-score between 1 and 1.65)[14] (Ogden, Kuczmarski et al., 2002). Secondly, by using percentiles, the prevalence of overweight and obesity is each time set to a fixed proportion for all ages of both sexes (Bellizzi & Dietz, 1999), e.g. 10% of the CDC reference population is at risk for overweight and 5% is overweight. Consequently, the study of (secular trends in) the epidemiology of overweight and obesity in youth becomes virtually impossible. Finally, cut-off percentiles are always dependent on the reference population, and norm data usually have limited representativeness. To address these issues, the following approach was proposed (Bellizzi & Dietz, 1999; Cole, Bellizzi, Flegal, & Dietz, 2000). As

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[13] For the purpose of this dissertation, we considered it more appropriate to use European reference data (from the Netherlands) (Fredriks, van Buuren, Wit, & Verloove-Vanhorick, 2000).

[14] Consequently, in many *recent American* publications on pediatric samples the term obesity is no longer used. However, in this dissertation the terms 'overweight' and 'obesity' will be used interchangeably to describe a condition of excess weight, which actually reflects the terminology use in the current literature.

children tend to retain the same percentile ranking as they become older, adult cut-offs for overweight and obesity (BMI equals 25 and 30 respectively) at age 18 years could be drawn back to the corresponding centiles for both sexes at each age. These age- and gender-specific centiles could subsequently be used as cut-off criteria for overweight and obesity in children and adolescents. The establishment of a reference population that is widely representative for the world's population by pooling data from several countries will thereby be crucial.

Worldwide, the prevalence of overweight and obesity has increased dramatically during the past few decades, in adults as well as in children and adolescents (Jackson-Leach & Lobstein, 2006; Knai, Suhrcke, & Lobstein, 2007; Ogden, Flegal, Carroll, & Johnson, 2002; Schokker, Visscher, Nooyens, van Baak, & Seidell, 2007; Wyatt, Winters, & Dubbert, 2006). Although the highest rates are found in developed countries, the prevalence is also increasing in many developing countries (Martorell, Khan, Hughes, & Grummer-Strawn, 2000; Popkin & Doak, 1998). The combined prevalence of overweight and obesity now exceeds 60% among US adults (Wyatt et al., 2006) and varies between 35% (Italian women) and 80% (Slovakian men and women) in the different European Union countries (Knai et al., 2007). As mentioned, the use of arbitrary statistical cut-off criteria seriously hampers the estimation of overall prevalence rates for overweight and obesity in children and adolescents. In Europe, mean prevalence rates for overweight[15] and obesity in children and adolescents are estimated at 23.3% and 7.1% respectively[16] (Jackson-Leach & Lobstein, 2006). In Belgium, a fairly recent study revealed an overweight and obesity prevalence rate of

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[15] The estimated prevalence rate of overweight youngsters is quoted exclusive of those classified as obese.
[16] Cut-off criteria outlined by Cole and colleagues (2000) were used to define overweight and obesity.

respectively 9.9% and 1.5% for boys and 13.1 % and 2.1% for girls[17] (Roelants & Hoppenbrouwers, 2001).

Obese children are at increased risk of becoming obese adults. Serdula et al. (1993) reviewed the existing literature on this matter and established that for all studies and across all ages, the risk of adult obesity was at least twice as high for obese children as for non-obese children. Furthermore, chronic health conditions associated with adult overweight and obesity include type 2 diabetes, hypertension, osteoarthritis, high blood cholesterol, sleep apnea, gallbladder disease, coronary heart disease, liver disease, muscoloskeletal disease and certain forms of cancer (Billington et al., 2000; Must et al., 1999). Must and Strauss (1999) provide an overview of medical comorbidities that are already prevalent in childhood and adolescent obesity, in which they distinguish between short- and long-term risks. Immediate consequences include orthopedic, neurological, pulmonary, gasteroenterological and endocrine conditions but these appear largely confined to more severely overweight children and adolescents. Intermediate consequences are to be understood as an increased likelihood of the development of cardiovascular disease and of the persistence of obesity into adulthood. Finally, research on long term consequences suggests an overall elevation of risk of cardiovascular disease and all-cause mortality among those who were overweight during childhood. The longer one suffers from overweight, the higher the chances of developing medical comorbidities. The possibly negative consequences of early obesity onset involve tremendous social costs. In the US, it has for example been calculated that in 20 years, obesity-associated annual hospital costs in youth increased more than threefold: from $35 million during 1979-1981 to $127 million during 1997-1999 (Wang & Dietz, 2002). In 1998, overweight- and obesity-attributable medical spending in the US

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[17]   The 85th (overweight) and 95th (obesity) percentile were used as cut-off criteria.

accounted for 9.1% of the total annual US medical expenditures and may have been as high as $78.5 billion (Finkelstein, Fiebelkorn, & Wang, 2003).

In only a small percentage of cases, obesity in childhood and adolescence is secondary to a defined underlying (mostly monogenetic) disease, such as Klinefelter and Prader-Willi syndrome (Wabitsch, 2000). So-called primary obesity is due to a long-term imbalance between energy intake and energy expenditure. There is clear evidence that multiple genetic factors play a role in determining which individuals become obese: twin, adoption and family studies indicate that heritability factors account for 45-75% of the inter-individual variation in adiposity (Farooqi & O'Rahilly, 2007). However, as genes have not changed substantially over the past few decades, heritable factors per se cannot explain the dramatic increase in obesity prevalence rates. A 'gene-environment interaction perspective' seems appropriate: genes increase the vulnerability to fat gain in individuals exposed to a high-risk environment (Bouchard, 1991). Hence, it is assumed that body weight is determined by an interaction between genetic and environmental factors acting through the physiological regulation of energy intake and expenditure (Kopelman, 2007). Environmental risk factors relevant for childhood obesity include familial eating habits and attitudes, physical activity levels, television viewing and time spent outdoors (Maffeis, 2000). Control of portion size, consumption of a diet low in fat and energy density and regular physical activity protect against obesity, but during the past few decades it has become increasingly difficult to adopt and maintain such behaviours (Hill & Peters, 1998).

Psychopathology in obese children and adolescents

Obesity is generally seen as a medical condition. The DSM-IV-TR (APA, 2000) does not include obesity as there is still substantial disagreement on the association of obesity and psychopathology. Although psychosocial comorbidity in obesity has been studied extensively, mixed findings typically

characterize the field (for a review, see: Friedman & Brownell, 1995). This has led some researchers to conclude that there is no evidence for elevated psychopathology levels in obese individuals. However, in chapter 2, it will be outlined in depth why such conclusion is premature. It will become clear that especially children and adolescents *referred* for obesity treatment seem a vulnerable subgroup. However, it will also be shown that the existing literature suffers from some methodological shortcomings that need to be dealt with before firm conclusions on this matter can be drawn.

Given the well-documented social stigmatization of obese individuals (Puhl & Brownell, 2001; Puhl & Latner, 2007), psychological problems in obese children and adolescents are generally considered a *consequence* of being obese. However, we alert to four studies that demonstrate how psychological problems in (referred) obese children and adolescents are related to adverse familial characteristics, and hence put this apparently sound explanation under review again. Epstein, Klein and Wisniewski (1994) showed that parental psychopathology and not degree of overweight was related to child psychological problems. In a subsequent study it was found that the child's degree of obesity did not account for any variance in child psychosocial problems beyond that accounted for by maternal psychopathology and familial socioeconomic status (Epstein, Myers, & Anderson, 1996). Zeller, Saelens, Roehrig, Kirk and Daniels (2004) also demonstrated that self- and mother-reported psychological difficulties in youth were more strongly associated with mothers' level of psychological distress and/or family socioeconomic status than with youngsters' characteristics (e.g., percent overweight, race). In a study by Decaluwé, Braet, Moens and Van Vlierberghe (2006) it was shown that the association of maternal psychopathology on the one hand and child internalizing and externalizing problem behaviour on the other hand was partly mediated by a specific form of parenting behaviour, namely inconsistent discipline. Overall, these studies seem to indicate that other variables might explain psychological

problems in obese youngsters, which pleads for a broader conceptualization of influences on psychopathology in obese children and adolescents.

Should obesity be considered an eating disorder?

Eating disorders rank among the most debilitating psychiatric disorders that affect young women (Klein & Walsh, 2003) and confer a significant burden to both sufferers and their caregivers (McDermott & Jaffa, 2005). Fairburn (2001) defines an eating disorder as 'a persistent disturbance of eating behaviour or a behaviour intended to control weight that significantly impairs physical health or psychological functioning, and is not secondary to a general medical condition or another psychiatric disorder'. Obesity is often mistaken for an eating disorder. However, given the contemporary idea of obesity being a medical condition with psychosocial consequences, obesity is currently *not* recognized as an eating disorder. Nevertheless, throughout chapters 2, 3 and 4, it will become clear that from childhood and adolescence onwards, obesity and eating disorders can become intertwined.

The three major eating disorders listed in the DSM-IV-TR (APA, 2000) are Anorexia Nervosa (AN), Bulimia Nervosa (BN), and Binge Eating Disorder (BED). The latter is included in the DSM-IV-TR under the category 'eating disorders not otherwise specified' (EDNOS). The EDNOS category includes eating disorders that do not meet all criteria to obtain a full blown diagnosis of AN or BN. Although the criteria for BED are currently still under study, this diagnostic category seems of special relevance in obese individuals. BED bares resemblance to BN since recurrent episodes of binge eating, involving the consumption of an excessive amount of food within a short time frame as well as a sense of loss of control while eating, are a core feature of both disorders. Yet, in BED, these episodes of binge eating are not compensated by the inadequate behaviours that are typical of BN (self-induced vomiting, laxative or diuretic abuse, fasting, and excessive exercising), which is an important differential

aspect between the two disorders. In adults, BED and obesity are often associated (de Zwaan, 2001), given the excess energy intake associated with binge eating along with the lack of compensatory behaviour. It should however be clear that obesity is *not* a necessary diagnostic criterion for BED. Hence, not every individual with BED is obese and vice versa.

In the introduction of chapter 2, it will be outlined that, although childhood obesity is one of the risk factors for the development of eating disorders in adulthood (Fairburn, Cooper, Doll, & Welch, 1999; Fairburn et al., 1998; Fairburn, Welch, Doll, Davies, & O'Connor, 1997), 'full blown' eating *disorders* are not common in obese children and adolescents[18]. As will be shown however, eating disorder *symptoms*, also denoted as ED pathology, are highly prevalent among overweight youth. This paradox calls into question the developmental appropriateness of adult DSM-IV-TR (APA, 2000) criteria to diagnose BN and BED in (obese) children and adolescents. In the so-called 'Oxford criteria', Fairburn and Cooper (1993) lowered the stringent DSM-standard for a diagnosis of BED or BN from at least 24 to at least 12 binge eating episodes over the past three months. Still, one could argue that a child who reports 10 binge eating episodes during the past three months might be not all that different from a child who reports 12. Obviously, the aforementioned issue of the appropriateness of categorical versus dimensional psychopathology assessment is raised here again. The child and adolescent obesity and eating disorder research community has responded to this issue in two ways. Firstly, one line of research specifically focuses on the definition and validation of youth-specific eating disorder syndromes (see e.g.: Lock, 2007; see e.g.: The Great Ormond Street Criteria: Nicholls, Chater, & Lask, 2000). Clearly, the idea remains that both researchers and clinicians do need a classification system with

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[18]   It should be noted that, given the diagnostic weight criterion for AN (body weight less than 85% of that expected for age and height), AN and obesity simply cannot co-occur.

distinct criteria set to define a disorder and foster communication. Secondly, another line of research addresses the study of ED *symptoms* as opposed to *disorders* in (obese) youth.

The attention that has recently been paid to the concept of loss of control over eating (LC) in obese youngsters (see also chapter 4) exemplifies how both lines of research are stimulated by one another. During the nineties, based on a thorough empirical literature review on binge eating, the diagnostic validity of the 'large amount of food'- criterion for the definition of binge eating was questioned (e.g.: Niego, Pratt, & Agras, 1997; Pratt, Niego, & Agras, 1998; Rossiter & Agras, 1990),. Marcus and Kalarchian (2003) subsequently outlined provisional research criteria for a new definition of BED in children and adolescents. These authors put forward LC and not the amount of food eaten as the key component in the definition of a binge eating episode. From a developmental perspective, it could be argued that the experience of LC in children (and adolescents) is not always accompanied by eating large amounts, as youngsters, while living at home, do not always have access to large amounts of food yet. As such, youngsters are not in a position to decide for themselves how much they eat and hence their binges are considered to be limited in scope. However, when children grow older, they acquire greater freedom subsequently there is the possibility that former subjective binge eating (episodes where loss of control is present but no objectively large amount of food is eaten) eventually evolve into objective binge eating (episodes where loss of control is present and an objectively large amount of food is eaten). The clinical significance of the LC concept for obese children and adolescents has subsequently been addressed in several empirical studies, which will be referred to in the introduction of chapter 4. In turn, Tanofsky-Kraff et al. (2007) recently made an attempt to describe the youth-specific presentation of LC. The experience of numbing, which is not one of the specific criteria for BED in DSM-IV-TR, was for example found to be

very common in youngsters experiencing LC, and thus seems to be a more developmentally appropriate criterion.

Comorbid psychopathology and treatment in obese youth

Research has demonstrated the effectiveness of multi-component pediatric obesity treatment (Epstein, Myers, Raynor, & Saelens, 1998; Jelalian & Saelens, 1999; Jelalian, Wember, Bungeroth, & Birmaher, 2007). Effective obesity treatment is seen as comprised of changes in food intake and increased physical activity, supported by (cognitive) behavioural modification principles and parental involvement. Unfortunately, some youngsters do not seem to benefit fully from this evidence-based approach. For example, in a sample of severely obese children and adolescents enrolled in a 10-month inpatient obesity treatment, Braet, Tanghe, Decaluwé, Moens and Rosseel (2004) found that after completion of the programme, participants mean percentage overweight was 126.8% with a standard deviation of 17.2%, implying that about 15% failed to achieve a non-obese status at the end of treatment.

The main point of departure in chapter 3 is the assumption that current highly standardised obesity treatment might be especially hampered in obese youngsters suffering from comorbid psychopathology (including ED pathology and eating disorders). First of all, in the introduction of chapter 3, it will be demonstrated that the association between psychopathology and weight loss during treatment in obese youth is largely unexplored. Furthermore, the existing studies have mainly focused on children in primary school. Also, methodological weaknesses prevent us from drawing firm conclusions on this issue. It has also been argued that studies on the effectiveness of obesity treatment in youth should evaluate both weight loss and psychosocial outcome (Jelalian & Saelens, 1999; Zametkin, Zoon, Klein, & Munson, 2004). In this regard, one could presume that severe psychopathology will not resolve when it is not explicitly

addressed during weight loss programmes. As will be outlined in chapter 3, research on this topic is scarce.

Aims of the present dissertation: Part 2

As noted earlier, the present dissertation also aimed to explore the utility of Young's model to understand psychopathology in a specific subgroup of youngsters suffering from psychological problems, i.e. obese children and adolescents. The central aim of chapter 4 is to investigate the association of cognitive vulnerability and ED pathology in obese youth. As will be outlined, the possible utility of Young's framework in obese youth can also be substantiated on the basis of the increased levels of ED pathology that are generally found in obese children and adolescents (Waller, 2000). The main aim of chapter 5 is to study the existence of cognitive vulnerability in obese youth and its association with internalizing and externalizing symptomatology. However, before these two studies can be set about, we firstly address some unresolved issues in the literature on obesity (treatment) in youth. In this regard, the central aim of chapter 2 is to investigate with a methodologically sound design whether referred obese youngsters can, as compared with non-referred obese youth, indeed be considered a vulnerable subgroup for the development of psychopathology. The central aim of chapter 3 is to investigate if psychopathology hampers obesity treatment in terms of weight loss and whether standard obesity treatment can actually resolve existing psychological problems in obese youth. If the latter is not the case and if Young's model stands the test in obese youth, specific components of cognitive therapy might provide an excellent opportunity to address emotional and behavioural problems during childhood and adolescent obesity treatment.

Summary of the empirical studies

In this final section, a summary of the empirical studies and their specific research goals is given. To minimize the overlap with other chapters, the paragraphs above only focused on the part of the conceptual background that is not dealt with elsewhere in the dissertation. Hence, for a full understanding of the rationale of each research question, we refer the reader to the introductions of the respective chapters. Further, for each study, we specifically point out its added value for the literature on (cognitive vulnerability and) psychopathology in obese and non-obese adolescents. Given the dissertation's title and the structure of the present chapter, one might be surprised to see the studies in obese youngsters come first (chapters 2, 3, 4 and 5). The order of the studies as it stands actually provides a gradually built up test of the tenability of Young's theory in youth. We consider the studies on Young's model in obese youth (chapter 4 and 5) the most exploratory in nature. Therefore, they were conducted first. Chapter 2 and 3 cleared their way by firstly addressing some unresolved issues in the literature on psychopathology in obese children and adolescents. From chapter 6 onwards, the utility of Young's theory is investigated more in depth.

Chapter 2: Psychiatric disorders and symptom severity in referred versus non-referred overweight children and adolescents

Psychosocial comorbidity in obese individuals has been studied extensively. However, inconsistent findings typically characterize the field. According to Friedman and Brownell (1995), these inconsistencies reflect methodological differences between studies on the one hand and heterogeneity within the obese population on the other hand. Therefore, these authors urge to conduct methodologically sound studies examining risk factors associated with psychopathology *within* groups of obese individuals. Referral status might be one such aspect of heterogeneity. In three studies, it was demonstrated that

overweight youngsters referred to an obesity clinic display higher levels of psychopathology as compared to non-referred overweight children and adolescents (Braet, Mervielde, & Vandereycken, 1997; Britz et al., 2000; Erermis et al., 2004). Remarkably, (1) only in the study by Britz et al. (2000) a structured clinical interview, currently seen as the 'gold standard' for the assessment of psychiatric disorders, was used and (2) in each of the studies, referred youngsters displayed a higher degree of overweight than non-referred youngsters. Further, in adults it was demonstrated that referred obese women suffered significantly more often from at least one disorder than non-referred obese women, whereas for men this difference could not be established (Herpertz et al., 2006). Finally, in obese youth it seems especially relevant to include the assessment of eating disorders. Research suggests that childhood obesity is a risk factor for the development of eating disorders in adulthood (Fairburn & Harrison, 2003). Although the prevalence of 'full blown' eating disorders in overweight youth is rather low, a substantial proportion of obese children and adolescents reports so called subclinical eating pathology, such as restraint attitudes or binge eating episodes (Decaluwe, Braet, & Fairburn, 2003; Tanofsky-Kraff et al., 2004).

This study aims to investigate whether referred overweight children and adolescents (8-18 years) differ from non-referred overweight youth concerning the presence of psychopathology, including eating pathology. More specifically, the following hypotheses are tested: *(1) Referred obese children and adolescents demonstrate more psychiatric disorders and more severe psychological symptomatology than non-referred obese youngsters; (2) These differences remain after controlling statistically for possible preexisting between group differences in age, gender, socioeconomic status and degree of overweight; (3) Demographic variables moderate the association of referral status and mental disorders.*

The study adds to the childhood and adolescent obesity literature (1) by examining risk factors associated with suffering *within* groups of obese youngsters; (2) by controlling statistically for preexisting differences in degree of overweight when comparing referred and non-referred youth; (3) by exploring the moderating role of demographic variables in the association of referral status and mental disorder; (4) by using a methodologically sound design (recruitment of a relatively large sample, including boys as well as girls and children as well as adolescents, and inclusion of state-of-the-art assessment of mental disorders and eating pathology).

Chapter 3: Mental disorder, symptom severity and weight loss in inpatient adolescent obesity treatment

A substantial proportion of referred obese youngsters suffers from severe forms of psychopathology (Britz et al., 2000; Vila et al., 2004). Research has demonstrated that some obese children and adolescents do not seem to benefit fully from evidence-based obesity treatment (see e.g.: Braet et al., 2004). In this regard, one could wonder to what extent the presence of mental disorders complicates treatment in obese youth. To the best of our knowledge, this has not been investigated yet. The influence of psychological symptoms on weight loss was examined, with mixed results (Braet, 2006; Braet & Van Winckel, 2000; Epstein, Wisniewski, & Wing, 1994). These inconsistencies might at least partly be attributed to the fact that these studies diverge greatly regarding the time point at which post-treatment weight loss was evaluated. It has been argued that studies on the effectiveness of obesity treatment should evaluate both weight loss and psychosocial outcome (Jelalian & Saelens, 1999; Zametkin et al., 2004). Research indicates a decrease in symptoms of internalizing and eating disorder symptoms but not externalizing problem behaviour (Braet et al., 2004; Epstein, Paluch, Saelens, Ernst, & Wilfley, 2001; Levine, Ringham, Kalarchian, Wisniewski, & Marcus, 2001; Myers, Raynor, & Epstein, 1998). Again, as far as

we know, the course of mental disorders during obesity treatment has not been examined yet.

This study aims to investigate the influence of psychopathology (including eating pathology) on evidence-based adolescent obesity treatment and vice versa. More specifically, the following hypotheses are tested: *(1) Psychological symptoms harshly affect weight loss but the presence of mental disorders complicates weight loss; (2) Evidence-based obesity treatment results in a decrease of psychological symptoms but cannot reverse the burden associated with the presence of mental disorders*.

The study adds to the childhood and adolescent obesity literature (1) by focusing on overweight adolescents and not children; (2) by investigating besides psychological symptoms more severe forms of psychopathology, namely mental disorders, using structured clinical interviews; (3) by assessing post-treatment psychopathology and weight loss just before participants leave the centre.

Chapter 4: Dysfunctional schemas and eating pathology in overweight youth: A case control study

In the literature on overweight in youth, much attention has recently been paid to 'loss of control over eating' (LC). LC is prevalent among overweight youngsters and has been shown to be associated with degree of overweight, low self-esteem, anxiety, depression and the cognitive correlates of eating disorders (EDs), i.e., eating, weight and shape concern (Decaluwe & Braet, 2003; Eddy et al., 2007; Glasofer et al., 2007; Goossens, Braet, & Decaluwe, 2007; Tanofsky-Kraff, Faden, Yanovski, Wilfley, & Yanovski, 2005; Tanofsky-Kraff et al., 2004). Nowadays, LC is considered the most prominent aspect of binge eating in youth (Marcus & Kalarchian, 2003). In the literature on EDs, Waller (Waller, 2000) recently incorporated Young's cognitive theory (Young et al., 2003) and pointed to the central role of dysfunctional schemas to

explain binge eating in Bulimia Nervosa (BN) and Binge Eating Disorder (BED). This author considers binge eating in BN and BED as a compensatory mechanism to deal with the negative emotions that arise when schemas are activated. Within Young's framework, cross-sectional research in adults confirmed the presence of maladaptive schemas in individuals with EDs and the association of schemas and binge eating (e.g.: Waller, 2003; Waller et al., 2000). In youth, studies have demonstrated that maladaptive schemas are associated with ED psychopathology (Muris, 2006) and overweight (Turner et al., 2005). The adult literature further suggests that in overweight individuals, dysfunctional schemas may be related to binge eating and to depression (Anderson, Rieger, & Caterson, 2006; Nauta, Hospers, Jansen, & Kok, 2000).

This study aims to explore whether ED pathology in obese adolescents is associated with the presence of maladaptive schemas. More specifically, the following hypotheses are tested: *(1) Obese adolescents suffering from LC report more severe dysfunctional schemas as compared with obese adolescents who do not report LC; (2) In obese youth, maladaptive schemas are positively associated with dietary restraint attitudes, eating, weight and shape concern and depressive symptomatology.*

This study adds to the adolescent obesity literature by exploring the existence of maladaptive schemas in obese youngsters suffering from ED pathology and hence the utility of Young's schema theory to understand ED pathology in obese adolescents. Since the incorporation of Young's cognitive model in childhood and adolescent psychopathology literature is still in its infancy, this study also adds to the general adolescent psychopathology literature by investigating on the basis of Young's framework the tenability of some of cognitive theory's main hypotheses in youth, i.e. the dimensionality of the schema concept and the assumption that maladaptive schemas are associated with psychological (in c.q. ED) symptoms.

Chapter 5: Dysfunctional schemas and psychopathology in referred obese adolescents

Referred obese youngsters seem a vulnerable subgroup for the development of psychopathology (Braet et al., 1997; Britz et al., 2000; Erermis et al., 2004; Vila et al., 2004). Hence, a comprehensive psychopathology model guiding research on and management of emotional and behavioural problems in treatment-seeking obese youngsters is warranted. Young's schema theory might provide a comprehensive framework to understand ED pathology (cf. supra) and possibly also other forms of psychopathology in obese youth. Preliminary evidence for the utility of Young's model in obesity was found in referred obese adults (Anderson et al., 2006) as well as in a small sample of non-referred overweight girls (Turner et al., 2005) .

This study aims to further explore the utility of Young's schema theory to understand psychological symptomatology in adolescents in general and in obese adolescents in particular. More specifically, the following hypotheses are tested: *(1) Referred obese youngsters display a greater severity of dysfunctional schemas as compared with normal weight controls; (2) In adolescents, dysfunctional schemas are generally related to and explain a substantial amount of the variance in internalizing and externalizing problem behaviour.*

The study adds to the adolescent obesity literature by exploring the existence of maladaptive schemas in obese youth and hence the utility of Young's schema theory as a comprehensive framework to understand psychopathology in referred obese youngsters. Since the incorporation of Young's cognitive model in childhood and adolescent psychopathology literature is still in its infancy, this study also adds to the general adolescent psychopathology literature by investigating, on the basis of Young's framework, the tenability of some of cognitive theory's main hypotheses in youth, i.e. the dimensionality of the schema concept and the assumption that maladaptive

schemas are associated with (in c.q. internalizing and externalizing) psychological symptoms.

Chapter 6: Dysfunctional schemas and psychopathology in adolescence: On the utility of Young's schema theory in youth

Young's cognitive theory on psychopathology (Young et al., 2003) has inspired many empirical studies in adults. Most of them focused on the psychometric properties of the YSQ (e.g.: Calvete, Estevez, de Arroyabe, & Ruiz, 2005; Hoffart et al., 2005; Lee, Taylor, & Dunn, 1999; Rijkeboer & van den Bergh, 2006; Schmidt et al., 1995; Waller, Meyer, & Ohanian, 2001) and/or tried to characterize cognitive content in varying forms of psychological problems (e.g.: Brotchie, Meyer, Copello, Kidney, & Waller, 2004; Jovev & Jackson, 2004; Leung, Waller, & Thomas, 1999; Pinto-Gouveia, Castilho, Galhardo, & Cunha, 2006; Shah & Waller, 2000). Overall, in adults the YSQ is considered a reliable and valid instrument and generally, empirical findings on the basis of the YSQ are in line with cognitive theory's main assumptions. Nevertheless, there are some unresolved (methodological) issues that prevent us from drawing firm conclusions on the validity of Young's theoretically proposed schema domains (YSQ second order factor structure) and on the tenability of the cognitive content-specificity hypothesis within Young's framework. From a developmental psychopathology perspective, it would be interesting to investigate whether the adult findings can be replicated in younger populations also. To date, only four studies have reported on Young's theory in adolescents (Cooper et al., 2005; Lumley & Harkness, 2007; Muris, 2006; Turner et al., 2005). Overall, in these studies the YSQ appeared reliable in terms of internal consistency, evidence was found for its discriminative power and theoretically meaningful correlates were established. Although these results are promising, more research in adolescents is definitely needed to confirm the utility of Young's theory in youth.

In this chapter, two studies are reported. The first study aims to investigate the internal consistency and the factor structure of the YSQ in adolescents. More specifically, the following hypotheses are tested: *(1) Young's theoretically proposed first (15 schemas) and second (five schema domains) order structure of the YSQ can be replicated in adolescents; (2) The 15 schema and five schema domain subscales are reliable in terms of internal consistency.* The second study aims to investigate the tenability in youngsters of some theoretical assumptions of the cognitive model in general and Young's schema theory in particular. More specifically, the following hypotheses were tested on the basis of Young's schema taxonomy: *(1) Support can be found for the dimensionality of the schema concept in youth; (2) In adolescents, maladaptive schemas are generally associated with and explain a substantial amount of the variance in internalizing and externalizing problem behaviour; (3) There is evidence for cognitive-content specificity in the association between maladaptive schemas on the one hand and anxiety, depression and disruptive behaviour disorder (symptoms) on the other hand.*

This study adds to the adult and adolescent literature on Young's cognitive psychopathology model by addressing some unresolved (methodological) issues and by testing the assumptions of Young's theory to understand psychopathology in youngsters.

Chapter 7: Parental origins of dysfunctional schemas in youngsters referred for antisocial behaviour problems demonstrating depressive symptoms

In adults, there appears to be a surprisingly limited research interest to investigate, within Young's framework, the (content-specific) associations of early familial experiences and maladaptive schemas (see e.g.: Meyer & Gillings, 2004; Shah & Waller, 2000). There is, to the best of our knowledge, only one adult study that has used the YPI and the YSQ to do so (Sheffield et al., 2005). In younger populations, more interest in the parental origin of schemas is shown

(Lumley & Harkness, 2007; Muris, 2006; Turner et al., 2005), but not one single study made us of the YPI. The 'traditional' cognitive model on psychopathology considers thoughts of loss, deprivation, failure and negative self-evaluation typical of depression (A. T. Beck, 1967, 1976; A. T. Beck et al., 1979; Clark et al., 1999). Within Young's framework, one would hence presume especially the first schema domain (Disconnection/Rejection) to be related to depressive symptoms. Research in adults seems to confirm this hypothesis (see e.g.: Calvete et al., 2005). Whereas the traditional cognitive model remains vague on the origin of schemas, Young (Young et al., 2003) hypothesized content-specificity in the association of parenting experiences during childhood and adolescence on the one hand and the development of specific maladaptive schemas on the other hand. Given that the YPI is constructed perfectly parallel to the YSQ, one could presume that particularly the parental practices related to schemas within the first schema domain, are typical of depression. From a clinical viewpoint, it would be interesting to investigate this hypothesis in youngsters referred for disruptive behaviour disorders who also display depressive symptomatology. Antisocial behaviour is prevalent among children and adolescents (Loeber & Hay, 1997) and brings about tremendous (social) costs (Scott, Knapp, Henderson, & Maughan, 2001). The ability of interventions to counteract antisocial problems seems rather limited (Kazdin, 1987) possibly because the specific mechanisms related to treatment success and failure have not yet been identified (Burke, Loeber, & Birmaher, 2002). In youngsters referred for disruptive behaviour disorders, depressive symptoms frequently complicate intervention (Loeber, Burke, Lahey, Winters, & Zera, 2000). When a specific form of familial adversity would be at play in depressive behaviour disordered youngsters as compared with non-depressive antisocial youngsters, interventions can be attuned to this, possibly leading to an optimizing of treatment.

From a theoretical viewpoint, this study aims to investigate in adolescents the tenability of Young's ideas on the parental origins of

maladaptive schemas. More specifically, the following hypotheses were tested: *(1) Youngsters referred for disruptive behaviour disorders suffering from comorbid depressive symptomatology report to a large extent maladaptive parenting practices related to schemas belonging to the Disconnection/Rejection domain; (2) These results can not be attributed to the presence of disruptive behaviour or to referral status.* From a clinical viewpoint, the aim of this study was to investigate whether antisocial depressed youth can be distinguished from antisocial non-depressed youth with respect to perceived parenting practices. In this regard, the abovementioned hypothesis can be reformulated as follows: *(1) Youngsters referred for antisocial behaviour problems who demonstrate comorbid depressive symptoms have the perception that their parents are cold, unstable, unpredictable and abusive; (2) These results cannot be attributed to the presence of disruptive behaviour or to referral status.*

This final study adds to the literature on Young's cognitive psychopathology model by addressing the tenability of Young's propositions on the parental origins of maladaptive schemas and by testing the utility of Young's theory to understand psychopathology in youngsters.

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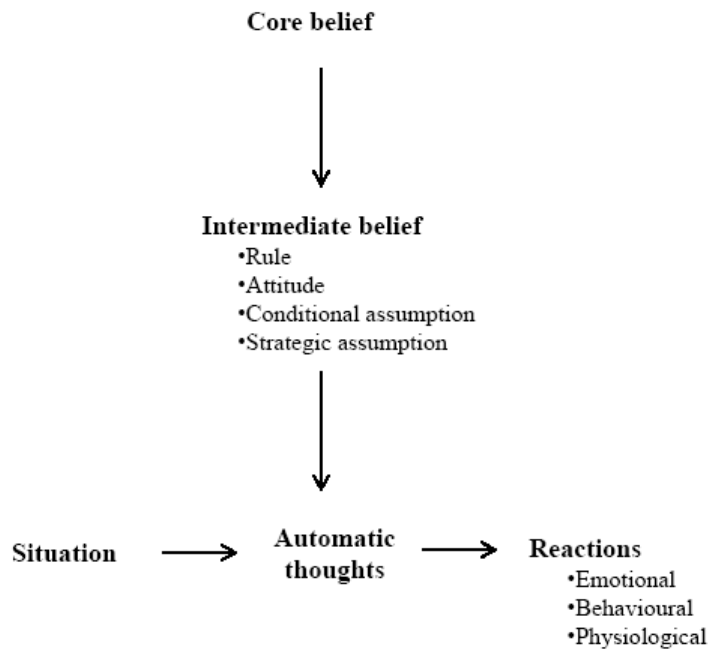
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Figures

Figure 1. *The cognitive psychopathology model (J. S. Beck, 1995)*

Core belief

↓

Intermediate belief
•Rule
•Attitude
•Conditional assumption
•Strategic assumption

↓

Situation ⟶ **Automatic thoughts** ⟶ **Reactions**
•Emotional
•Behavioural
•Physiological

Chapter 2

Psychiatric disorders and symptom severity in referred versus non-referred overweight children and adolescents[1]

This study aimed firstly to investigate whether youngsters referred for overweight treatment differ from non-referred overweight youngsters on the prevalence of psychiatric disorders and psychological symptoms. Secondly, the potentially moderating role of age, gender, socio-economic status (SES) and degree of overweight in the association of referral status and mental disorder in overweight youth was explored. Participants were 115 overweight youngsters enrolled in an obesity treatment programme and 73 non-referred overweight youngsters. It was demonstrated that a substantial proportion of referred and non-referred overweight children and adolescents suffers from mental disorders. Referral status and age were associated with the presence of psychopathology. However, differences between referred and non-referred youngsters were not as pronounced as expected on the basis of earlier research in the field.

Introduction

Although overweight is mostly referred to as a medical condition, its psychosocial comorbidity has been studied extensively (Friedman & Brownell, 1995). However, in research on overweight in youth, structured clinical interviews, currently seen as the 'gold standard' for the assessment of psychiatric disorders (Costello, Egger, & Angold, 2005), are rarely included. With the M-CIDI, Britz and colleagues (2000) obtained lifetime psychiatric diagnoses in 33 out of 47 obese adolescents (15–21 years) referred for overweight treatment. Vila et al. (2004) interviewed 155 referred obese youngsters (5-17 years) using the K-SADS-R and demonstrated current mental disorders in 56.77% of the sample. On the other hand, Lamertz, Jacobi, Yassouridis, Arnold and Henkel (2002) found considerably lower prevalence rates. From a large-scale community survey on mental disorders in youth, the authors picked out all participants (14-17 years) with a BMI above 95th percentile (n=86) and demonstrated life-time psychiatric disorders to be equal in overweight and normal weight youth (38.80% versus 39.65%). The latter findings corroborate the results from a longitudinal study by Mustillo et al. (2003), in which the percentage of overweight youngsters (BMI>95th percentile; n=270) who had suffered from a current disorder at any of the annual assessments was low (e.g. 3.00% for mood and 2.17% for anxiety disorders). Moreover, when compared with youngsters who had never been obese during the 7-year study period, only those youngsters who were obese from childhood onwards exhibited higher levels of oppositional defiant disorder and (only for boys) depression. No other differences emerged. According to Friedman and Brownell (1995), such inconsistent findings typically characterize the field and reflect methodological differences between studies on the one hand and heterogeneity within the obese population on the other hand. Therefore, these authors urge to conduct

methodologically sound studies examining risk factors associated with psychopathology *within* groups of obese individuals.

Referral status might be one such aspect of heterogeneity. Parents of overweight youngsters referred to an obesity clinic report more symptoms of internalizing and externalizing problems in their children as compared to parents of non-referred overweight youngsters (Braet, Mervielde, & Vandereycken, 1997; Erermis et al., 2004). In the Britz et al. study (2000) a gender-matched sample of non-referred obese youngsters was composed by selecting the 47 heaviest adolescents from a large population-based control group. Referred obese youngsters displayed significantly more diagnoses of mood (42.55% versus 17.02%), anxiety (40.43% versus 21.28%) and somatoform (14.89% versus 0.00%) disorders. Unfortunately, the Vila et al. study (2004) did not include a non-referred sample. More studies with state-of-the-art assessment of psychiatric disorder are needed to replicate initial findings on help-seeking as a potential source of variance within the population of overweight youngsters.

Strikingly, in the Braet et al. (1997), as well as in the Erermis et al. (2004) and the Britz et al (2000) study, referred overweight youngsters displayed a higher degree of overweight than the non-referred group. Erermis et al. (2004) entered degree of overweight as a covariate in the analyses, which clearly reduced the number of between group differences in psychological symptoms. It is unclear to what extent confounding effects of degree of overweight might have accounted for the results of the other two studies.

In adults, Herpertz and colleagues (2006) demonstrated that referred obese women suffered significantly more often from at least one mental disorder than non-referred obese women, whereas for men this difference could not be established. The latter findings point at the role of gender as a moderator in the relation of referral status and psychopathology in overweight individuals. Research on psychopathology in obesity would greatly benefit from studies on the importance of degree of overweight and demographic factors (Faith, Matz, &

Jorge, 2002; Friedman & Brownell, 1995). To the best of our knowledge, in overweight children or adolescents, the moderating role of demographic variables and degree of overweight in the association of referral status and psychopathology has not been investigated yet.

In overweight youth, it seems especially relevant to include the assessment of eating disorders. Research suggests that childhood obesity is a risk factor for the development of eating disorders in adulthood (Fairburn & Harrison, 2003). However, the prevalence of 'full blown' eating disorder diagnoses in overweight youth is rather low. In the study by Britz and colleagues (2000) three referred obese adolescents (6.38%) obtained a diagnosis of Bulimia Nervosa (BN), another three of Binge Eating Disorder (BED) and 51.06% reported binge eating episodes. Unfortunately, in the study by Vila et al. (2004) eating disorders were not included. Lamertz et al. (2002) diagnosed eating disorders in 3.85% of the overweight youngsters (BMI>90th percentile; n=312). Finally, in the study by Mustillo et al. (2003) BN was present on at least one of the assessments in 0.63% of those youngsters who had been obese on at least one of the assessments.

The clinical interview most widely used in the literature on eating disorders is the Eating Disorder Examination (EDE: Fairburn & Cooper, 1993). Using a modified version for children and adolescents (ChEDE: Bryant-Waugh, Cooper, Taylor, & Lask, 1996), Decaluwé and Braet (2003) obtained current diagnoses of BED in 2 and subclinical binge eating in 18 out of 196 referred obese children and adolescents (10-16 years). Nobody received a diagnosis of BN. Glasofer and colleagues (2007) detected BED in 6.25% of the referred overweight youngsters in their sample (n=160; age 11-18), subclinical binge eating was reported by 23.75%. Finally, a study by Tanofsky-Kraff and colleagues (2004) in a non-referred sample of 82 overweight 6 to 13 year olds revealed neither BN nor BED diagnoses. As far as we know, the ChEDE has

never been used to compare prevalence rates of eating disorders in referred and non-referred overweight children and adolescents.

Youngsters presenting for treatment of overweight are those that suffer, be it merely from their overweight, from comorbid psychopathology or from both. To enhance quality of life in these children and families, their concerns should be addressed adequately and effective care presupposes an overall picture of needs. Moreover, it remains to be tested to what extent this adequate care can be attained by current limited assessment procedures and highly standardised treatment programmes. Furthermore, clinicians are faced with dropout and relapse. It could be hypothesized that treatment might be especially complicated in overweight children and adolescents with associated psychological problems. Finally, unravelling how demographic variables and degree of overweight are related to psychopathology in overweight youth enables practitioners to identify vulnerable subgroups of youngsters presenting for treatment.

To conclude, the present study aimed to (a) investigate whether referred overweight youngsters differ from non-referred overweight youth concerning the prevalence of current psychiatric disorders, (b) explore possible confounding effects of degree of overweight or demographic factors and (c) predict the presence of mental disorders by examining possible moderating effects of age, gender, socio-economic status (SES) and degree of overweight in the association of referral status and mental disorders. The use of clinical interviews, yielding only categorical outcomes, is sometimes criticised as youngsters can be undiagnosed but still impaired. Self-report questionnaires generate dimensional data, representing psychopathology on a continuum which probably does more justice to the concept. Hence, a 'multi-method approach', including both a categorical taxonomy and dimensional assessment of symptom severity seems the most comprehensive way to study psychopathology in youth. Therefore, (d) differences between referred and non-referred overweight youngsters on anxiety, depression, internalizing and externalizing symptoms were also investigated with

well-validated self-report instruments, while taking into account possible confounding effects of degree of overweight or demographic factors. As in this respect a multi-informant approach is considered most appropriate (Achenbach, Mcconaughy, & Howell, 1987), parental report was also obtained.

Method

Participants

The referred sample consisted of 115 overweight youngsters (69 girls; 46 boys) admitted for treatment of their overweight with a mean age of 13.76 years (SD = 2.20; range 8-18). The non-referred sample consisted of 73 overweight children and adolescents (45 girls; 28 boys) with a mean age of 13.74 years (SD = 2.54; range 8-18). Both groups did not differ from each other in terms of age, $F(1,186) = 0.00$, $p = .96$, or gender distribution, $\chi^2(1) = 0.05$, $p = .82$.

Measures

Weight and height were measured. The adjusted BMI (AdjBMI) [(actual BMI/ Percentile 50 of BMI for age and gender) x 100] was calculated, based on normative data from the Netherlands (Fredriks, van Buuren, Wit, & Verloove-Vanhorick, 2000) To standardize BMI across international samples, BMI z-scores were calculated based on normative data from the United States (Centers for Disease Control and Prevention 2000 standards: Ogden et al., 2002).

Socio-economic status (SES) was calculated using the Hollingshead Index of Social Position (Hollingshead, 1975), based on parental education and occupation.

The *Structured Clinical Interview for DSM-IV - Childhood version* (KID-SCID: Dreessen, Stroux, & Weckx, 1998; Hien et al., 1994) is an interviewer-based semi-structured instrument to generate childhood DSM-IV diagnoses for clinical research studies, which is based on the SCID for adults

(Spitzer, Williams, & Gibbon, 1986). Several studies provide support for the reliability and the validity of the KID-SCID (Matzner, 1994; Matzner, Silva, Silvan, Chowdhury, & Nastasi, 1997; Smith, Huber, & Hall, 2005). To assure interrater reliability of diagnoses, we conducted a pilot study on the KID-SCID in 36 youngsters. Interviews were taped and scored by the interviewer and two independent raters (108 ratings). Cohen's κ ranged from .79 and 1, suggesting excellent agreement.

The *Eating Disorder Examination – Child version* (ChEDE: Bryant-Waugh et al., 1996) is a standard investigator-based interview measuring the severity of the core psychopathology of eating disorders and generating eating disorder diagnoses. The ChEDE contains four subscales designed to provide a profile of individuals in terms of four major areas of eating disorder symptoms: restraint, eating concern, shape concern and weight concern. In addition, the ChEDE assesses presence and frequency of different forms of overeating and compensatory behaviour. Several studies have demonstrated the reliability and validity of the ChEDE (Decaluwe & Braet, 2004; Glasofer et al., 2007; Tanofsky-Kraff et al., 2004; Watkins, Frampton, Lask, & Bryant-Waugh, 2005). In the present study, Oxford criteria (Fairburn & Cooper, 1993) were used to generate eating disorder diagnoses. Binge eating was defined as 'the presence of at least one objective bulimic episode over the past three months', irrespective of whether or not an eating disorder was present.

The *Children's Depression Inventory* (CDI: Kovacs, 1996) assesses cognitive, affective and behavioural symptoms of depression in youth. The Dutch version of the CDI is considered a reliable and valid instrument (Timbremont & Braet, 2002; Timbremont, Braet, & Dreessen, 2004).

The *Spence Children's Anxiety Scale* (SCAS: Spence, 1998) is a self-report questionnaire measuring specific symptoms of six DSM-IV anxiety disorders, namely generalised anxiety disorder, separation anxiety disorder, social phobia, panic disorder and agoraphobia, obsessive-compulsive disorder

and physical injury fears. In psychometric studies on the Dutch version in large samples of school children, the SCAS has shown to be reliable and valid (Muris, Schmidt, & Merckelbach, 2000).

The *Child Behavior Checklist* (CBCL: Achenbach, 1991a) and the *Youth Self Report* (YSR: Achenbach, 1991b) are parallel questionnaires assessing several emotional and behavioural problem areas as reported respectively by the parent and the child. For both informants, a global internalizing and externalizing problem score can be obtained. Dutch versions of both 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.

Procedure

The institutional review board of Ghent University approved the study protocol and informed consent was obtained from both children and parents. Interviews and questionnaires were administered by trained psychology students and psychologists. Questionnaires and interviews were held randomized on different days. Youngsters between 8 and 18 years of age who were diagnosed as being primary overweight (adjBMI ≥ 120) were included. Exclusion criteria were mental retardation and the presence of developmental syndromes like Prader-Willi and Pervasive Developmental Disorder. In Belgium, children who are mentally retarded attend a specific type of education for children with special needs (so called 'type 1' or 'type 2' education). Mental retardation was assessed by screening youngsters for educational level prior to the study.

To compose the referred group, youngsters were recruited via an obesity treatment centre. A detailed description of the treatment programme is given elsewhere (Braet, Tanghe, Decaluwe, Moens, & Rosseel, 2004). Data were gathered in consecutive waves during a two year study period: each time in

January and July, all eligible youngsters who had recently started the treatment, were invited to participate. Across the four waves, 123 obese children and adolescents met the inclusion criteria. The staff of the treatment centre requested to leave out one girl, one youngster refused to participate and six dropped out.

To compose the non-referred group, the study was firstly announced via advertisements in healthcare magazines, yielding a sample of 36 overweight youngsters. Secondly, participants were recruited via large-scale school mailings, resulting in an additional sample of 41 non-referred overweight adolescents. Each time, the study was described as research into the psychosocial well-being of youngsters 'with a bigger size'. Youngsters meeting the general inclusion criteria were eligible when at the moment of the study they did not receive 'any treatment in order to lose weight with at least the help of a dietician'. Other forms of psychiatric or psychological help, defined as 'any treatment by a psychologist or a psychiatrist', were questioned. (Past) use of psychotropic medication was not inquired, so no data on this matter were available. Of those willing to participate, 5.19% (n=4) received current overweight treatment and were therefore included in the referred sample. Two (2.60%) youngsters received current psychological or psychiatric help. All participants in the non-referred group were aware that they would not receive any kind of treatment as part of the study. Due to the recruitment method, the non-referred group does parallel a population of overweight youngsters who are currently not under treatment for overweight but is not necessarily representative for the general population of overweight children and adolescents.

Data Analysis

For the first research question, prevalence rates were expressed as a percentage for both samples. Rates between study groups were compared using chi-square statistics if all expected frequencies in the contingency table were ≥ 5, otherwise a Likelihood Ratio test was performed. Comparisons were made for

the overall prevalence of disruptive behaviour, mood, anxiety and eating disorders, for the prevalence of binge eating and for the prevalence of youngsters suffering from at least one mental disorder. Secondly, in case of significant differences in prevalence rates, odds ratios (OR) and 95% confidence intervals (CI) were calculated using logistic regression analyses, controlling for possible differences in degree of overweight or/and SES between the referred and the non-referred group. For the third research question, a binary hierarchic logistic regression analysis was conducted with the presence of at least one diagnosis as the dependent variable. Age, gender (0 = boy; 1 = girl), SES and degree of overweight were entered in block 1, group (0 = non-referred; 1 = referred) was entered in block 2 and finally the interactions of (1) age and group, (2) gender and group, (3) SES and group and (4) adjBMI and group were entered in block 3. Finally, for the fourth research question, an Analysis of (Co)variance and four Multivariate Analyses of (Co)variance were conducted, each time with referral status as a factor and respectively the CDI total score, the SCAS subscales, the EDE subscales, the YSR subscales and the CBCL subscales as the dependent variables (possible differences in degree of overweight and SES between referred and non-referred youngsters were entered as covariates). All analyses were conducted using SPSS 15.0. *P*-values ≤ 0.05 were considered statistically significant and all tests were two-tailed. In three youngsters, the (complete) administration of the KID-SCID was too much of a burden and had to be interrupted. Each time in one participant the administration of the KID-SCID or the EDE failed due to organisational reasons. It was decided to keep these youngsters in the other analyses.

Results

Descriptives

In the referred sample, the mean BMI was 33.99 (*SD* = 5.60; range 23.06 - 50.70), the mean adjusted BMI was 181.62 (*SD* = 25.92; range 135.87 -

256.04) and the mean BMI z-score was 2.27 (SD = 0.29; range 1.53 - 2.99). In the non-referred sample, the mean BMI was 27.35 (*SD* = 4.32; range 20.04 - 42.97), the mean adjusted BMI was 145.82 (*SD* = 16.62, range 120.53 - 202.68) and the mean BMI z-score was 1.69 (SD = 0.34; range 0.89 – 2.37). The referred obese youngsters displayed a significantly higher adjusted BMI than the non-referred participants, $F(1,186) = 110.35$, $p < .001$. The referred group demonstrated significantly lower SES than the non-referred group, $F(1,183) = 10.98$, $p = .001$.

Prevalence of psychiatric disorders and confounding effects of degree of overweight and SES

Forty-two referred (37.50%) and 17 non-referred (23.29%) youngsters received one or more psychiatric diagnoses. In the referred group, 9 (8.04%) youngsters were diagnosed with at least one disruptive behaviour disorder, 9 (8.04%) with at least one mood disorder, 18 (16.22%) with at least one anxiety disorder and 13 (11.40%) with at least one eating disorder. In the non-referred group, five participants (6.85%) were diagnosed with at least one behavioural disorder, five (6.85%) with at least one mood disorder, 10 (13.70%) with at least one anxiety disorder and one (1.37%) with an eating disorder. In the referred group, there were 33 subjects (29.46%) with one diagnosis, six with two diagnoses (5.36%), two with three diagnoses (1.79%) and one with four diagnoses (0.89%). In the non-referred group, there were 11 subjects (15.07%) with one diagnosis, five with two diagnoses (6.85%) and one with four diagnoses (1.37%). Binge eating was found in 31.58% of the referred versus in 12.33% of the non-referred youngsters. An overview of the prevalence rates is depicted in Table 1.

The referred and the non-referred group differed significantly on the number of participants receiving at least one diagnosis, $\chi^2(1) = 4.11$, $p < .05$, on the prevalence of 'full blown' eating disorders, $LR(1) = 8.03$, $p < .01$, and on the

prevalence of binge eating, $\chi^2(1) = 9.03$, $p < .01$. After controlling for differences in degree of overweight and SES between the referred and the non-referred group, none of the calculated odds ratios appeared significantly increased.

The moderating role of demographic variables and degree of overweight in the association of referral status and mental disorders in overweight youngsters

In block 1 age predicted mental disorder significantly, $Wald(1) = 4.11$, $p < .05$. Youngsters with at least one diagnosis, were significantly older than youngsters without, $F(1,183) = 5.67$, $p < .05$. In block 3 the interaction of SES and referral status appeared a significant predictor, $Wald(1) = 6.36$, $p = .01$. Although in the referred group youngsters with at least one diagnosis were somewhat lower in SES than youngsters without, no significant differences emerged, $F(1,107) = 2.42$, $p = .12$. However, in the non-referred group youngsters with at least one mental disorder exhibited significantly higher SES than youngsters without, $F(1,71) = 5.39$, $p < .05$.

Self- and parent reported symptom severity and confounding effects of degree of overweight and SES

Table 2 displays means/standard deviations on the questionnaires administered and on the EDE subscales, and F-values/significance levels before taking into account between group differences in degree of overweight and SES. As can be seen, referred youngsters displayed significantly more self-reported depressive, $F(1,164) = 3.84$, $p = .05$, and parent-reported internalizing symptoms, $F(1,166) = 7.97$, $p < .01$. When degree of overweight and SES were included as covariates in the analyses, no differences between the referred and the non-referred group were found. However, a trend towards a higher level of parent reported symptomatology remained, $F(2,160) = 2.92$, $p = .06$. More specifically, referred youngsters still displayed significantly higher scores on the CBCL internalizing problems subscale, $F(1,161) = 4.62$, $p < .05$.

Discussion

The present study revealed that a substantial proportion of overweight youngsters suffer from mental disorders. Overall, a higher level of psychopathology was found in the referred group. More specifically, referred youngsters displayed more eating disorders and binge eating than non-referred youngsters and exhibited a greater severity of self- and parent-reported internalizing symptoms. Referral was also associated with a higher degree of overweight and lower SES. After controlling statistically for these pre-existing differences in degree of overweight and SES, only the greater severity of parent-reported internalizing symptoms in referred youth remained significant. Older age appeared generally predictive for the presence of mental disorders and in the non-referred group SES was positively associated with psychiatric disorder. Overall, in line with earlier research, these findings suggest heterogeneity among overweight individuals.

In this study, clinical interviews, known as the 'gold standard' for assessment of psychiatric disorders, were used. A relatively large sample was recruited, including boys as well as girls and children as well as adolescents, and special attention was given to state-of-the-art assessment of eating disorders. Moreover, we controlled statistically for pre-existing differences in degree of overweight and demographic factors between the referred and the non-referred sample. With the present methodologically sound design, an attempt was made to deal with the flaws of earlier studies. Finally, this is the first time that demographic factors were examined as potential moderators in the association of referral status and mental disorder.

Differences between referred and non-referred overweight youngsters were not as pronounced as expected. Surprisingly, this was even the case when possible confounding effects of degree of overweight and SES were *not* taken into account. In the early nineties, it was hypothesized that especially the concurrence of obesity and comorbid psychopathology lead to referral. Due to

the stigma associated with psychiatry, overweight individuals were presumed to prefer obesity treatment instead of psychotherapy, leading to substantially higher degrees of psychopathology in referred groups (Lamertz et al., 2002). Apparently, this so-called 'stigma hypothesis' seems to hold no longer. Comparison of the present findings with the study by Braet et al. (1997) indicates that for the referred group CBCL-scores in this study were somewhat higher, whereas for the non-referred group, the increase was substantial. During the past decade, the issue of overweight has received a tremendous amount of attention. Prevention programmes have been set up that focus on attaining a healthy life style. Hence, overweight individuals are permanently 'in the picture' and implicitly blamed for not being able to take responsibility for their health. Briefly, whereas the social discrimination associated with obesity (Puhl & Brownell, 2001) seems of all times, nowadays being overweight *in itself* has become a major stressor. Concerning referral, this 'spirit of the times hypothesis' has at least one important implication: overweight in itself might be a sufficient reason for people to seek help. Consequently, referred youngsters will display more heterogeneity and differences between referred and non-referred groups will become less marked.

The precise nature of the association between obesity and psychopathology remains unclear. In the present study, it was demonstrated that when overweight children become older, they are more likely to develop a mental disorder. In line with findings by Mustillo et al. (2003), we put forward the idea that being overweight in early life might form a scar, leading to psychopathology in individuals confronted with stress. In line with this so-called diathesis-stress perspective on psychopathology (Rutter, 2006), the 'spirit of the times hypothesis' predicts a general increase of psychological problems in overweight individuals, as both a breeding ground for diatheses and higher stress levels are created.

Prevalence rates of psychiatric disorders in the present referred sample were lower than those in the studies by Britz et al. (2000) and Vila et al. (2004). However, the former study also demonstrated substantially higher prevalence figures as compared with the latter. This might partly be due to the differences in age group and to the assessment of lifetime diagnoses by Britz et al. (2000) but not by Vila et al. (2004). Moreover, it is also important to distinguish between so called investigator-based interviews (K-SADS-R, KID-SCID, ChEDE) on the one hand and respondent-based interviews (M-CIDI) on the other hand. Respondent-based interviews (often computerised) are highly cost-effective and predominantly used in epidemiological research. However, it could be assumed that interviewer-based formats yield higher quality data (Klein, Dougherty, & Olino, 2005) which seriously hampers comparison of studies that differ on the interview method used. Hence, methodologically the present study most closely resembles the one by Vila et al. (2004) and leads to similar conclusions: a substantial number of referred obese youngsters suffer from mental disorders, mostly anxiety disorders. Prevalence rates in the present study were more or less similar for affective disorders (8% versus 12%) but lower for disruptive behaviour (8% versus 16%) and anxiety disorders (16% versus 32%). One reason might be that in the Vila et al. study, the K-SADS-R was administered to both the children and their parents: application of the so called 'OR'- rule might have erroneously enhanced the number of diagnoses. Comparison of results in the non-referred group with the community studies by Lamertz and colleagues (2002) is difficult due to the use of a respondent-based interview assessing life-time diagnoses. Mustillo et al. (2003) used an interviewer-based format but the authors only presented prevalence rates summed over the 7-year study period, which is more or less a measure of lifetime diagnoses.

Remarkably, the prevalence of ADHD in the present study was lower than the worldwide general population prevalence rate of about 5% (Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007). This is the more surprising in light

of mounting evidence for a significant comorbidity between obesity and ADHD (Agranat-Meged et al., 2005; Holtkamp et al., 2004). We assume that especially for ADHD, relying on the information of a child or an adolescent leads to an *under*estimation of the prevalence. Practice parameters for the assessment of youngsters with ADHD consider the parent interview as the core of the assessment process and standardized interviews of children and adolescents as less useful (Dulcan et al., 1997). First of all, some children and most adolescents with ADHD are able to maintain attention and behavioural control in the office setting, which might influence the investigator's judgements. Secondly, youngsters might have difficulty in recalling whether ADHD-symptoms occurred before the age of 7 years and/or in recognizing their ADHD-symptoms as 'problematic', as required by DSM to meet criteria for the diagnosis. It should however be noted that this study did not aim to provide prevalence estimates of DSM-disorders in overweight youth. The main objective was to investigate differences between referred and non-referred youngsters. As both the interview and the interviewers were kept constant across samples, we consider the methodology adequate for the purpose of the present study.

In the referred group, 32% reported binge eating episodes. The prevalence of binge eating was clearly in line with the latest findings by Glasofer and colleagues (2007). Although the presence of severe eating pathology was largely constricted to referred youngsters, it should be noted that even in the non-referred sample 12% reported binge eating episodes and that eating, weight and shape concern were present to the same degree as in the referred group. Comparison of our findings with the methodologically parallel study of Decaluwé and Braet (2003) also seems to indicate that in referred obese youngsters the prevalence of binge eating has augmented during the past years. In sum, from childhood and adolescence onwards, overweight and eating disorders become (more and more) intertwined. As we know that overweight in youth is a risk factor for the development of eating disorders in adulthood it

could be assumed that eating pathology in overweight is likely to persist and aggravate in later life. Longitudinal research is now needed to investigate this.

A major limitation of the study is that the non-referred sample was not recruited in a truly population-based fashion. Due to the use of advertisements and school mailings, the present non-referred sample is not necessarily representative for the general population of overweight children and adolescents. Both in the study by Braet et al. (1997) and the study by Erermis et al. (2004), non-referred overweight youngsters were also recruited via schools, more precisely by selecting overweight youngsters on the basis of the school physician's data on weight and height. In such designs, youngsters and their parents *opt* to participate, which limits the external validity of the study. The study by Britz and colleagues (2000) was unique by looking at real population based obese adolescents. However, even when these authors selected the non-referred adolescents with the highest BMI, referred youngsters were still substantially heavier. Also in the present study, referral was associated with a higher degree of overweight. We assume that a ceiling effect might be at play: once a certain degree of overweight is attained, there is a very high probability for people to seek help. As such, it is very difficult to match referred youth with population based extremely obese adolescents: thousands of youngsters need to be screened and consequently researchers are forced to administer less reliable respondent-based interviews. Moreover, a study including a truly population-based sample will probably suffer from inadequate power to form conclusions, since one presumes prevalence rates of mental disorders to be considerably lower in community samples. Due to low prevalence rates, wider CI's are obtained, generally leading to statistically insignificant results.

In the non-referred group youngsters with high SES appeared more vulnerable for mental disorders. It could be argued that, due to our recruitment method, subjects of higher SES with a psychiatric diagnosis were more likely to participate. However, research in adults can also throw light upon this

unexpected finding. In a community sample of adults, Simon et al. (2006) recently demonstrated a stronger association of obesity and mental disorders in individuals with higher educational attainment. This high SES group was also among those with the lowest overall rates of obesity. Simon and colleagues (2006) hypothesize that the social discrimination of overweight individuals has a stronger impact in socio-demographic groups with lower obesity rates. In line with our 'spirit of the times hypothesis', we also assume that the mere presence of obesity might be most stressful in high SES groups. It should be taken into account that mechanisms of referral are also a function of the country's health care insurance system. Although in Europe almost universal coverage of the population is provided for the majority of health care services, there are large differences between countries in the specific public/private insurance mix. For Belgium, analyses even indicate inequity favoring the poor (van Doorslaer, Masseria, & Koolman, 2006), which might help to explain why in the referred group youngsters displayed lower SES. We hypothesize that the stigma associated with help seeking prevents the high SES group from looking for treatment. In countries with private insurance, (specialized) health care is more likely to be a status symbol.

Further research will need to identify crucial factors that prevent individuals from seeking help. Moreover, longitudinal studies are needed to understand how obesity and psychopathology are related. In this regard, the diathesis-stress perspective seems promising. Next, one could wonder how obesity treatment in overweight youngsters with comorbid psychopathology must be outlined. Research should focus on the extent to which psychopathology in referred youth is associated with drop-out, weight loss and relapse. It needs to be investigated how many youngsters still suffer from mental disorders after standardized obesity treatment and whether additional psychotherapy (and what kind of psychotherapy) during obesity treatment is helpful. Finally, it seems

interesting to explore how referral *history* hampers adherence to overweight treatment.

To conclude, the results of the present study demonstrate that also in non-referred groups, a substantial proportion of youngsters suffer from comorbid psychopathology. Hence, from a mental health perspective, it could be argued that interventions should not solely target referred youth. Adequate care for youngsters presenting for treatment of overweight requires clinicians to be alert on and address possible psychopathology in general and eating pathology in particular. This pleads for a multidisciplinary approach, including close collaboration with liaison psychiatrists and psychologists.

Acknowledgements

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Tables

Table 1. *Prevalence of DSM-IV disorders in referred and non-referred obese children and adolescents*

	Referred		Non-referred		$X^2(1)$	OR (95% CI)[2]
	N	*%*	*N*	*%*		
Attention Deficit Hyperactivity Disorder	1	0.89	2	2.74		
Oppositional Defiant Disorder	4	3.57	2	2.74		
Conduct Disorder	3	2.68	1	1.37		
Conduct Disorder - NOS	1	0.89	0	0.00		
Any Disruptive Behaviour Disorder	**9**	**8.04**	**5**	**6.85**	**0.09**	
Major Depressive Disorder	5	4.46	3	4.11		
Manic Episode	0	0.00	0	0.00		
Hypomanic Episode	1	0.90	1	1.37		
Dysthymic Disorder	1	0.90	0	0.00		
Major Depressive Disorder –NOS	2	1.80	1	1.37		
Any Mood Disorder	**9**	**8.04**	**5**	**6.85**	**0.09**	
Separation Anxiety Disorder	2	1.80	1	1.37		
Social Phobia	0	0.90	2	2.74		
Specific Phobia	7	6.31	5	6.85		
Obsessive Compulsive Disorder	1	0.90	1	1.37		
Post Traumatic Stress Disorder	4	3.60	2	2.74		
Generalised Anxiety Disorder	0	0.00	1	1.37		
Panic Disorder	0	0.00	0	0.00		
Agoraphobia	0	0.00	0	0.00		
Anxiety Disorder – NOS	7	6.31	2	1.37		
Any Anxiety Disorder	**18**	**16.22**	**10**	**13.70**	**0.22**	
Adjustment Disorder	4	3.60	0	0.00		
Binge Eating Disorder	10	8.77	1	1.37		
Bulimia Nervosa	3	2.63	0	0.00		
Any Eating Disorder	**13**	**11.40**	**1**	**1.37**	**8.03[3]****	**6.30 (0.68-58.81)**
Binge Eating	36	31.58	9	12.33	9.03**	1.88 (0.71-4.98)
Any Disorder	**42**	**37.50**	**17**	**23.29**	**4.11***	**1.66 (0.72-3.84)**

Note. *p < .05; **p < .01; NOS= Not Otherwise Specified

[2] Adjusted odds ratios (OR) and 95% confidence intervals (CI) were calculated using logistic regression analyses, controlling for degree of overweight and socio-economic status, with the non-referred group as reference.

[3] A Likelihood Ratio Test was performed.

Table 2. *Means, standard deviations en Cronbach's alphas for the referred and the non-referred obese youngsters on all questionnaires administered and the EDE subscales.*

	α	Referred M (SD)	Non-referred M (SD)	F^4
Children's Depression Inventory	.86	12.70 (7.17)	10.63 (6.15)	3.84*
Spence Children's Anxiety Scale				1.89
Separation Anxiety Disorder	.71	3.94 (3.09)	3.19 (2.86)	
Social Anxiety Disorder	.69	5.03 (3.22)	5.53 (3.22)	
Obsessive Compulsive Disorder	.77	3.28 (3.08)	3.67 (3.31)	
Panic disorder/Agoraphobia	.78	3.58 (3.50)	3.86 (4.01)	
Fear of Physical Injury	.47	3.24 (2.54)	3.87 (2.60)	
Generalized Anxiety Disorder	.72	5.22 (2.91)	5.53 (3.46)	
Total Anxiety Score	.91	24.29 (14.24)	25.66 (15.07)	
Eating Disorder Examination				1.62
Restraint	.60	5.63 (5.46)	6.34 (5.34)	
Eating Concern	.57	3.09 (3.59)	2.29 (3.57)	
Weight Concern	.64	10.14 (5.22)	9.16 (5.44)	
Shape Concern	.81	16.42 (8.92)	13.96 (10.68)	
Youth Self Report				1.82
Internalizing problems	.87	61.27 (10.82)	57.62 (11.74)	
Externalizing problems	.83	56.07 (10.43)	54.00 (8.82)	
Child Behavior Checklist				4.86**
Internalizing problems	.90	63.62 (11.58)	58.82 (9.86)	7.97**
Externalizing problems	.92	58.96 (12.61)	58.15 (12.47)	0.17

*Note. *p < .05; **p < .01*

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[4] Displayed F-values and significance levels do not take into account differences in degree of overweigt and socio-economic status between referred and non-referred overweight youngsters.

Chapter 3

Mental disorder, symptom severity and weight loss in inpatient adolescent obesity treatment[1]

This study aimed to investigate whether mental disorders and symptom severity hamper weight loss in obese adolescents and explored the effect of evidence-based adolescent obesity treatment on mental disorders and symptom severity. Participants were 66 adolescents admitted for a 10-month obesity treatment programme. It was found that baseline degree of overweight was the strongest predictor of weight loss. The presence of at least one mental disorder appeared a negative predictor of weight loss after four months. At post-test, a decrease in eating, shape and weight concern and binge eating episodes was demonstrated. A similar trend was found for internalizing symptoms. All eating disorders resolved, but a substantial number of adolescents still suffered from mental disorders at the end of treatment. All together, the findings of this study demonstrate the importance of adopting both a medical and a psychological perspective on obesity (treatment) in youth.

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[1]   Van Vlierberghe, L., Braet, C., Goossens, L., Rosseel, Y., & Mels, S. (in revision). Mental disorder, symptom severity and weight loss in inpatient adolescent obesity treatment. *International Journal of Pediatric Obesity*.

Introduction

Research has demonstrated the effectiveness of multi-component paediatric obesity treatment (Goldfield, Raynor, & Epstein, 2002). However, some obese youngsters do not seem to benefit fully from this approach (see e.g.: Braet, Tanghe, Decaluwe, Moens, & Rosseel, 2004). Investigating patient characteristics should enable to screen out youngsters with low probability of success and refer them for specialized treatment.

Referred obese youngsters often suffer from comorbid psychopathology (for a review, see: Zametkin, Zoon, Klein, & Munson, 2004). Epstein, Wisniewksi and Wing (1994) demonstrated that child anxiety and depression symptoms at the beginning of treatment were negatively related to weight loss during treatment. Braet and Van Winckel (2000) found no differences between youngsters with and without psychological symptoms regarding weight loss at one year and 4.6 year follow-up. Likewise, Braet (2006) demonstrated that a general indicator of psychological symptomatology at the beginning of treatment was not predictive for weight loss at two year follow-up.

Research further suggests that childhood obesity is a risk factor for eating disorders in adulthood (Fairburn et al., 1998; Fairburn, Welch, Doll, Davies, & O'Connor, 1997). When compared with normal weight controls, non-referred overweight youngsters report more concerns about weight, shape and eating and attempt dietary restraint more often (Burrows & Cooper, 2002; Tanofsky-Kraff et al., 2004). Levine, Ringham, Kalarchian, Wisniewski and Marcus (2006) demonstrated that shape concern was positively related to weight loss at the end of treatment. On the contrary, Braet (2006) found eating disorder symptoms at the start of treatment to be a negative predictor of weight loss at two year follow-up. It has not been investigated whether mental disorders in general and eating disorders in particular affect weight loss during obesity treatment in youth.

Studies on the effectiveness of obesity treatment should evaluate both weight loss and psychosocial outcome (Jelalian & Saelens, 1999; Zametkin et al., 2004). Research indicates a decrease in symptoms of internalizing but not externalizing problem behaviour immediately after obesity treatment (Braet et al., 2004; Levine, Ringham, Kalarchian, Wisniewski, & Marcus, 2001) and at one (Braet et al., 2004; Myers, Raynor, & Epstein, 1998) and two year follow-up (Epstein, Paluch, Saelens, Ernst, & Wilfley, 2001). Some authors have argued that putting obese individuals on a diet and stimulating physical activity might increase the risk of eating disorders (Herman & Polivy, 1980). However, in their review of five treatment effect studies, Butryn and Wadden (2005) demonstrated that treatment of overweight in youth does not lead to increased eating disorders symptoms. Braet and colleagues (2004) found a significant decrease in binge eating and eating, weight and shape concern immediately after treatment and at 14 months follow-up. No studies investigated the course of mental disorders (including eating disorders) during obesity treatment in youth.

The literature on weight loss in overweight adolescents is less developed than that with children (Jelalian & Saelens, 1999). Research by Epstein and colleagues (Epstein et al., 2001; Epstein et al., 1994; Myers et al., 1998) and Levine and colleagues (2001; 2006) has focused exclusively on children in primary school. Furthermore, comparison of results is hampered as studies diverge regarding the time point at which weight loss and psychological adjustment are evaluated. Finally, there is not a single study that has used a structured clinical interview for the assessment of mental *disorders*. Therefore, this study investigated whether mental disorders and symptom severity relate to weight loss (research question 1) and how mental disorders as well as symptom severity evolve during obesity treatment (research question 2) in overweight adolescents.

Method

Participants

Participants were 66 overweight adolescents (44 girls; 22 boys) admitted for inpatient obesity treatment with a mean age of 15.11 years ($SD = 1.15$; range 14-18). According to Hollingshead four factor index of socioeconomic status (SES: Hollingshead, 1975), 3.0% of the youngsters' families was in upper middle, 51.5% in middle, 40.9% in lower middle and 1.5% in lower social class. One adolescent permanently lived in an institution and from one youngster, no information on SES was obtained.

The subsample of youngsters participating in the evaluation of psychopathology at the end of treatment consisted of 31 overweight youngsters (20 girls; 11 boys) with a mean age of 15.23 years ($SD = 1.23$; range 14-18) at the beginning of treatment. According to Hollingshead four factor index of (SES), 35.5% of the youngsters' families was in middle, 61.3% in lower middle and 3.2% in lower social class.

The obesity treatment centre is a recognised institute for treatment of children with chronic disease. All youngsters are treated as inpatients, with a school allied to the centre. Youngsters are allowed to turn home for the weekend twice a month. For the other two weekends and for half of the holidays, the youngsters remain in the centre. A 10 month non-diet healthy life style programme is used in which children learn to make healthy food choices at fixed times during the day in combination with daily physical activities, necessary for a healthy body weight. Cognitive-behavioural techniques are considered important tools in changing behaviour and were therefore integrated as part of the programme. A detailed description of the treatment programme is given elsewhere (Braet et al., 2004).

Instruments

Weight and height were registered at the start of the programme (baseline), after one month, after four months and at the end of treatment. Assessment was done by a paediatrician with calibrated instruments. Each time, percentage overweight (adjusted BMI) [(actual BMI/ Percentile 50 of BMI for age and gender) x 100] was calculated, based on normative data (Fredriks, van Buuren, Wit, & Verloove-Vanhorick, 2000). Weight loss was expressed as a change score. The formula for weight loss after one month was (baseline adjusted BMI minus adjusted BMI after one month), for weight loss after four months it was (baseline adjusted BMI minus adjusted BMI after four months) and for weight loss at the end of treatment it was (baseline adjusted BMI minus adjusted BMI at the end of treatment). Finally, to facilitate comparison of weight parameters across (international) samples, CDC BMI-z scores (Ogden et al., 2002) at the start of treatment were calculated and the percentage of participants classified as overweight and obese on the basis of the IOTF BMI cut-off points (Cole, Bellizzi, Flegal, & Dietz, 2000) was determined.

The Structured Clinical Interview for DSM-IV - Childhood version (KID-SCID: Hien et al., 1994) is an interviewer-based semi-structured instrument to generate childhood DSM-IV diagnoses for clinical research studies, which is based on the SCID for adults (Williams et al., 1992). Several studies provide support for the reliability and the validity of the child interview (Matzner, 1994; Matzner, Silva, Silvan, Chowdhury, & Nastasi, 1997; Smith, Huber, & Hall, 2005; Timbremont, Braet, & Dreessen, 2004). To assure interrater reliability of diagnoses, we conducted a pilot study on the KID-SCID in 36 youngsters. Interviews were taped and, besides by the interviewer, scored by two independent raters (108 ratings). Cohen's κ ranged from .79 and 1, suggesting excellent agreement.

The Youth Self Report (YSR: Achenbach & Edelbrock, 1987) assesses several emotional and behavioural problem areas as reported by the adolescent.

A global internalizing and externalizing problem score can be obtained. The Dutch version of the YSR is a reliable and valid instrument for the assessment of psychological symptoms in youth (Verhulst, Van der Ende, & Koot, 1997). Based on data from a large community sample of Dutch children and adolescents, T-scores can be computed.

The Eating Disorder Examination – Child version (ChEDE: Bryant-Waugh, Cooper, Taylor, & Lask, 1996) is derived from the EDE for adults (Fairburn & Cooper, 1993), a standard investigator-based interview generating, among other things, DSM-IV (American Psychiatric Association, 1994) eating disorder diagnoses. To this end, the (Ch)EDE assesses the presence and frequency of different forms of overeating, including binge eating episodes and compensatory behaviour over a 3-month period. Several studies have demonstrated the reliability and validity of the ChEDE (Decaluwe & Braet, 2004; Glasofer et al., 2007; Tanofsky-Kraff et al., 2004; Watkins, Frampton, Lask, & Bryant-Waugh, 2005). For the purpose of this study, binge eating was defined as the presence of at least one objective bulimic episode during the past three months. The Oxford definitions of BN and BED (Fairburn & Cooper, 1993) were used.

The Eating Disorder Examination-Questionnaire (EDE-Q: Fairburn & Beglin, 1994). is derived from the EDE and contains, among other things, four subscales: restraint, eating concern, shape concern and weight concern. Whereas the ChEDE is considered superior for the assessment of binge eating episodes, the four subscales can be measured reliably with the EDE-Q (Decaluwe & Braet, 2004). For the present study, it was therefore decided to measure the presence of eating disorders and binge eating with the ChEDE and rely on the EDE-Q for the assessment of restraint and eating, weight and shape concern.

Procedure

The institutional review board of Ghent University approved the protocol of this study. Participants were between 14 and 18 years of age. All adolescents were diagnosed as being primary overweight, defined as BMI > 95th percentile, and were referred by medical doctors after outpatient treatment had failed. The referees were asked to complete a written declaration specifying the medical advice they had been giving in the past as well as their reason for the referral. Exclusion criteria were mental retardation and the presence of developmental syndromes like Prader-Willi and Pervasive Developmental Disorder (PDD). Informed consent was obtained from both children and parents. Interviews and questionnaires were administered by trained psychologists or trained psychology students. Interviewers were blind to scores on self-report questionnaires. Questionnaires and interviews were administered randomized on different days to avoid order effects.

Data were gathered during a two year study period (2004-2006). Firstly, each time in January and July, all eligible youngsters who were recently (i.e., for no longer than two weeks) admitted to the treatment centre, were invited to participate. Across the four time points, 76 adolescents met the inclusion criteria. Four youngsters (5.3%) dropped out of the study for organisational reasons (pre-test drop-outs). Six (7.9%) adolescents left the programme untimely (non-completers): one boy left the centre at his own request but against the advice of the medical staff, three were sent away because of severe externalizing problem behaviour and two siblings were dismissed as their father was unable to pay for treatment. Drop-outs and non-completers were omitted from analyses as we were interested in mental disorders and symptom severity in completers. Hence, as a result, 66 adolescents were finally included in the study (research question 1). Secondly, all youngsters who had enrolled the clinic in July 2005 (n=30) and January 2006 (n=9) were selected for participation in the psychopathology follow-up study at the end of treatment. Hence, 39 adolescents were selected.

However, in this subsample, five youngsters belonged to the non-completers, one belonged to the pre-test drop-outs and two youngsters dropped out at post-test. As a result, 31 adolescents were finally included in the follow-up study (research question 2). During the last week of their stay, the remaining adolescents were interviewed again and questionnaires were administered once more. Due to organisational difficulties, five youngsters could only be inquired when they had already left the centre. Therefore, we repeated the analyses of the follow-up study while excluding these five adolescents. As the analyses led to the same conclusions, it was decided to keep these participants in the analyses. A flow chart of participants throughout the treatment and the study is provided in Figure 1.

To leave no doubt, it should be noted that we confined the follow-up part of the study to about half of the initial sample only because of financial and time constraints. We randomly selected two pre-test intakes, i.e. July 2005 and January 2006, and included these youngsters in the follow-up part of the study. Hence, the only selection criterion for participation at follow-up was the moment of intake in the treatment programme. Moreover, the youngsters included in the follow-up study had precisely the same check-ups regarding weight and height as the adolescents that were not included in the follow-up.

Missing data and data analysis

To investigate the predictive value of psychopathology for weight loss during obesity treatment (research question 1), three regression analyses were run, with respectively weight loss after one month, weight loss after four months and weight loss at the end of treatment as the dependent variables. Gender (0=boy, 1=girl), baseline adjusted BMI, psychological symptoms (EDE-Q and YSR subscales) and the presence of at least one psychiatric diagnosis (0=no mental disorder, 1=at least one mental disorder) were included as the independent variables. To investigate the evolution of symptoms during obesity

treatment (research question 2), paired sample t-tests were conducted for the YSR and EDE-Q subscales.

Overall, 12.1% of the data used in the statistical analyses was missing, mainly because of incomplete questionnaires. Missing values were estimated using multiple imputation[2] (Schafer, 1997). In the commonly used statistical software packages such as SPSS, it is not possible to estimate missing data by multiple imputation. Therefore, analyses were done in R, a free software environment for statistical computing and graphics (The R Development Core Team, 2008). More specifically, the library for multivariate imputation by chained equations (Van Buuren, Boshuizen, & Knook, 1999; Van Buuren & Oudshoorn, 2000) in R was used.

Results

Descriptive statistics: weight parameters and mental disorders (n=66)

The mean adjusted BMI of the participants at the start of the treatment programme was 180.9% (*SD* = 23.5; range 139.6-256.0) and the mean CDC BMI z-score was 2.25 (*SD* = 0.28; range 1.58-2.99). On the basis of the IOTF BMI cut-off points, 4.5% of the adolescents was classified as overweight and 95.5% as obese.

Twenty-nine (45.3%) youngsters received one or more psychiatric diagnoses. Four (6.3%) youngsters were diagnosed with at least one disruptive behaviour disorder, four (6.3%) with at least one mood disorder, 13 (20.3%) with at least one anxiety disorder and 10 (15.2%) with at least one eating disorder. There were 22 subjects (34.4%) with one diagnosis, 6 with two diagnoses (9.4%) and 1 with four diagnoses (1.6%). Binge eating was found in

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[2]   When using MI to estimate missing data, the degrees of freedom obtained in the statistical analyses can be surprising (Little & Rubin, 1987). For example, in linear regression, only one set of degrees of freedom (r1) is given and degrees of freedom when using MI are typically non-integer (expressed as decimal fractions).

30.3% of the participants. Mean number of reported binge eating episodes during the past three months was 5.80 (SD = 15.64, range 0-90).

Mean percentage weight loss was 13.4% (SD = 5.2; range 1.6 - 37.4) after one month, 36.9% (SD = 10.6; range 13.1 - 65.1) after four months and 52.5% (SD = 18.2; range 18.2 - 107.4) at the end of treatment. The mean adjusted BMI of the participants at the end of treatment was 128.4% (SD = 13.9; range 104.5-177.2).

Psychopathology as a predictor of weight loss (n=66)

For weight loss after one month, baseline adjusted BMI appeared a significant predictor, $t(48.6)$ = 2.49, p < .05. For weight loss after four months, gender, $t(52.3)$ = -2.19, p < .05, adjusted BMI, $t(53.2)$ = 6.74, p < .001, and the presence of at least one psychiatric diagnosis, $t(46.5)$ = -2.30, p < .05, appeared predictive. For weight loss at the end of treatment, only baseline adjusted BMI was predictive, $t(51.5)$ = 9.91, p < .001.

Course of psychopathology during obesity treatment (n=31)

Paired sample t-tests revealed that treatment did affect neither restraint, $t(26.3)$ = -1.63, p = .12, nor externalizing problem behaviour symptoms, $t(26.4)$ = -0.53, p = .60. A significant decrease in eating concern, $t(27.4)$ = 2.26, p < .05, shape concern, $t(25.8)$ = 3.25, p < .01, and weight concern, $t(22.1)$ = 3.90, p < .001 was demonstrated. A similar trend was found for internalizing problem behaviour symptoms, $t(27.2)$ = 1.75, p = .09. There was a significant decrease in the number of reported binges, $t(30)$ = 2.35, p < .05. At the end of treatment, four youngsters (12.9%) still reported subclinical binge eating.

Table 1 provides an overview of pre-test and post-test psychiatric diagnoses. As can be seen, all eating disorder diagnoses resolved. Overall, whereas at pre-test 53.3% of the youngsters suffered from at least one mental disorder, at post-test 30.0% received a mental disorder diagnosis. In Table 2 the course of psychiatric diagnoses is depicted for each individual separately. When

youngsters entered obesity treatment with a mental disorder, there was a 43.8% chance of keeping at least one psychiatric diagnosis. When they entered treatment free from diagnoses, there was 85.7% chance of keeping this status.

Discussion

Although psychopathology is prevalent in referred overweight children and adolescents, few studies have investigated how mental health interferes with obesity treatment in youth (Jelalian, Wember, Bungeroth, & Birmaher, 2007). Hence, the first aim of this study was to investigate whether psychological symptoms and mental disorders are associated with weight loss during obesity treatment in youngsters between 14 and 18 years of age. First of all, in line with former research (see e.g.: Braet, 2006), baseline degree of overweight strongly predicted weight loss. Hence, severely overweight youngsters are often most successful in losing weight. Also, after four months, boys had lost more weight than girls. Overall, psychopathology was not found to significantly predict weight loss, which parallels extensive research in overweight adults (Teixeira, Going, Sardinha, & Lohman, 2005). However, one exception to the rule should be mentioned here: the presence of at least one mental disorder showed negative predictive value for weight loss four months after the start of the programme.

The second goal of the study was to investigate how adolescents' psychological symptoms and mental disorders evolve during obesity treatment. In line with earlier studies, an overall decrease in eating disorder pathology and internalizing but not externalizing symptoms was found. Due to the overall decrease in reported binge eating episodes, all eating disorder diagnoses resolved. However, about 50% of the adolescents entering treatment with at least one mental disorder, kept at least one psychiatric diagnosis at the end of the programme.

The assessment of post-treatment psychopathology was deliberately done just before the participants left the treatment centre. Diathesis-stress

perspectives on psychopathology (Hankin & Abela, 2005) assume that emotional problems originate from and are maintained through the interaction of current stressful experiences and pre-existing vulnerabilities. It could be assumed that leaving the centre enhances stress and consequently increases the risk of psychopathology. Therefore, it is important to know the mental status of the youngsters before they leave the programme. This study is the first to establish preliminary estimates of mental disorders in youngsters who completed obesity treatment and these can now serve as a guideline for future research, for example on how psychopathology relates to weight *maintenance*.

Besides limited weight loss, non-completion is another source of concern in treatment of obese children and adolescents. Few studies focused on psychopathology as predictor of attrition. Zeller and colleagues (2004) found that non-completers reported more depressive symptomatology and were described by their primary caregiver as exhibiting significantly more externalizing or disruptive behavioural difficulties compared with completers. In the present study, six youngsters left the programme untimely, against the advice of the medical staff. As these youngsters also went through pre-treatment assessment, it could be established that three of them suffered from at least one mental disorder. Obviously, the number of non-completers with and without disorders in this study is far too small to draw any conclusion on this matter. However, it is noteworthy that each of these three adolescents suffered from two or more mental disorders, including oppositional defiant disorder (ODD) or conduct disorder (CD). Hence, we could put forward the preliminary hypothesis that the co-occurrence of more than one psychiatric diagnosis or, in line with findings by Zeller et al. (2004), that the presence of externalizing problem behaviour is a risk factor for non-completion in obesity treatment. Creating a psychosocial profile of obese youngsters with a high risk of attrition will now require large samples of referred obese youngsters to investigate these hypotheses. In this regard, it should be noted that when in the study by Zeller

and colleagues (2004) all assessed variables differentiating significantly between completers and non-completers were entered simultaneously in a multivariate analysis, only race, age, insurance type and self-reported depressive symptomatology remained significant independent predictors. Hence, considering the role of psychological variables alone might not sufficiently capture the multifaceted reasons for non-adherence to treatment. As such, the role of demographic factors, degree of overweight and psychopathology should be considered simultaneously to determine their unique contribution in predicting drop-out in childhood and adolescent obesity treatment.

In this study, we explicitly focused on adolescents, which is a largely neglected age group in research on obesity treatment outcome. A prospective design with objective weight measures was used. Moreover, effectiveness was not simply evaluated in terms of weight loss but also included post-treatment psychological symptoms and mental disorders. This is the first study on obesity treatment effects in youth that made use of structured clinical interviews, currently known as the 'gold standard' for assessment of psychiatric disorders. Special attention was given to state-of-the-art assessment of eating disorders. However, as youngsters can be undiagnosed but impaired (Angold, Costello, Farmer, Burns, & Erkanli, 1999) it was decided to adopt a multi-method format including self-report questionnaires also. Because the EDE and the KID-SCID are investigator-based interviews, shared method variance due to a single informant perspective was partly controlled for.

The study is however limited because of its small sample size. Moreover, as only severely obese adolescents seeking *inpatient* treatment were included, the results cannot be generalized to the referred obese adolescent population as a whole. Finally, a limitation of the study is that psychopathology was only measured in the beginning and at the end of treatment. In future research, the assessment of psychological symptoms and disorders at different time points will enable to map more precisely to what extent and how

psychopathology changes during the course of treatment and how this evolution is related to weight loss.For clinicians, the finding that being female or suffering from mental disorders hinders weight loss 'halfway' treatment seems of particular interest. Because of weight loss failure, motivation in girls or in youngsters with mental disorders might decline during the course of treatment. Practitioners should encourage these adolescents to carry on (since they have the same favourable prognosis for weight loss at the end of treatment) and/or adopt specific therapeutic strategies to treat their mental problems. This study also indicates that in girls and in severely obese adolescents with mental disorders, treatment of short duration might result in an experience of failure. Hence, particularly in these youngsters, long-term care should be the aim.

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Tables and Figures

Figure 1. *Flow chart of participants throughout the treatment programme and the present study*
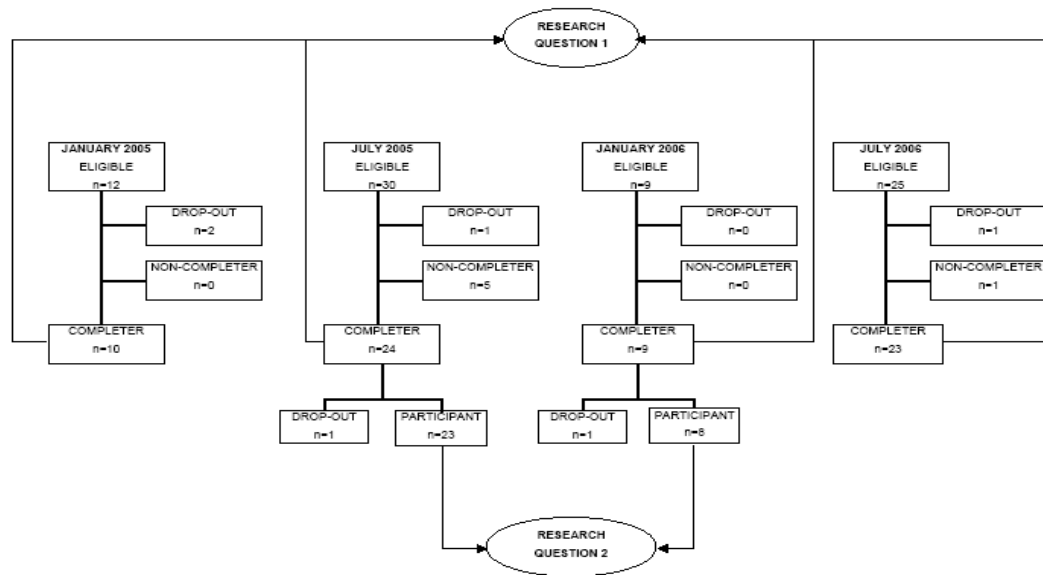
Table 1. *Overview of pre- and post-test mental disorders during adolescent obesity treatment*

	PRE-TEST		POST-TEST	
	N	*%*	*N*	*%*
- Attention Deficit Hyperactivity Disorder	0	0.0	0	0.0
- Oppositional Defiant Disorder	1	3.3	1	3.3
- Conduct Disorder	1	3.3	0	0.0
- Conduct Disorder - Not Otherwise Specified	0	0.0	0	0.0
Any disruptive behaviour disorder	**2**	**6.7**	**1**	**3.3**
- Major Depressive Disorder	1	3.3	2	6.7
- Manic episode	0	0.0	0	0.0
- Hypomanic episode	0	0.0	0	0.0
- Dysthymic Disorder	1	3.3	0	0.0
- Major Depressive Disorder –Not Otherwise Specified	1	3.3	0	0.0
Any mood disorder	**3**	**10.0**	**2**	**6.7**
- Separation Anxiety Disorder	0	0.0	0	0.0
- Social Phobia	0	0.0	1	3.3
- Specific Phobia	1	3.3	2	6.7
- Obsessive Compulsive Disorder	1	3.3	1	3.3
- Post Traumatic Stress Disorder	1	3.3	1	3.3
- Generalized Anxiety Disorder	0	0.0	0	0.0
- Panic Disorder	0	0.0	0	0.0
- Agoraphobia	0	0.0	0	0.0
- Anxiety Disorder – Not Otherwise Specified	3	10.0	0	0.0
Any anxiety disorder	**6**	**20.0**	**5**	**16.7**
- Adjustment Disorder	4	13.3	4	13.3
- Binge Eating Disorder	5	16.7	0	0.0
- Bulimia Nervosa	1	3.3	0	0.0
Any eating Disorder	**6**	**20.0**	**0**	**0.0**
Any Disorder[1]	**16**	**53.3**	**9**	**30.0**

Note. At pre-test, one girl refused to be interviewed. Hence, 30 youngsters were included; % = the percentage children or adolescents with that specific diagnosis.

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[1] I.e.: the number or percentage of youngsters suffering from <u>at least</u> one mental disorder. Youngsters suffering from comorbid diagnoses were only counted once.

Table 2. *Overview of course of mental disorders on an individual level at pre-and post-test during adolescent obesity treatm*

MENTAL DISORDER(S) PRE-TEST	MENTAL DISORDER(S) POST-TEST	*N*
None	None	12
Dysthymic Disorder	None	1
Adjustment Disorder	None	1
Anxiety Disorder NOS	None	1
Depressive Disorder NOS	None	1
Conduct Disorder	None	1
BED	None	3
Anxiety Disorder NOS/Adjustment Disorder	None	1
PTSD	PTSD/Major Depressive Disorder	1
Anxiety Disorder NOS	Social Phobia/Adjustment Disorder	1
Adjustment Disorder	Adjustment Disorder	1
Major Depressive Disorder/BN	Adjustment Disorder	1
Oppositional Defiant Disorder/BED	Oppositional Defiant Disorder	1
Obsessive Compulsive Disorder/BED	Obsessive Compulsive Disorder	1
Specific Phobia/Adjustment Disorder	Specific Phobia	1
None	Specific Phobia/Adjustment Disorder	1
None	Major Depressive Disorder	1

Note. NOS = Not Otherwise Specified; BED = Binge Eating Disorder; PTSD = Post Traumatic Stress Disorder; BN = Bulimia Nervosa;

Chapter 4

Dysfunctional schemas and eating pathology in overweight youth: A case control study[1]

This study aimed to investigate in overweight adolescents the association of dysfunctional schemas (negative basic beliefs about the self and one's relationships with others) on the one hand and eating disorder (ED) symptoms and depression on the other hand. Participants were 32 overweight adolescents experiencing loss of control over eating (LC) and 32 overweight youngsters experiencing no loss of control over eating (NoLC), matched on referral status, age, gender and degree of overweight. It was found that the LC group displayed a greater severity of dysfunctional schemas than the NoLC group. In the overweight group as a whole, maladaptive schemas were related to ED cognitions, dietary restraint attitudes and depressive symptoms. It can be concluded that in overweight youngsters, ED symptoms are associated with dysfunctional thinking patterns and negative affect.

Introduction

In the literature on overweight in youth, much attention has recently been paid to 'loss of control over eating' (LC). LC is prevalent among overweight youngsters and has been shown to be associated with degree of overweight, low self-esteem, anxiety, depression and the cognitive correlates of eating disorders (EDs), i.e., eating, weight and shape concern (Decaluwe & Braet, 2003; Eddy et al., 2007; Glasofer et al., 2007; Goossens, Braet, & Decaluwe, 2007; Tanofsky-Kraff, Faden, Yanovski, Wilfley, & Yanovski, 2005; Tanofsky-Kraff et al., 2004). Nowadays, LC is considered the most prominent aspect of binge eating in youth (Marcus & Kalarchian, 2003).

In the literature on EDs, Waller (2000) recently incorporated Young's cognitive theory (Young, Klosko, & Weishaar, 2003) and pointed to the central role of dysfunctional schemas (negative basic beliefs about the self and one's relationships with others) to explain binge eating in Bulimia Nervosa and Binge Eating Disorder. Young refined Beck's original cognitive theory (see e.g.: Beck, 1995) by providing a diversified taxonomy of maladaptive schemas that are different as regards content. Dysfunctional schemas are presumed to develop during childhood, on the basis of negative interactions with primary caregivers. During later life, schemas are triggered when an individual is confronted with stress. Waller (2000) considers binge eating as a compensatory mechanism to deal with the negative emotions that arise when schemas are activated. Within Young's framework, cross-sectional research in adults confirmed the presence of maladaptive schemas in individuals with EDs and the association of schemas and binge eating (e.g.: Waller, 2003; Waller, Ohanian, Meyer, & Osman, 2000).

In youth, studies have demonstrated that maladaptive schemas are associated with ED psychopathology (Muris, 2006) and overweight (Turner, Rose, & Cooper, 2005). The adult literature further suggests that in overweight individuals, dysfunctional schemas may be related to binge eating and to

depression (Anderson, Rieger, & Caterson, 2006; Nauta, Hospers, Jansen, & Kok, 2000). The current study builds on this growing body of literature by evaluating among overweight youth the relationship between maladaptive schemas on the one hand and ED psychopathology (LC, dietary restraint and eating, weight and shape concern) and depression on the other hand.

On the basis of recent findings in overweight adults and adults with EDs, it was firstly hypothesized that overweight youngsters experiencing LC would display a greater severity of maladaptive schemas as compared with overweight adolescents who do not report LC. Cognitive models on psychopathology in general (Beck, 1995; Young et al., 2003) and EDs in particular (Cooper, 2005; Fairburn, Cooper, & Shafran, 2003) altogether seem to suggest that maladaptive schemas precede the development of eating, weight and shape concerns, which in turn give rise to negative affect, dietary restraint and/or binge eating. Hence, on the basis of these etiological models, it was secondly hypothesized that in overweight youth, maladaptive schemas are positively correlated with eating, weight and shape concern, dietary restraint attitudes and depressive symptomatology.

Methods

Participants

Participants were 64 overweight adolescents with a mean age of 14.97 years (SD=1.52; range 12-18). There were 22 boys and 42 girls. Thirty-eight were referred for weight-loss treatment (treatment seekers) and 26 were non-referred (non-treatment seekers).

Measures

Weight and height were measured using calibrated instruments. The BMI (weight/height²) and the adjusted BMI [(actual BMI/ Percentile 50 of BMI for age and gender) x 100] were determined for each adolescent (Fredriks, van

Buuren, Wit, & Verloove-Vanhorick, 2000). To standardize BMI across (international) samples, BMI z-scores according to the CDC standards (Ogden et al., 2002) were also calculated.

Familial *socio-economic status* (SES) was calculated using the Hollingshead Index of Social Position (Hollingshead, 1975), based on parental education and occupation.

The *Eating Disorder Examination – Child version* (ChEDE: Bryant-Waugh, Cooper, Taylor, & Lask, 1996) is an investigator-based structured clinical interview that contains four subscales designed to provide a profile of individuals in terms of four major areas of ED symptoms: restraint, eating concern, shape concern and weight concern. In addition, the ChEDE assesses presence and frequency of different forms of overeating. Several studies have demonstrated the reliability and validity of the ChEDE (Decaluwe & Braet, 2004; Tanofsky-Kraff et al., 2004; Watkins, Frampton, Lask, & Bryant-Waugh, 2005). In this study, adolescents were categorized as having experienced LC when they mentioned at least one episode of objective (OBE: a large amount of food that other people would also qualify as large) or subjective (SBE: a large amount of food according to the child, but that other people would not qualify as large) *binge eating* over the last three months (see: Marcus & Kalarchian, 2003) Subjects who did not mention OBE's or SBE's over the last three months were ranked as having experienced NoLC. Consequently, youngsters who reported only objective or subjective *overeating* were ranked in the NoLC group, just like adolescents who reported neither binge eating nor overeating.

The *Young Schema Questionnaire* (YSQ: Young & Brown, 1990) – *Short Version* is a 75-item adult self-report questionnaire that assesses 15 early maladaptive schemas as identified by Young. Each item is phrased as a negative belief regarding self and one's relationships with others, to be rated on a Likert scale from 1 ('completely untrue of me') to 6 ('describes me perfectly').

The *Children's Depression Inventory* (CDI: Kovacs, 1992) assesses cognitive, affective and behavioural symptoms of depression in youth. The questionnaire has proved to be reliable and valid (Craighead, Smucker, Craighead, & Ilardi, 1998; Timbremont, Braet, & Dreessen, 2004).

Procedure

The institutional review board of Ghent University approved the study protocol. Questionnaires and interviews were held randomized on different days. All participants were between 12 and 18 years of age and diagnosed as being primary overweight (adjusted BMI above 120%). Exclusion criteria were mental retardation and the presence of developmental syndromes. Informed consent was obtained from both youngsters and their parents.

Treatment-seeking overweight youngsters were recruited via an obesity treatment centre. Data were gathered in consecutive waves during a two year study period: each time in January and July, all eligible youngsters who recently started the treatment, were invited to participate. Across the four waves, 65 overweight adolescents met inclusion criteria but seven dropped out. Participants completed all assessments during the first two weeks of admission.

Non-treatment seekers were recruited via advertisements in healthcare magazines (n=22) and via large-scale school mailings (n=42). Each time, the study was described as research into the psychosocial well-being of youngsters 'with a bigger size'. Youngsters meeting the general inclusion criteria were eligible when at the moment of the study they did not receive any 'treatment in order to lose weight with at least the help of a dietician'. Of those willing to participate, one adolescent received overweight treatment and was thus considered a treatment-seeker. All non-treatment seekers were aware that they would not receive any kind of treatment as part of the study.

Overall, 122 youngsters were questioned. In six youngsters, the administration of the ChEDE or the YSQ failed for organizational reasons.

These adolescents were omitted from further analyses. Thirty two (27.59%) youngsters experienced LC. In several studies, it was demonstrated that overweight youngsters experiencing LC tend to be heavier than overweight youngsters who do not report LC (e.g.: Goossens et al., 2007; Morgan et al., 2002; Tanofsky-Kraff et al., 2004). To avoid confounding effects of degree of overweight, referral status, age and gender, each member of the LC group was matched with a member of the NoLC group of the same gender, age, referral status and adjusted BMI-class (class1: 120 < adjusted BMI >140; class 2. 140 < adjusted BMI >160; class 3: 160 < adjusted BMI >180; class 4: > 180), which brought us to a total of 64 participants selected for the study. It was impossible to fully match on referral status. However, as a result of matching on degree of overweight, 71.88% of the cases also corresponded on referral status. In the selected sample, LC and referral status were not associated, $\chi^2(1) = 1.04$, $p = .31$. Overweight youngsters that were *not* selected for the study (n=52) did not differ significantly from those that were included on age, $F(1,114) = 3.02$, $p = .09$, SES, $F(1,112) = 0.13$, $p = .72$, or gender, $\chi^2(1) = 2.89$, $p = .09$. However, as expected, participants in the selected group displayed a higher degree of overweight, $F(1,114) = 9.39$, $p < .01$, and were more likely to be treatment-seeking, $\chi^2(1) = 8.19$, $p < .01$.

Statistical Analyses

Univariate Analyses of Variance (ANOVA's) were used to determine differences between the LC group and the NoLC group regarding the severity of maladaptive schemas. Pearson correlation coefficients were calculated to examine associations between dysfunctional schemas on the one hand and dietary restraint attitudes, eating, weight and shape concern and depressive symptoms on the other hand.

Results

Sample characteristics by group are presented in Table 1. As expected, both groups did not differ on age, gender, degree of overweight, SES and referral status. The LC group scored significantly higher for dietary restraint and eating, weight and shape concern, but not for depressive symptoms.

ANOVA's revealed that the LC-group displayed greater severity of maladaptive schemas as compared with the NoLC-group (see Table 2). More specifically, the LC-group scored significantly higher for the schemas Abandonment/Instability, Mistrust/Abuse, Social Isolation/Alienation, , Failure to Achieve, Subjugation and Unrelenting Standards/Hypercriticalness.

In Table 3, correlations between maladaptive schemas, dietary restraint attitudes, eating, weight and shape concern and depressive symptoms are depicted. As can be seen, support was found for the hypothesis that dysfunctional schemas are positively associated with restraint, eating and shape concern and depressive symptoms.

Discussion

In line with earlier research (Eddy et al., 2007; Goossens et al., 2007; Tanofsky-Kraff et al., 2004), a subgroup of overweight youngsters in this study reported experiencing loss of control over eating. LC was associated with a greater severity of maladaptive schemas. More specifically, it was demonstrated that youngsters suffering from LC believe to a larger extent that others abuse and mistreat (Mistrust/Abuse schema) and that close attachments terminate (Abandonment/Instability schema), that they are isolated from the world, different from other people (Social Isolation/Alienation schema) and unable to perform well relative to others (Failure to Achieve schema) and that they must submit to the control of others to avoid negative consequences (Subjugation schema) and meet unrealistically high standards (Unrelenting Standards/Hypercriticalness schema). Secondly, in overweight youth, significant

correlations were found between maladaptive schemas on the one hand and specific ED cognitions, dietary restraint attitudes and depressive symptoms on the other hand. From a mental health perspective, the findings indicate that in overweight adolescents, cognitive behavioural therapy (CBT) might be useful for those suffering from ED pathology.

In her cognitive developmental vulnerability-stress model of EDs, Cooper (2005) formulated some hypotheses on the mechanisms through which maladaptive schemas (that are general beliefs common to many disorders) get connected with the ED cognitions that subsequently lead to ED behaviour. Cooper postulates that some specific ED beliefs develop, just like dysfunctional schemas, in the context of maladaptive early parental relationships. However, the author also acknowledges the importance of relationships with peers (e.g.: teasing or bullying) and the surrounding culture (e.g.: the media). In overweight youth, both familial adversity (e.g.: Lissau & Sorensen, 1994; Trombini et al., 2003) and social stigmatization (Puhl & Latner, 2007) have been demonstrated. Hence, the presence of maladaptive schemas and ED beliefs in overweight youth is not surprising.

In cognitive theory it is assumed that the activation of schemas leads to emotional dysregulation and inadequate coping. However, the mechanisms through which the activation of a maladaptive schema eventually leads to a binge eating episode in overweight youngsters suffering from LC, are not clear yet. Cross-sectional and longitudinal studies should aim at disentangling these. Further, the few studies that investigated the association of ED symptoms and weight loss in overweight youth, have shown mixed results (Braet, 2006; Levine, Ringham, Kalarchian, Wisniewski, & Marcus, 2001). More research on this topic is needed, so firm conclusions can be drawn and the possible utility of schema theory for obesity treatment in youth can be explored. Finally, retrospective studies have demonstrated that being overweight during childhood is a risk factor for the development of EDs in adulthood (Fairburn & Harrison,

2003). In longitudinal research, it should be investigated whether in overweight youngsters with ED symptoms, dysfunctional schemas chronically disturb emotions and behaviour.

It should be acknowledged that in the present study, not any of the maladaptive schemas correlated with weight concern. We hypothesize that in overweight youth, concerns about weight are most strongly associated with being obese, and not so much with (ED) psychopathology. Further, five schemas were unrelated to any form of ED pathology. Two of these (Dependence/Incompetence and Enmeshment/Undeveloped Self schema) were not associated with ED symptoms in (the community sample in) Muris' study (2006) either. In line with cognitive theory's content-specificity hypothesis (see e.g.: Clark, Beck, & Alford, 1999), these findings suggest that ED pathology might be characterized by a unique cognitive profile.

Strengths of the study include the use of a structured clinical interview for the assessment of ED symptoms. Further, both treatment- and non-treatment-seeking youngsters were questioned, which enhances generalizability of the results. Finally, because of the case control design, differences between the LC and the NoLC group cannot be attributed to confounding effects of age, gender, degree of overweight and referral status. The study is limited because of the small sample size. Further, its cross-sectional design prevents us from drawing any conclusion on the temporal association of schemas, negative affect, ED beliefs and binge eating.

On the basis of the correlations presented in Table 3, it could be argued that the association between maladaptive schemas and depressive symptoms is more compelling than the one between schemas and ED pathology. It should first of all be noted that relative to those between schemas and ED pathology, the correlations between schemas and depression might be inflated because of shared method variance. Secondly, it is generally acknowledged that a negative view of self is the cognitive core characteristic of depression (Beck, 1995).

Nevertheless, one could question whether the established correlations between schemas and ED pathology would still persist when the effects of depressive symptoms were partialled out. To investigate this, we re-conducted the analyses on the association of ED symptoms and schemas while controlling statistically for possible confounding effects of depression. It was found that a substantial number of effects remained significant or became trend significant. Hence, it seems justified to state that the established associations between schemas and ED symptoms can not solely be attributed to the influence of negative affect and that Young's schema theory might have specific added value to understand ED pathology in overweight youth.

Acknowledgements

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Tables

Table 1. *Subject characteristics (unless otherwise indicated M ± SD)*

	α	LC group (n = 32)	NoLC group (n = 32)	*F*-value
Female, % (*n*)		65.63 (21)	65.63 (21)	
Age (year)		14.97 ± 1.53	14.97 ± 1.53	
Adjusted BMI		173.56 ± 30.54	168.73 ± 27.99	0.43
BMI z-score		2.08 ± 0.45	2.02 ± 0.41	0.32
Socio-economic status		46.78 ± 10.92	44.05 ± 10.14	1.05
Treatment seekers, % (*n*)		65.63 (21)	53.13 (17)	
ChEDE restraint	.57	7.41 ± 5.56	4.81 ± 4.72	4.04*
ChEDE eating concern	.67	5.19 ± 5.26	1.75 ± 2.64	10.93**
ChEDE weight concern	.72	11.55 ± 4.58	8.59 ± 6.21	4.69*
ChEDE shape concern	.83	21.59 ± 9.12	12.59 ± 8.92	15.93***
CDI	.85	13.24 ± 6.42	10.88 ± 6.72	1.97

Note. LC = Loss of control eating; NoLC = No loss of control eating; ChEDE = Eating Disorder Examination – Child version; CDI = Children's Depression Inventory; *p < .05; **p <= .01; ***p < .001.

Table 2. *Means on maladaptive schemas and differences between the LC and the NoLC group*

	α	LC group M ± SD	NoLC group M ± SD	F-value
Emotional Deprivation	.83	2.16 ±1.16	1.67 ± 0.82	3.80
Abandonment/Instability	.88	3.36 ± 1.44	2.65 ± 1.20	4.64*
Mistrust/Abuse	.83	2.73 ± 1.14	2.15 ± 0.89	5.09*
Social Isolation/Alienation	.92	2.75 ± 1.34	1.97 ± 1.25	5.90*
Defectiveness/Shame	.87	2.19 ± 1.10	1.79 ± 1.00	2.38
Failure to Achieve	.88	2.53 ± 1.21	1.95 ± 0.90	4.70*
Dependence/Incompetence	.76	2.13 ± 0.82	1.98 ± 0.93	0.45
Vulnerability to Harm or Illness	.80	2.63 ± 1.22	2.17 ± 0.92	2.80
Enmeshment/Undeveloped Self	.66	2.38 ± 1.07	2.09 ± 0.87	1.43
Entitlement/Grandiosity	.59	2.29 ± 0.63	2.00 ± 0.79	2.70
Insufficient Self-Control/Self-Discipline	.75	2.91 ± 0.95	2.53 ± 0.97	2.51
Subjugation	.79	2.62 ± 1.07	2.06 ± 0.82	5.39*
Self-Sacrifice	.85	3.66 ± 1.14	3.50 ± 1.89	0.30
Emotional Inhibition	.81	2.84 ± 1.09	2.46 ± 1.08	1.96
Unrelenting Standards/Hypercriticalness	.74	3.03 ± 1.09	2.36 ± 0.79	7.87**

Note. $* = p < .05$; $**p <= .01$

Table 3. *Correlations between dysfunctional schemas, dietary restraint, eating, weight and shape concern and depressive symptoms*

	ChEDE Restraint	ChEDE Eating concern	ChEDE Weight concern	ChEDE Shape concern	CDI
Emotional Deprivation	.25*	.41***	.23	.28*	.53***
Abandonment/Instability	.20	.35**	.13	.24*	.35**
Mistrust/Abuse	.27*	.36**	.17	.31**	.53***
Social Isolation/Alienation	.12	.24*	.13	.21	.62***
Defectiveness/Shame	.25*	.32**	.08	.20	.57***
Failure to Achieve	.26*	.36**	.16	.24*	.56***
Dependence/Incompetence	.11	.01	-.08	-.05	.47***
Vulnerability to Harm or Illness	.00	.35**	.13	.21	.39**
Enmeshment/Undeveloped Self	.01	.02	.03	.03	.32**
Entitlement/Grandiosity	.33**	.12	.14	.12	.42***
Insufficient Self-Control	.06	.11	.08	.06	.59***
Subjugation	.21	.39***	.10	.21	.49***
Self-Sacrifice	-.13	.16	.12	.18	.21
Emotional Inhibition	.00	.21	.02	.06	.42***
Unrelenting Standards	.22	.18	.12	.12	.47***

Note. ChEDE = Eating Disorder Examination – Child version; CDI = Children's Depression Inventory; *p* < .05; **p* <= .01; ***p* <= .001

Chapter 5

Dysfunctional schemas and psychopathology in referred obese adolescents[1]

Referred obese adolescents often display psychological problems. This study aimed to investigate whether Young's schema theory constitutes a comprehensive framework to understand psychopathology in youth in general and in referred obese adolescents in particular. In total, 91 youngsters referred for obesity treatment and 91 normal weight controls (all between 12 and 18 years of age) particpated. It was found that 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. It can be concluded that referred obese individuals display high levels of maladaptive schemas and these are generally related to internalizing and externalizing symptoms.

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[1] Van Vlierberghe, L., & Braet, C. (2007). Dysfunctional schemas and psychopathology in referred obese adolescents. *Clinical Psychology & Psychotherapy, 14*, 342-351

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, & Cartercampbell, 1994), these authors consider overeating in bulimia nervosa (BN) and binge eating disorder (BED) 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 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, 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, Rose and Cooper (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. Generalisation of the latter findings is however hampered by a small sample size (n=46) and the sole inclusion of 17 to 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 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 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 characterised by low agreement of informants (Achenbach, Mcconaughy, & Howell, 1987). In a clinical sample of obese youngsters, Zeller and colleagues (2004) demonstrated that, when relying on self-report, 38.9% of the adolescents was 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 ($p < .001$) and depression ($p < .001$) while the association with internalizing problems as reported by the mother was more modest ($p < .01$). 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 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 (PCA) 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 (*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, $F(1,180) = 0.21$, $p = .65$ and gender was equally distributed, $\chi^2(1) = 0.02$, $p = .88$ 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 Body Mass Index (Adjusted BMI = Actual BMI/Percentile 50 of BMI for age and gender x 100) was calculated for each participant with reference to the European BMI values for 0 to 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 as 'at risk for overweight' and youngsters at or above the 95th percentile 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, youngster's families are categorised as belonging to upper, upper middle, middle, lower middle or lower social class.

The *Young Schema Questionnaire – Short Form* (YSQ: Young & Brown, 1990) 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 Form (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 alphas 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 both questionnaires assessing emotional and behavioural problem areas as reported respectively by parent and child. For 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 YSR's was not valid. In both cases, the score of the other informant substituted the 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 porgramme 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 (PDD). 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 porgramme. 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 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 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 weight status as factor was conducted. When an overall difference between the obese and the normal weight group was demonstrated, exploratory analyses of variance (ANOVA's) were done on an individual schema level. Next, the association of maladaptive schemas on the one hand and 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 α = .05, a desired power of .80 and a hypothesized conventional medium effect size (f^2 = .15), the MANOVA required a total sample size of 138 youngsters. For the hierarchical regression analyses, with α = .05, a hypothesized conventional medium effect size (f^2 = .15), 4 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 < .001.

According to Hollingshead four factor index of SES, 3.30% of the obese adolescents' families was 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 was 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, $F(1,176) = 0.10$, $p = .76$.

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 ANOVA's revealed that the obese group scored significantly higher for self-reported internalizing, $F(1,171) = 8.22$, $p < .01$, but not for externalizing, $F(1, 171) = 2.72$, $p = .10$, symptoms. The obese group scored significantly higher for internalizing, $F(1,134) = 57.36$, $p < .001$, and externalizing, $F(1, 134) = 17.96$, $p < .001$, 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, $F (15,158) = 1.85$, $p < .05$. The overweight group scored significantly higher for the schemas Emotional Deprivation, $F(1,172) = 4.67$, $p < .05$, Social Isolation/Alienation, $F(1,172) = 7.34$, $p < .01$, Defectiveness/Shame, $F(1,172) = 6.23$, $p = .01$, Failure to Achieve, $F(1, 172) = 7.78$, $p < .01$, Dependence/Incompetence, $F(1,172) = 6.12$, $p = .01$, and Subjugation, $F(1,172)$

= 3.97, p = .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 value 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 (VIF) 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 < .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, $R^2Change$ = .10, p <. 001. In block 3, the schema Social Isolation/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 < .001. Subsequently, the schema Vulnerability to Harm/Illness entered the equation, which again led to a significantly better prediction of the dependent variable, $R^2 Change$ = 0.04, p < .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 simultaneously. These control variables did not make a significant contribution to the model, $F(3,165)$ = 0.84, p = .48. In block 2, weight status was entered, leading to a significantly better prediction of

externalizing problem behaviour, $R^2 Change$ = .04, p = .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^2 $Change$ = 0.11, p < .001 and R^2 $Change$ = 0.03, p = .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 % 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. Secondly, 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 primary originate from negative early life experiences in the home environment (Beck, 1967; Beck et al., 1979). Young (Young et al., 2003) describes 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 and colleagues (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 (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 (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 (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 et al., 2004). Family characteristics relevant for childhood obesity (Baldaro et al., 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 quality of life in these children and their families (Vila et al., 2004). Moreover, in obesity treatment porgrammes, practitioners are faced with drop out 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 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 can not 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 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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Tables

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

	Obese group		Normal weight group		
	% at risk	*M (SD)*	% at risk	*M (SD)*	*F*
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***

Note. YSR = Youth Self Report; CBCL = Child Behaviour Checklist; % at risk = percentage of adolescents scoring equal to or above T = 63; **$p <= .01$; ***$p <= .001$

Table 2. *Means and standard deviations on maladaptive schemas and differences between the obese and the normal weight group*

	α	Obese group M (SD)	Normal weight group M (SD)	F
Emotional Deprivation	.76	2.04 (1.06)	1.73 (0.84)	4.67*
Abandonment/Instability	.86	2.87 (1.33)	2.52 (1.24)	3.27
Mistrust/Abuse	.76	2.46 (1.08)	2.20 (0.84)	3.01
Social Isolation/Alienation	.85	2.30 (1.34)	1.84 (0.87)	7.34**
Defectiveness/Shame	.74	2.10 (1.05)	1.74 (0.85)	6.23**
Failure to Achieve	.81	2.39 (1.13)	1.96 (0.93)	7.78**
Dependence/Incompetence	.72	2.25 (1.01)	1.90 (0.84)	6.12**
Vulnerability to Harm or Illness	.79	2.41 (1.20)	2.27 (1.01)	0.69
Enmeshment/Undeveloped Self	.66	2.38 (1.01)	2.21 (0.93)	1.36
Entitlement/Grandiosity	.65	2.20 (0.81)	2.38 (0.95)	1.83
Insufficient Self-Control/Self-Discipline	.72	2.61 (1.08)	2.52 (0.91)	0.32
Subjugation	.75	2.32 (0.99)	2.03 (0.87)	3.97*
Self-Sacrifice	.78	3.38 (1.16)	3.09 (0.89)	3.25
Emotional Inhibition	.82	2.66 (1.15)	2.33 (1.19)	3.52
Unrelenting Standards/Hypercriticalness	.74	2.50 (0.98)	2.73 (1.06)	2.25

Note. *p <= .05; **p <= .01

Table 3. *Hierarchical multiple regression analyses of the predictive value of maladaptive schemas for internalizing and externalizing problem behaviour in youth*

		F	*R*	*R²*	*t*	*β*
Internalizing						
Block 1		6.61***	.33	.11		
-	Age				-.09	-.01
-	Gender				4.06	.30***
-	SES				1.49	.11
Block 2		10.85***	.46	.21		
-	Weight status				4.60	.32***
Block 3						
-	Social Isolation/Alienation	21.91***	.63	.40	7.25	.45***
-	Vulnerability to Harm/Illness	21.77***	.67	.45	3.60	.24***
Externalizing						
Block 1		.84	.12	.02		
-	Age				-.60	-.05
-	Gender				.72	.06
-	SES				1.20	.09
Block 2		2.22	.23	.05		
-	Weight status				2.51	.19**
Block 3						
-	Entitlement	6.27***	.40	.16	4.62	.34***
-	Dependence/Incompetence	6.43***	.44	.19	2.50	.20**

Note. SES = Socio-economic status; **p <= .01; ***p <= .001

Chapter 6

Dysfunctional schemas and psychopathology in adolescence: On the utility of Young's schema theory in youth[1]

The present chapter reports on two studies that investigated the utility of Young's adult cognitive theory to understand cognitive vulnerability and its association with psychopathology in adolescents. Study 1 focused on the factorial validity and internal consistency of the Young Schema Questionnaire (YSQ) in youth. In Study 2, the dimensionality of Young's dysfunctional schemas and their (content-specific) association with varying forms of psychopathology in youth were investigated. In Study 1, 635 non-referred youngsters (12-18 years) participated. In Study 2, participants were112 non-referred and 104 referred adolescents (12-18 years). Altogether, the findings of the both studies were in line with the main assumptions of cognitive theory in general and Young's schema theory in particular. Hence, Young's schema theory might constitute a valuable framework to understand psychopathology in youth.

Introduction

During the past few decades, the cognitive framework has generated a vast body of empirical research on psychopathology (Clark, Beck, & Alford, 1999; J. M. G. Williams, Watts, MacLeod, & Mathews, 1997). One of cognitive theory's core assumptions is that negative basic beliefs about the self, the world and one's relationships with others, also denoted as maladaptive schemas, are at the bottom of development and maintenance of emotional disorders (J. S. Beck, 1995). Dysfunctional schemas are presumed to develop early in life through negative interactions with primary caregivers, and make people vulnerable to psychological problems when confronted with stress. Hence, the model is often referred to as a vulnerability-stress framework (Clark et al., 1999). Cognitive theory adopts a dimensional perspective on vulnerability: maladaptive schemas are supposed to be present in each person but to a larger extent in individuals with more severe psychological problems (Clark et al., 1999). Further, it is assumed that each type of emotional disturbance is related to a unique cognitive profile characterised by specific cognitive content (A. T. Beck, 1976). In depression, the predominant cognitive theme is assumed to be about personal and significant loss or deprivation (Clark et al., 1999). It is hypothesized that the primary beliefs in anxiety are about physical or psychological threat and the individual's appraisal of (in)capacity for coping with danger and compensating for his/her vulnerability (A. T. Beck, Emery, & Greenberg, 1985). In anger, the perception of a transgression to one's personal domain and the individual's appraisal of (in)capability to sustain, neutralize or repulse the assault are supposed to be central (A. T. Beck, 1976). Perceptions of personal assaults include restrictions or frustration of needs, which are interpreted as violation of rights.

Research on maladaptive schemas in younger populations has lagged far behind that of adult samples. Most cognitive vulnerability-stress models were

originally developed for adults and have subsequently been applied to the development of psychopathology in youth, without considering the possible need for revision (Gibb & Coles, 2005). However, before adolescent schemas and their potential association with psychopathology in youth can be studied, developmentally appropriate, reliable and valid measures of the hypothesized vulnerability factors are first and foremost needed. Subsequently, on a conceptual level, the tenability of the cognitive framework's theoretical assumptions in younger populations should be investigated. In practice however, psychometric and theoretical issues are not always strictly separable. For example, whereas the cognitive content-specificity *hypothesis* is part of the cognitive framework and therefore situated on a theoretical level, cognitive content-specificity *research* often translates in examining convergent and divergent correlations of cognitive vulnerability and psychopathology measures, which closely resembles psychometric validity research (R. Beck & Perkins, 2001). Hence, many studies within the cognitive framework can be interpreted from either a theoretical or a psychometric perspective.

Research on the cognitive model in adults has received a new impulse by Jeffrey Young's schematheory (Young et al., 2003). In line with Beck's original model (A. T. Beck, 1967; A. T. Beck, Rush, Shaw, & Emery, 1979), Young defines a maladaptive schema as 'a broad pervasive theme or pattern comprised of memories, emotions, cognitions and bodily sensations regarding oneself and one's relationships with others, developed during childhood or adolescence, elaborated throughout one's lifetime and dysfunctional to a significant degree' (Young et al., 2003). Based on clinical experience in adults with personality disorders, he distinguished 16 maladaptive schemas that are different as regards content and can be grouped within five schema domains, i.e., the Disconnection/Rejection domain, the Impaired Autonomy/Performance domain, the Impaired Limits domain, the Other-Directedness domain and the Overvigilance/Inihibition domain.

To assess these schemas and domains, Young developed a 205-item self report measure, the Young Schema Questionnaire (YSQ-LF: Young & Brown, 1990). Schmidt, Joiner, Young and Telch (1995) conducted an exploratory evaluation of the factor structure of the YSQ-LF in a student (n=1129) and a patient (n=187) sample. In general, both samples produced an oblique factor structure that closely resembled Young's theoretically proposed schema structure. However, one schema, 'Social Undesirability' (the belief that one is different from others and undesirable in terms of physical attractiveness, social skills, moral integrity, or personality), emerged in neither sample as a separate factor. Consequently, when later a shorter version of the Young Schema Questionnaire (YSQ-SF; 75 items) was developed, the Social Undesirability schema was no longer adopted. The YSQ-SF is designed to represent more pure factors, as the five items selected for each schema were those with the highest factor loadings in the study of Schmidt et al. (1995). One clear advantage of the short form, especially in younger populations, is that it is easier to administer. A brief description of the content of each schema and each schema domain is depicted in Table 1, together with an exemplary YSQ-item for each schema.

Several studies in adults focused on the psychometric properties of the long and the short versions of the YSQ, in the general population as well as in patient samples. Both measures show adequate internal consistency, test-retest reliability, discriminant and construct validity and further factor analyses on the YSQ-items generally confirm the proposed 15-schema structure (e.g.: Calvete, Estevez, de Arroyabe, & Ruiz, 2005; Hoffart et al., 2005; Lee, Taylor, & Dunn, 1999; Rijkeboer & van den Bergh, 2006; Rijkeboer, van den Bergh, & van den Bout, 2005; Schmidt et al., 1995; Waller, Shah, Ohanian, & Elliott, 2001; Welburn, Coristine, Dagg, Pontefract, & Jordan, 2002). Furthermore, Waller, Meyer and Ohanian (2001) demonstrated that the YSQ-LF and YSQ-SF have similar levels of internal consistency, reliability and discriminant validity and that the clinical utility of both measures is quite comparable.

Although the first order factor structure of the YSQ is generally acknowledged, there has been quite some debate on the schema *domain* structure Young theoretically hypothesized. Exploratory second order factor analyses on the YSQ in student (Calvete et al., 2005; Schmidt et al., 1995) and patient (Lee et al., 1999) samples respectively led to a solution with three and four instead of five second order factors. However, a close inspection of the factor loading pattern provided by Lee et al. (1999) for example shows how the majority of schemas load substantially (factor loadings larger then |.30|) on two or more second order factors. These cross-loadings are not surprising since schema subscales tend to intercorrelate highly. For example, in the Schmidt et al. (1995) study correlations between schemas varied between .21 and .73 (all $p > .001$). In the study by Calvete and colleagues (2005) all but four correlations between the 15 schemas were significant at the $p < .001$ – level.

Interpretation of factors in factor analysis always involves the balancing of psychometric and theoretical arguments. To label the three or four second order factors they established, Schmidt et al. (1995), Lee et al. (1999) and Calvete et al. (2005) started from Young's theoretical five domain taxonomy and interpreted some substantial factor loadings while ignoring others, retaining as few cross-loadings as possible. For example, Lee and colleagues (1999) labelled one second order factor Impaired Autonomy as all four schemas constituting Young's Impaired Autonomy/Performance domain (see Table 1) loaded significantly on this factor. However, each of these four schemas displayed a substantial cross-loading on at least one other second order factor. Moreover, five other schemas also loaded substantially on the so-called Impaired Autonomy factor. Actually, the value of such theory-driven interpretations of exploratory analyses should subsequently be tested with confirmatory techniques. This way, it can for example be examined whether the negation of so many cross-loadings does not harm the model psychometrically. This was done by Calvete and colleagues (2005) who confirmed the fit of their exploratory

three-factor model. The use of confirmatory factor analysis also yields the opportunity to balance several models against each other and determine which one most parsimoniously represents the YSQ higher order structure. This way, Hoffart and colleagues (2005) evidenced in a patient sample the fit of a four factor higher order structure, based on the exploratory results of Lee et al. (1999) and its superiority compared to a three factor model, based on the exploratory results of Schmidt et al. (1995) as well as to the five factor solution hypothesized by Young (2003). To the best of our knowledge, no other confirmatory second order factor analyses are available in the adult literature.

At first glance, Young's theory provides an excellent opportunity to test the cognitive content-specificity hypothesis. Hence, not surprisingly, many researchers have used Young's taxonomy in an attempt to characterize the content of cognitive vulnerability in adults with various forms of psychopathology, for instance personality disorders (e.g.: Jovev & Jackson, 2004; Petrocelli, Glaser, Calhoun, & Campbell, 2001), eating disorders (e.g.: Leung, Waller, & Thomas, 1999; Unoka, Tolgyes, & Czobor, 2007; Waller, Ohanian, Meyer, & Osman, 2000), alcohol and drug abuse (e.g.: Brotchie, Meyer, Copello, Kidney, & Waller, 2004), anxiety (e.g.: Pinto-Gouveia, Castilho, Galhardo, & Cunha, 2006) and depression (e.g.: Shah & Waller, 2000). In the latter type of studies, it was consistently demonstrated that those suffering from psychopathology display significantly higher schema scores as compared with 'healthy' controls, that schema scores can discriminate reliably between groups with different forms of psychopathology and/or that schema scores are associated with or predictive for psychological problems. These findings are in line with cognitive theory's assumptions on the dimensionality of the schema concept and on the positive association of maladaptive schemas and psychopathology.

However, there are major differences between studies with regards to the specific maladaptive schemas held by individuals sharing the same

psychological disorder (for an illustration of this lack of consistency in studies on depression and anxiety, see the overview by Calvete et al., 2005), which is in flat contradiction with the cognitive content-specificity hypothesis. Obviously, these inconsistencies may reflect methodological differences between studies (e.g., inclusion of referred versus non-referred sample, use of different instruments to assess psychopathology, age group under study, etc.). Besides however, it is noteworthy that in all these studies, schemas and not schema domains (or other established higher order factors) were used. Hence, all analyses were conducted with a large set (n=15) of (highly) correlating predictors, which seriously complicates the evaluation of the relative importance of each maladaptive schema. In our opinion, by using schema domains (or other higher order factors), the content-specificity hypothesis might be more parsimoniously and adequately addressed.

In conclusion, mounting evidence suggests the utility of Young's model in general and the YSQ in particular to conceptualize distorted thinking patterns in referred and non-referred adults with differing psychological problems. Nevertheless, some unresolved methodological issues run through the literature and prevent us from drawing firm conclusions on the validity of Young's domain taxonomy and the tenability of the cognitive content-specificity hypothesis within his framework. In our opinion, the use of confirmatory techniques to test and contrast second order models on the one hand and the inclusion of higher order factors when examining cognitive content-specificity on the other hand might create an opportunity to overcome this methodological impasse.

Despite a large amount of studies in adults, the incorporation of Young's cognitive theory in child and adolescent psychopathology research is still in its infancy. Nonetheless, as dysfunctional schemas are presumed to originate early in life and subsequently create vulnerability for psychological problems, cognitive diatheses must be, albeit in some developing form (Cole et al., 2008; J.

E. Turner & Cole, 1994), demonstrable from childhood onwards. The study of schemas in youth is of special relevance. First of all, a better understanding of maladaptive schemas that develop out of familial adversity in childhood and their subsequent association with specific forms of emotional and behavioural problems, yield insight in developmental trajectories of psychopathology. Secondly, Young has outlined specific treatment strategies to deal with dysfunctional schemas. Promising results of schema-focused therapy were found in a randomized control trial with borderline personality disorder patients (Giesen-Bloo et al., 2006). The treatment effect of schema-focused therapy for Axis-I disorders remains to be evaluated. However, as the central role of cognitive schemas in these disorders is generally acknowledged (cf. supra), the usefulness of schema-therapy could be assumed for Axis-I pathology also. Consequently, in case Young's theory stands the test in youth, his schema model might create the opportunity of developing early interventions for youngsters.

To date, five reports (including four separate samples) have described the use of Young's framework in adolescent populations. In a community sample of about 300 17 - 18 year old girls, the YSQ-SF was able to identify *specific* schemas linked to depressive but not eating disorder symptoms (Cooper, Rose, & Turner, 2005). When in this sample the top 10% and bottom 10% on Body Mass Index (BMI) were selected, a greater severity of dysfunctional schemas and an association of schemas on the one hand and low levels of maternal care and high levels of overprotection on the other hand were demonstrated in the overweight group (n=23) (H. M. Turner, Rose, & Cooper, 2005). Van Vlierberghe and Braet (2007) also demonstrated a greater severity of maladaptive schemas in referred obese youth (n=91) as compared with normal weight controls (n=91) and a general association of schemas with internalizing and externalizing problem behaviour. Moreover, the YSQ-SF schema scales appeared reliable in terms of internal consistency, with alphas ranging from .65 up to .86. Next, in a community sample of 173 boys and girls aged 12 to 15

years, Muris (2006) found correlations between dysfunctional schemas on the one hand and parental rearing practices, personality and psychological symptoms on the other hand. Again, the YSQ-SF schema scales appeared internally consistent (most Cronbach alphas .70 or higher). Finally, in a sample of both referred (n=37) and non-referred (n=39) depressed youth (aged 13-19), Lumley and Harkness (2007) found evidence for a cognitive content specificity model in which cognitions related to danger (Vulnerability to Harm/Illness) preferentially mediated the association of childhood maltreatment and anxiety symptoms and schemas related to loss or worthlessness (Emotional Deprivation, Self-sacrifice, Social Isolation/Alienation) preferentially mediated the association of childhood maltreatment and depressive symptoms. In sum, the internal consistency levels of the YSQ-SF in youth, and the theoretically meaningful correlates and discriminative power of the maladaptive schemas outlined by Young, seem promising. Nonetheless, more research in youngsters is needed. Therefore, the present article reports on two studies that further investigated the utility of Young's cognitive framework in youth.

Aims of the present research

Study 1 focused on the internal consistency and the factorial validity of the YSQ-SF in youth. Research with the YSQ in adolescents has predominantly been carried out in relatively small samples. As a result, an adequate test of the YSQ-SF factor structure in youth is lacking. In the study by Muris (2006), an exploratory second order factor analysis on the schema subscales yielded support for a three-factor structure. However, as in adults, most schemas displayed substantial cross-loadings on more than one higher order factor. Interestingly, Muris (2006) postulated on the basis of these results that during adolescence, dysfunctional schemas may still be in the process of elaboration and are therefore less differentiated than in adulthood. This suggests the potential presence of one general cognitive vulnerability factor. Such instability of

distorted thinking patterns should also be reflected in the first order factor structure of the YSQ in youngsters. Unfortunately, a first order factor analysis on the YSQ-items was not performed because of the small sample size. Alternatively however, Muris (2006) also pointed at the resemblance of these results to those of studies in adults. Likewise, he theoretically labelled the established higher order factors in terms of Young's original domain taxonomy, interpreting some substantial factor loadings while ignoring others, retaining as few cross-loadings as possible. This way, one higher order factor was interpreted as a combination of the Impaired Autonomy/Performance, the Other-Directedness and the Overvigilance/Inhibition domain. Another higher order factor was labelled Disconnection/Rejection and a final higher order factor was interpreted as the Impaired Limits domain. Unfortunately, the fit of this second order factor model was not tested confirmatory.

In sum, Study 1 firstly investigated in a sufficiently large sample of non-referred adolescents whether Young's 15-schema structure can be replicated in youth, using confirmatory factor analysis. Moreover, to examine Muris' (2006) hypothesis that schemas in adolescents are less differentiated than those in adults, the 15-schema model was contrasted with a model in which all YSQ-items loaded on one general cognitive vulnerability factor. Secondly, the second order factor structure of the YSQ was examined, again using confirmatory analyses. As in the end, authors apparently always return to Young's domain taxonomy to interpret higher order models, we started with examining the fit of Young's five-domain model. This model was contrasted with the three-factor models outlined by Calvete and colleagues (2005) and Muris (2006) and the four-factor model outlined by Hoffart and colleagues (2005). Further, Muris' (2006) hypothesis of one general cognitive vulnerability factor was also investigated on a second order factor level.

In **Study 2**, the tenability in youngsters of some theoretical assumptions of the cognitive framework in general and Young's theory in particular, were

tested. First, the dimensionality of the schema concept was investigated by examining whether Young's maladaptive schemas are present to a larger extent in referred than in non-referred adolescents. In this regard, one could argue that referral status tells us nothing about the presence or absence of mental disorders. However, in clinical practice it does not matter whether or not a child exhibits subtreshold symptomatology or fulfils all criteria for a psychiatric diagnosis: referred youngsters show suffering and maladaptive functioning is assumed. Next, the hypothesis that maladaptive schemas have explanatory value for understanding psychopathology in adolescence was studied. Finally, the tenability of the cognitive content-specificity hypothesis was investigated. From the theoretical viewpoint on content-specificity outlined at the end of the first paragraph (A. T. Beck, 1976; A. T. Beck et al., 1985; Clark et al., 1999) as well as on the basis of the empirical studies on content specificity within Young's framework mentioned above (e.g.: Calvete et al., 2005; Pinto-Gouveia et al., 2006; Shah & Waller, 2000), we assumed that predominantly the Disconnection/Rejection domain would be associated with depression, the Impaired Autonomy/Performance domain would be associated with anxiety and the Impaired Limits domain would be associated with disruptive behaviour.

Study 1: Factor structure and internal consistency of the YSQ-SF in youth

Methods

Participants

The sample of Study 1 included 635 school aged non-referred adolescents (352 girls; 283 boys) with a mean age of 14.87 years (SD = 1.65; range 12-18). According to Hollingshead four factor index of socioeconomic status (Hollingshead, 1975), 1.10% of the youngsters' families were in upper, 15.91% in upper-middle, 59.06% in middle, 19.53% in lower middle and 3.31% in lower social class. In seven cases, data on SES were missing.

Measures

The *Young Schema Questionnaire* (YSQ: Young & Brown, 1990) *Short Version* is a 75-item self-report questionnaire that assesses 15 maladaptive schemas and five schema domains as outlined by Young (Young et al., 2003). Each item is phrased as a negative belief regarding self and one's relationships with others, 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-LF (Sterk & Rijkeboer, 1997) demonstrates good psychometric properties in referred and non-referred adult populations (Rijkeboer & van den Bergh, 2006; Rijkeboer et al., 2005). 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 was backtranslated and sent to the original author for approval.

Procedure

The institutional review board of Ghent University reviewed and approved the protocol of this study. Youngsters between 12 and 18 years of age were eligible. Two recruitment methods were used. First, four secondary schools were contacted and agreed to take part. School sampling was based on grade (from 1 to 7), type of curriculum (general, technical and vocational education) and school type (public and catholic). One father refused the participation of his daughter. In total, 220 boys and 259 girls were questioned via schools. Second, third-year clinical psychology students were instructed to recruit volunteers between the age of 12 and 18. This way, 70 boys and 110 girls were questioned at home. After explication of the objectives and the procedure of the study, informed consent was obtained from adolescents and their parents. Overall, 3.64% (n=24) of the youngsters were excluded due to an excess of missing

YSQ-data (>5% missing YSQ-items).

Data analysis

   We tested the first and the second order factorial validity of the YSQ in youth by means of confirmatory factor analyses (CFA's) performed with MPlus (Muthén & Muthén, 2007). Although overall only 0.28% of YSQ-items were missing, listwise deletion of participants would have reduced the total sample size to 539 subjects. Therefore, analyses were done using the Full Information Maximum Likelihood (FIML) method to deal with the missing values (for a discussion on this matter, see: Brown, 2006).

   Several types of indices for determining overall model fit were used. First of all, the chi-square goodness-of-fit statistic divided by its degrees of freedom is reported. Ratios of 2:1 to 5:1 indicate acceptable fit, but values less than 3 are considered favourable (Kline, 1998). The comparative fit index (CFI) and the Tucker-Lewis index (TLI) are incremental fit indices, with values greater than .90 and .95 indicating adequate and good model fit (Hu & Bentler, 1999). The root-mean-square error of approximation (RMSEA) is a non-centrality based index, with a RMSEA up to .08 and .06 representing respectively acceptable and good model fit (Browne & Cudeck, 1992). Finally, the standardized root-mean-square residual (SRMR) is a standardized summary of the average covariance residuals, with a cut-off value close to .08 indicating a relatively good fit to the model (Hu & Bentler, 1999). Because inspection of the data revealed that the assumption of (multivariate) normality did not hold, the distribution of the test statistics to evaluate model fit, might be distorted. Therefore, a robust estimator was used to correct for non-normality.

   In all CFA's, oblique rotation was applied, assuming that schemas as well as higher order factors are not totally uncorrelated. Further, the following specifications were made: (1) each item of the YSQ was allowed to load freely on its theoretically hypothesized schema, but was not allowed to load on other schemas, (2) in the second order models, schemas were only allowed to load on

the hypothesized higher order factor(s) with zero loadings on the other higher order factors, (3) schemas were free to correlate, (4) in the second order models, higher order factors were free to correlate, and (5) the measurement error variances between the observed variables were not allowed to correlate.

Results

First order confirmatory factor analyses

The results of the goodness of fit indices for the first order CFA's (as shown in Table 2), suggest that the fit of Young's theoretically hypothesized 15 schema structure to the data is acceptable and should be preferred above a model including only one general cognitive vulnerability factor. Only the CFI and the TLI-values for the 15-factor model were just below the threshold of .90. Schema scores were computed in accordance with Young's theoretical 15-schema model. Table 3 depicts Cronbach alphas together with means and standard deviations of schema scores for boys and girls. As can be seen, all subscales were internally consistent, with alphas ranging from .64 for the Enmeshment schema up to .85 for the Abandonment/Instability schema. Intercorrelations between observed schema scores varied between .18 and .62 (all $p < .001$).

Second order confirmatory factor analyses

The goodness of fit indices for the second order CFA's (also shown in Table 2), suggest that all tested models fit the data well. Again, only the CFI and the TLI-values were just below the threshold of .90 each time. Given that the present analyses yielded no psychometric arguments to assume that one of these models is preferable above the other, we choose to compute the five domain scores in accordance with Young's theoretical model. Means, standard deviations and Cronbach alphas of the domain scores for boys and girls are also depicted in Table 3. As can be seen, all schema domain subscales were internally consistent, with alphas ranging from .77 for the Other-Directedness schema domain up to .92 for the Disconnection/Rejection schema domain.

Intercorrelations between observed schema domain scores varied between .47 and .68 (all $p < .001$).

Study 2: Tenability of Young's cognitive theory in youth

Methods

Participants

The sample of Study 2 consisted of 104 referred (41 girls; 63 boys) and 112 non-referred (38 girls; 74 boys) adolescents. In the referred sample, the youngsters' mean age was 14.60 years ($SD = 1.60$; range 12-18) and according to Hollingshead index of SES (Hollingshead, 1975), 1.92% of the adolescents' families were in upper, 15.38% in upper-middle, 43.27% in middle, 25.96% in lower middle and 1.92% in lower social class. Twelve referred adolescents permanently lived in an institution. In the non-referred sample, the youngsters' mean age was 15.50 years ($SD = 1.70$; range 12-18) and 14.41% of the adolescents' families were in upper-middle, 64.86% in middle, 18.92% in lower middle and 1.80% in lower social class. For one non-referred adolescent, no information on SES was obtained. The referred and the non-referred group did not differ from each other in terms of gender distribution, $\chi^2(1) = 0.70$, $p = .40$, or in terms of SES, $F(1,201) = 0.03$, $p = .87$. However, group differences were found for age, $F(1,214) = 16.06$, $p < .001$. The non-referred group was significantly older than the referred group.

Instruments

The *Youth Self Report* and the *Child Behavior Checklist* (YSR and CBCL: Achenbach & Rescorla, 2001) are valid and reliable questionnaires assessing emotional and behavioural problem areas in youth as reported by the adolescent and one of the parents respectively. For both the CBCL and the YSR, a global internalizing and externalizing problem behaviour score is obtained. Moreover, Achenbach and Rescorla (2001) constructed scales for scoring the

CBCL and the YSR in terms of items that experienced psychiatrists and psychologists judged to be very consistent with DSM-IV diagnostic categories. For the purpose of the present study, the DSM-oriented scales 'affective problems', anxiety problems', 'oppositional defiant problems' and 'conduct problems' were used[2]. Obviously, a particular score on a DSM-oriented scale is not directly equivalent to a DSM diagnosis: high scores on DSM-oriented scales suggest diagnoses that should be considered. However, in contrast with the categorical approach of using structured clinical interviews to asses the presence or absence of a psychiatric diagnosis, DSM-oriented scales provide the possibility of dimensional assessment of DSM pathology, which enables more advanced forms of statistical testing. On the basis of normative data from a large non-referred sample of American children who had not received any psychological or psychiatric help in the preceding 12 months (Achenbach & Rescorla, 2001), T-scores were assigned to raw scale scores to enable comparison of children with peers.

The *Structured Clinical Interview for DSM-IV - Childhood version* (KID-SCID: Hien et al., 1994) is based on the SCID for adults (Spitzer, Williams, & Gibbon, 1986), a widely used diagnostic interview that has acceptable reliability and validity (Spitzer, Williams, Gibbon, & First, 1992; J. B. W. Williams et al., 1992). Similar to the adult version, the KID-SCID is an interviewer-based semi-structured instrument designed to generate childhood DSM-IV diagnoses for clinical research studies. The interview was translated in Dutch by Dreessen, Stroux and Weckx (1998). In the current study, the following modules were administered in an interview format with the

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[2]   The DSM-oriented scales were used to investigate the cognitive content-specificity hypothesis. Particularly the subscales 'affective problems', anxiety problems' oppositional defiant problems' and 'conduct problems' were selected, because for these four forms of psychopathology we were able to formulate literature-based (A. T. Beck, 1976; A. T. Beck et al., 1985; Clark et al., 1999) concrete hypotheses on content specificity.

adolescent: disruptive behaviour disorders, mood disorders, anxiety disorders and adjustment disorders. Psychometric studies are still ongoing, but preliminary results of a study by Matzner, Silva, Silvan, Chowdhury and Nastasi (1997) showed fair to excellent test-retest reliability for the disruptive behaviour disorders (between .63 and .84) and various anxiety disorders (between .44 and 1.0). Other studies indicated excellent interrater reliability and convergent validity for the various modules (Matzner, 1994; Smith, Huber, & Hall, 2005; Timbremont, Braet, & Dreessen, 2004).

For a description of the adolescent *Young Schema Questionnaire – Short Version*: see Study 1.

Procedure

The institutional review board of Ghent University reviewed and approved the protocol of this study. Youngsters between 12 and 18 years of age were eligible. After explication of the objectives and the procedure of the study, informed consent was obtained from adolescents and their parents. Adolescent questionnaires (YSR and YSQ) and interviews (KID-SCID) were administered randomly by trained clinical psychology students or trained psychologists. The CBCL was sent to all parents.

Referred youngsters were recruited via two outpatient (eligible participants: n=30 and n=29 respectively) and four inpatient centres (eligible participants: n=12, n=47, n=9 and n=19 respectively) for assessment and treatment of adolescents with emotional and behavioural problems. Across institutions, 146 referred adolescents were eligible for this study, 84.93% (n=124) agreed to take part and 75.34% (n=110) effectively participated. Participation was rewarded with two movie theatre vouchers. Six youngsters (5.45%) were excluded due to an excess of missing YSQ-data (>5% YSQ-items missing). In the referred group, 41.35% of the parents did not return the CBCL, a problem frequently encountered in residential settings. In these cases, a close

attendant of the child at the institution was asked to fill out the CBCL. This way, the inclusion of a second informant for the measurement of psychopathology was finally realised in 84.62% of the referred youngsters. Further, 3.85% of the YSR's was not valid and two referred youngsters could not be interviewed for organisational reasons.

To compose the non-referred sample, third-year clinical psychology students were instructed to recruit two volunteers between the age of 12 and 18 to participate in the present study. Students were asked to include only youngsters following technical and/or vocational education and at least one of both volunteers had to be a boy. This was done to match the referred and the non-referred sample as closely as possible with respect to SES and gender respectively. In total, 79 boys and 39 girls were questioned at home. None of the adolescents from study two was included in study one. Youngsters were asked whether they received any psychological or psychiatric help at the moment of the study. This was the case for two participants. For one adolescent no information on referral status was obtained. These three youngsters were excluded from further analyses. Another three youngsters (2.54%) were removed due to an excess of missing YSQ-data (>5% YSQ-items missing). Finally, two CBCL's (1.79%) were not returned.

Data analysis

CBCL and YSR data were combined to multi-informant scores by extracting a common factor score from each pair of ratings. In case only ratings of one informant were available, the score of the other informant substituted the missing value for the construction of the composite psychopathology scores. This way, six dimensional composite psychopathology measures were obtained: internalizing problem behaviour, externalizing problem behaviour, affective disorder symptoms, anxiety disorder symptoms, oppositional defiant disorder symptoms and conduct disorder symptoms.

Further, three categorical psychopathology measures were constructed on the basis of the clinical interview data: (1) The presence (value 1) or absence (value 0) of at least one mood disorder diagnosis (that is: the adolescent fulfilled all criteria for depressive disorder, (hypo)manic episode, dysthymic disorder and/or depressive disorder not otherwise specified; n=20); (2) The presence (value 1) or absence (value 0) of at least one anxiety disorder diagnosis (that is: the adolescent fulfilled all criteria for separation anxiety disorder, social phobia, specific phobia, obsessive compulsive disorder, generalized anxiety disorder, panic disorder, agoraphobia and/or anxiety disorder not otherwise specified; n=26); (3) The presence (value 1) or absence (value 0) of at least one disruptive behaviour disorder diagnosis (that is: the adolescent fulfilled all criteria for an oppositional defiant disorder, a conduct disorder or a conduct disorder not otherwise specified[3]; n=36).

Schema and schema domain scores of the non-referred and the referred sample were compared by means of two Multivariate Analyses of Covariance (MANCOVA's) with referral status as a factor, age as a covariate and respectively the 15 schema and the five domain scores as dependent variables. Next, the association of schemas and schema domains on the one hand with internalizing and externalizing problem behaviour on the other hand was investigated by computing Pearson's correlation coefficients in the whole sample. Then, the explanatory value of maladaptive schemas and schema domains for internalizing and externalizing symptomatology in youth was explored by means of four multiple regression analyses (again in the whole sample), with respectively the schemas and the schema domains as the

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[3]   The categorical psychopathology measures were used to examine the cognitive content-specificity hypothesis. One could argue that Attentional Deficit Hyperactivity Disorder (ADHD) should have been included in the disruptive behaviour disorder category also. However, as noted earlier in the description of the DSM-oriented scales, we only included those forms of psychopathology for which we could formulate concrete hypotheses on the basis of Beck's assumptions on content-specificity in sadness, anxiety and anger.

independent variables and the internalizing and externalizing symptom score as the dependent variables.

Finally, the cognitive content specificity hypothesis was addressed in two sets of

analyses. As substantiated throughout the introduction and on the basis of the results of Study 1, we decided to conduct these analyses with schema *domain* scores and not with individual schema scores.

Firstly, with the composite DSM-oriented scales as the dependent variables, four multiple linear regressions were conducted, each time with the five schema domains as the independent variables. For the purpose of this research question, the *unique* contribution of a schema domain in explaining the variance in adolescent symptomatology was of primary interest. However, based on the results of Study 1, we expected schema domains to correlate substantially, which complicates the assessment of the relative importance of each independent variable in regression models. In this regard, Tabachnick and Fidell (2001) recommend the consideration of both the full and the unique relationships between the predictors and the dependent variable. The *full association* is expressed in the zero-order correlation between the independent and the dependent variable. In multiple linear regression, an estimate of the *unique association* is provided by the squared semi-partial correlation (sr^2), which expresses the proportion of variation in the dependent variable that is uniquely explained by the respective independent variable. The significance test for the standardised regression coefficient (β) simultaneously evaluates the significance of the semi-partial correlation of an independent variable.

Secondly, with the categorical KID-SCID diagnoses as dependent variables, three two-group discriminant analyses were conducted, each time with the schema domain scores as the independent variables. The discriminant loadings parallel the abovementioned zero-order correlations and hence represent the *full* association between the independent variables and the dependent

variable. Generally, independent variables with higher loadings are considered more important to discriminate among groups. We considered discriminant loadings with an absolute value equal to or above .30 as substantial. The standardized canonical discriminant function coefficients (comparable to the β-values in linear regression) tell us something about the *unique* contribution of a schema domain in predicting group membership. Unfortunately, discriminant analysis provides neither a significance test for these standardized coefficients nor an estimate of the proportion of variance uniquely explained by the respective independent variable (like sr^2 in regression). All analyses were done in SPSS 15.0.

Results

Descriptive statistics: mean psychopathology scores and mental disorder diagnoses in the referred and the non-referred sample

Table 4 displays Cronbach alphas, mean T-scores and standard deviations on CBCL and YSR subscales as well as *F*-values for the comparison of non-referred and referred youth. As can be seen, referred youngsters scored significantly higher than non-referred youngsters for all psychological symptom subscales. After calculation of the composite psychopathology scores, significant differences remained for internalizing, $F(1,214) = 86.35$, $p < .001$, and externalizing symptoms, $F(1,214) = 64.70$, $p < .001$, as well as for affective, $F(1,214) = 98.94$, $p < .001$, anxiety, $F(1,214) = 45.35$, $p < .001$, oppositional defiant, $F(1,214) = 39.41$, $p < .001$, and conduct disorder, $F(1,214) = 44.39$, $p < .001$.

For the purpose of the first research question, we checked whether referred youngsters with a diagnosis differed from referred youngsters without a diagnosis regarding the dimensional composite psychopathology measures. Table 5 provides an overview of the mental disorder diagnoses obtained with the clinical interview. In the non-referred group, six youngsters (5.36%) received

one diagnosis. In the referred sample, 69 youngsters (67.65%) obtained at least one mental disorder diagnosis: there were 40 adolescents (39.22%) with one, 18 (17.65%) with two, seven (6.86%) with three, and four (3.92%) with four diagnoses. An overall difference between non-referred youngsters, referred youngsters without a diagnosis and referred youngsters with at least one diagnosis was found for internalizing, $F(2,211) = 43.99$, $p < .001$, and externalizing, $F(2,211) = 33.16$, $p < .001$, problem behaviour as well as for the affective, $F(2,211) = 48.91$, $p < .001$, anxiety, $F(2,211) = 24.20$, $p < .001$, oppositional defiant, $F(2,211) = 19.77$, $p < .001$ and conduct disorder, $F(2,211) = 22.85$, $p < .001$, scales. Post-hoc analyses however revealed that each of these effects was attributable to differences between the non-referred group and the referred group with a diagnosis on the one hand, all $p < .001$, and between the non-referred group and the referred group without a diagnosis on the other hand, all $p < .001$. Referred youngsters without a diagnosis did not differ significantly from referred youngsters with a diagnosis for any of these psychopathology scales, all $p > .05$. The latter findings indicate that is reasonable to consider referred youngsters as one homogenous group of adolescents with respect to the presence of psychological symptomatology.

Dimensionality of the schema concept: mean differences in schema and schema domain scores between non-referred and referred youth

Overall, the first MANCOVA (see Table 6) revealed that the non-referred group differed from the referred group on the YSQ *schemas*, $F(15,198) = 1.86$, $p < .05$. Significant differences were found for 10 out of 15 schemas. The referred group scored significantly higher for the schemas Emotional Deprivation, $F(1,212) = 15.52$, $p < .001$, Abandonment/Instability, $F(1,212) = 12.06$, $p = .001$, Mistrust/Abuse, $F(1,212) = 8.43$, $p < .01$, Social Isolation/Alienation, $F(1,212) = 14.28$, $p < .001$, Defectiveness/Shame, $F(1,212) = 10.09$, $p < .01$, Failure to Achieve, $F(1, 215) = 7.34$, $p < .01$, Vulnerability to Harm/Illness, $F(1,212) = 6.99$, $p < .01$, Enmeshment/Undeveloped Self, $F(1,212)$

= 4.03, p = .05, Subjugation, $F(1,212)$ = 6.61, p = .01, and Self-Sacrifice, $F(1,212)$ = 4.21, p < .05. No differences emerged for the schemas Dependence/Incompetence, Entitlement/Grandiosity, Insufficient Self-Control/Self-Discipline, Emotional Inhibition and Unrelenting Standards/Hypercriticalness.

Further, the second MANCOVA (see also Table 6) revealed that the non-referred group differed from the referred youngsters on the YSQ *schema domains*, $F(5,209)$ = 4.09, p = .001. Significant differences were found for three out of five schema domains. The referred group scored significantly higher for the schema domains Disconnection and Rejection, $F(1,213)$ = 16.99, p < .001, Impaired Autonomy and Performance, $F(1,213)$ = 6.73, p = .01, and Other Directedness, $F(1,213)$ = 7.25, p < .01. No differences emerged for the schema domains Impaired Limits and Overvigilance/Inhibition.

In Table 6, Cronbach alphas, means and standard deviations of schema and schema domain scores for boys and girls in the referred and the non-referred group are reported. As can be seen, alphas ranged from .63 up to .92 in the non-referred group and from .67 up to .95 in the referred group. Alphas tended to be slightly higher in the referred group but in both groups an acceptable level of internal consistency was reached.

Association of cognitive vulnerability and internalizing and externalizing problem behaviour

Zero-order correlations between schemas and schema domains on the one hand and the composite internalizing symptom score on the other hand ranged between .22 and .49, all p <= .001. Except for Self-Sacrifice, r = .12, p = .08, and Unrelenting Standards/Hypercriticalness, r = .10, p = .14, all schemas and schema domains correlated significantly with externalizing symptoms. Significant zero-order correlations of schemas and schema domains with externalizing problems ranged between .17 and .34, all p <= .01. Regression analyses indicated that all maladaptive schemas together explained 29.81% of

the variance in internalizing problem behaviour and 21.34% of the variance in externalizing problem behaviour. Schema domains accounted for 26.42% of the variance in internalizing symptoms and 16.81% of the variance in externalizing symptoms.

In the build-up to our research questions on content-specificity, we tested for each schema domain whether the zero-order correlations of maladaptive schemas on the one hand and internalizing symptoms on the other hand were stronger than those between dysfunctional schemas and externalizing symptoms or vice versa. T-tests for examining differences between two dependent correlations revealed that the schema domains Disconnection/Rejection, $t(213) = 2.76$, $p < .01$, Impaired Autonomy/Performance, $t(213) = 3.47$, $p < .001$, Other-Directedness, $t(213) = 2.66$, $p < .01$, and Overvigilance/Inhibition, $t(213) = 3.09$, $p < .01$, were more strongly associated with internalizing than with externalizing problem behaviour. For the Impaired Limits domain, no such difference was established, $t(213) = -1.03$, $p = .30$.

Finally, we also calculated partial correlations to investigate the unique associations of schemas and schema domains with internalizing and externalizing symptoms respectively. As can be seen in Table 7, when externalizing symptoms were partialled out, *all but* the schemas constituting the Impaired Limits domain, remained significantly associated with internalizing symptoms. When internalizing problem behaviour was partialled out, *only* the schemas constituting the Impaired Limits domain, remained significantly associated with externalizing problem behaviour.

Cognitive content-specificity: Analyses with continuous psychopathology measures

Correlations between schema domains varied between .47 and .83 (all *p* < .001). Moreover, zero-order correlations between schema domains on the one hand and depressive, anxiety, oppositional defiant and conduct disorder

symptoms on the other hand ranged from .10 up to .46. All these correlations were significant, $p < .05$, except for the correlation between the Overvigilance/Inhibition domain and oppositional defiant disorder symptoms, $r = .10$, $p = .13$.

The first regression analysis indicated that all schema domains together accounted for 22.75% of the variance in depressive symptoms, which is a significant contribution, $F(5,210) = 12.36$, $p < .001$. In comparison with the other schema domains, the Disconnection and Rejection domain exhibited the highest zero-order correlation with depressive symptoms, $r = .46$, $p < .001$, and showed the largest unique contribution, $sr^2 = 2.34$. Only the Disconnection/Rejection domain was a significant unique predictor, $\beta = .30$, $p = .01$. The five schema domains in combination contributed 18.88% in shared variability.

The second regression analysis indicated that all schema domains together accounted for 25.00% of the variance in anxiety symptoms, which is a significant contribution, $F(5,210) = 13.99$, $p < .001$. In comparison with the other schema domains, the Disconnection/Rejection domain exhibited the highest zero-order correlation with anxiety symptoms, $r = .46$, $p < .001$, However, this domain showed only a small unique contribution, $sr^2 = 0.90$. The Impaired Autonomy/Performance domain showed the second highest zero-order correlation, $r = .45$, $p < .001$, combined with the largest unique contribution, $sr^2 = 1.59$. The Impaired Limits domain showed the lowest albeit significant zero-order correlation, $r = .18$, $p < .01$, combined with a relatively large unique *negative* contribution, $sr^2 = 1.42$. Both the Impaired Autonomy/Performance, $\beta = .24$, $p < .05$, and the Impaired Limits domain, $\beta = -.15$, $p = .05$, were significant predictors. The five schema domains in combination contributed 19.73% in shared variability.

The third regression analysis indicated that all schema domains together accounted for 9.12% of the variance in oppositional defiant disorder symptoms,

which is a significant contribution, $F(5,210) = 4.22$, $p = .001$. In comparison with the other schema domains, the Disconnection/Rejection and the Impaired Limits domain exhibited the highest zero-order correlation with oppositional defiant disorder symptoms, both $r = .24$, $p < .001$. The Impaired Limits domain showed the largest, $sr^2 = 2.86$, and the Disconnection/Rejection domain the second largest, $sr^2 = 1.82$, unique contribution. Both the Disconnection/Rejection, $\beta = .26$, $p < .05$, and the Impaired Limits domain, $\beta = .22$, $p = .01$, appeared significant predictors. The five schema domains in combination contributed 3.09% in shared variability.

The fourth regression analysis indicated that all schema domains together accounted for 10.18% of the variance in conduct disorder symptoms, which is a significant contribution, $F(5,210) = 4.75$, $p < .001$. In comparison with the other schema domains, the Impaired Limits domain exhibited the highest zero-order correlation with conduct disorder symptoms, $r = .27$, $p < .001$, and showed the largest unique contribution, $sr^2 = 2.56$. Only the Impaired Limits domain appeared a significant predictor, $\beta = .21$, $p < .05$. The five schema domains in combination contributed 6.09% in shared variability.

Cognitive content specificity: Analyses with categorical psychopathology measures

With respect to discriminating children with and without mood disorders, a discriminant function with an eigenvalue of .14, $\chi^2(5) = 27.24$, $p < .001$, was obtained. The discriminant loading matrix suggests that all schema domains are substantial predictors for distinguishing between youngsters with and without depression. The highest loading was found for the Disconnection/Rejection domain. Inspection of the canonical discriminant function coefficients revealed that Disconnection/Rejection is the main schema domain that contributes uniquely to the differentiation of both groups. Furthermore, the Impaired Autonomy/Performance showed a clear unique *negative* contribution.

Concerning anxiety disorders, a significant discriminant function with an eigenvalue of .09, $\chi^2(5) = 18.35$, $p < .01$, was obtained. On the basis of the discriminant loadings, all but the Impaired Limits domain appeared substantial predictors for distinguishing between youngsters with and without anxiety disorders. The highest loading was found for the Impaired Autonomy/Performance domain. Inspection of the canonical discriminant function coefficients showed that Impaired Autonomy/Performance is the main schema domain that contributes uniquely to the differentiation of both groups, followed by a clear unique *negative* contribution of the Impaired Limits domain.

Finally, for those children with and without behaviour disorders, a significant discriminant function with an eigenvalue of .06, $\chi^2(5) = 11.34$, $p = .05$, was found. All schema domains showed substantial discriminant loadings, the highest loading was found for the Disconnection/Rejection domain. Inspection of the discriminant function coefficients showed that Disconnection/Rejection is the main schema domain that contributes uniquely to group differentiation, followed by a clear unique contribution of the Impaired Limits domain.

Discussion

The overall aim of the present article was to investigate the utility of Young's cognitive framework to understand cognitive vulnerability and its association with psychopathology in youth. Whereas Study 1 mainly focused on the structural properties of the YSQ in adolescents, Study 2 dealt with the tenability of three of cognitive theory's main hypotheses in youth.

Confirmatory factor analyses demonstrated that Young's theoretically hypothesized first order model with 15 schemas has adequate fit in youth and should be favoured over a model including only one general cognitive vulnerability factor. Also, the 15 schema subscales appeared reliable in terms of internal consistency. These results largely parallel findings in adults and confirm

the reliability and the first order structural validity of the YSQ in younger populations. However, like in adults, schema subscales intercorrelated. As outlined in the introduction, this leads to high cross-loadings in exploratory second order factor analyses of the YSQ, which hampers the theoretic labeling and hence the usefulness of the established higher order factors. Therefore, we contrasted the adequacy of several second order models without cross-loadings, as was done earlier in adults by Hoffart and colleagues (2005) using confirmatory techniques. Analyses indicated that *all* tested second order models fit the data well.

Should the high correlation of schemas, the adequate fit of all tested models and the high correlation of schema domains be a reason to reject the idea of a higher order taxonomy and consider cognitive vulnerability as measured with the YSQ on the second order level as a one-dimensional construct? In our opinion, a balanced answer is in order here. On the basis of the present study results one can plead for both, depending on what one intends to. As outlined in the introduction, the interpretation of factors involves balancing psychometric and theoretical arguments. From a psychometric point of view, one should not bury one's head in the sand: who strives for thrift will argue that there are few well-reasoned arguments for considering more than one higher order factor. However, as illustrated in our analyses on content-specificity, the distinction between several second order factors yields a great opportunity to address theoretically interesting research questions. The use of Young's hypothesized five domain structure seems most appealing as one cannot escape the impression that in earlier studies (Calvete et al., 2005; Hoffart et al., 2005; Lee et al., 1999; Muris, 2006; Schmidt et al., 1995) one always returns to Young's domain taxonomy for the interpretation of the established second order factor structures. This theoretical choice is not psychometrically 'wrong': Young's model of five domains showed adequate fit. In this regard, it should however be noted that, although the number of predictors is reduced from 15 to five, the problems

associated with unraveling the unique contribution of intercorrelating predictors at least partly remain. As illustrated in our regression analyses on content-specificity (Study 2), the largest amount of explained variance in psychological symptoms is shared and not unique variability.

The dimensionality of the schema concept and the hypothesis that youngsters endorsing higher levels of symptomatology are situated more on the right side of the schema continuum, were confirmed. Generally, referred youngsters displayed higher levels of dysfunctional schemas as compared with non-referred youngsters and cognitive vulnerability was associated with internalizing as well as externalizing problem behaviour. Overall, the association of Young's schemas with internalizing symptoms seems stronger than the association with externalizing problem behaviour. The association of cognitive vulnerability and psychopathology in youth was further supported by the results of the regression and discriminant analyses that were conducted in the context of the cognitive content specificity hypothesis. For each psychopathology type, the schema domains explained a significant amount of the variance in symptoms and disorders.

Generally, Study 2 supported our hypotheses on cognitive content-specificity, on a symptom level as well as on a categorical level. Mood symptoms in youngsters were predicted straightforward from the Disconnection/Rejection schema domain. Apparently, in adolescents with depressive symptomatology, the dominant expectation is that one's needs for security, safety, stability, empathy, acceptance and respect will not be met in a predictable way. These results were confirmed when depression was assessed categorically. However, in contrast with our main hypotheses, also the Impaired Autonomy/Performance domain showed a clear albeit *negative* unique contribution to the discrimination of youngsters with and without mood disorder diagnoses. To shed light on this unexpected finding, we post-hoc conducted another discriminant analysis, with the four individual schemas constituting the

Impaired Autonomy/Performance domain as the independent variables. The results indicated that only the Dependence/Incompetence schema showed a clear negative unique contribution to distinguish both groups. In this regard, it could be hypothesized that depressed youngsters do *not* hold the belief that they are unable to cope in everyday life without the help of others, precisely because they expect that others will not fulfill their need for (emotional) support.

As hypothesized, adolescents with anxiety symptoms and disorders are predominantly characterized by beliefs about danger and vulnerability and by ideas about themselves that interfere with their perceived ability to separate from and function independently of significant others, to survive and to perform successfully. Furthermore, these cognitions appear to be combined with a great *dis*belief in one's superiority to other people and with the idea that one is clearly able to exert sufficient self-control and self-discipline for long-term goal orientation and inhibition of emotion and impulses.

The dimensional and categorical assessment of disruptive behaviour in the present Study 2 were not totally comparable. Prompted by the test construction of the CBCL/YSR on the one hand and the KID-SCID on the other hand, separate linear regression analyses were conducted for oppositional defiant and conduct disorder symptoms whereas youngsters with oppositional defiant disorder and conduct disorder (not otherwise specified) were included together in one group for the discriminant analysis. This should be kept in mind when interpreting the results on content-specificity. The dimensional analyses of conduct disorder symptoms are straightforward: as hypothesized, only the Impaired Limits domain showed a unique contribution in explaining the variance in conduct problems. Hence, adolescents with conduct disorder symptoms are predominantly characterized by the belief that they are superior and not bound by the rules of reciprocity that guide daily social interactions, and by the expectation that they are incapable of exercising sufficient self-control or frustration tolerance to achieve personal goals or inhibit the expression of

emotions and impulses. Interestingly however, in the case of oppositional defiant symptoms, the Disconnection/Rejection domain appeared almost equally important. Hence, adolescents with oppositional defiant disorder problems are also characterized by the belief that significant others are not available for (emotional) support in a predictable manner. The importance of the Disconnection/Rejection domain for understanding disruptive behaviour was also illustrated in the categorical analyses. In our opinion however, the latter results might have been blurred by including youngsters with oppositional defiant and conduct disorder together in one group.

For the purpose of the present study, we picked out four specific types of psychopathology, i.e, mood, anxiety, oppositional defiant and conduct disorder (symptoms). As mentioned, they were chosen because the existing theoretical literature on cognitive vulnerability (A. T. Beck, 1976; A. T. Beck et al., 1985; Clark et al., 1999) enabled us to formulate within Young's framework some concrete hypotheses on content-specificity in these disorders. However, many more types of psychological problems exist in children and adolescents (e.g.: attentional defiant hyperactivity disorder, adjustment disorder etc.). Hence, in future studies, it would be interesting to characterize the associated cognitive content for each of them.

A strength of Study 1 is the inclusion of a large sample. With respect to the study of maladaptive schemas in youth, this certainly adds to the existing literature. As earlier studies on the YSQ in youth were conducted in relatively small community samples, no adequate norm data are yet available. The present data collected in referred and non-referred youth provides European norm data for the YSQ-SF in adolescent boys and girls. These can be useful in research as well as in clinical practice.

Many studies within the cognitive framework have relied solely on self-report instruments and as such, the established correlations might at least partly be due to shared method variance (R. Beck & Perkins, 2001). At best, real

correlations are artificially inflated. At worst however, an actually non-existent association is considered real. By also questioning parents on the presence of psychopathology symptoms in their children, we aimed to control for the part of shared method variance that is caused by relying on one common rater for the assessment of predictor and outcome variables. Including different viewpoints on psychopathology clearly affects the strength of the established association with maladaptive schemas. Muris (2006) administered only adolescent report questionnaires, which lead to 52% explained variance in depressive and 38% explained variance in anxiety symptoms. In the present Study 2 the use of composite psychopathology resulted in respectively 23% and 25% explained variance in depressive and anxiety symptoms.

In a certain sense, the results of the clinical interview provide us with information from a third informant, as the KID-SCID is a so-called 'investigator-based' interview. But there's more: compared with self-report questionnaires, structured clinical interviews are in fact an alternative method to assess psychopathology. Whereas questionnaires measure *symptom* severity, interviews in addition assess the duration of a particular constellation of symptoms, as well as their interference with daily functioning. Therefore, structured clinical interviews are considered the 'gold standard' for the assessment of psychiatric *disorders* (Costello, Egger, & Angold, 2005). However, the use of clinical interviews, yielding only categorical outcome, is sometimes criticised as youngsters can be undiagnosed but still impaired (Angold, Costello, Farmer, Burns, & Erkanli, 1999). Self-report questionnaires generate dimensional data, representing psychopathology on a continuum, which probably does more justice to the concept. In short, a categorical taxonomy of disorders and a dimensional assessment of symptom severity seems an appropriate combination of methods to obtain a comprehensive assessment of the presence of psychopathology in youth.

An interesting future line of research would be to further elaborate on

the dimensionality of the schema concept. Van Leeuwen, Mervielde, De Clercq and De Fruyt (2007) proposed a stringent four-level test to examine quantitative versus qualitative differences between referred and non-referred youth. The first level is in keeping with the classical formulation of the spectrum idea and involves, when applied to the study of cognitive vulnerability and psychopathology, the investigation of mean differences in maladaptive schema scores between referred and non-referred samples, as was done in Study 2. On a second level, the hypothesis is examined more profoundly by studying the similarity of psychometric properties of cognitive vulnerability measures in referred and non-referred samples. In this regard, Rijkeboer and van den Bergh (2006) demonstrated the invariance of the YSQ 15-schema structure across referred and non-referred adults by means of multiple group confirmatory factor analysis. In future research, it would be interesting to investigate if these findings can be replicated in adolescents also. Unfortunately, the sample of Study 2 was too small to allow this kind of statistical analyses.

On a third level, one can investigate whether the correlation of maladaptive schemas and psychopathology is quantitatively (strength of the association) and qualitatively (nature of the association: positive versus negative) parallel in non-referred and referred groups. As outlined earlier, studies with the YSQ in youth have been constricted to either non-referred or referred samples. All together however, the results of these studies generally suggest a significantly positive association of maladaptive schemas and psychopathology in both populations. The present Study 2 was the first that included both a referred and a non-referred sample, which actually allowed us to test the similarity of not only the nature but also the strength of the latter association. However, given that the study of Young's theory in adolescents is scarcely out of the egg and hence the exploratory nature of Study 2, we conducted the analyses on the association of schemas and psychopathology and on content-specificity in the sample as a whole. When in future studies a relatively large

group of referred and non-referred youngsters is included, it would be worthwhile to consider parallel but separate statistical testing in both samples.

Finally, on a fourth level, it can be examined whether theoretically presumed mediator and moderator effects are present in both referred and non-referred individuals. The idea that dysfunctional schemas originate from adverse childhood experiences and subsequently lead to psychopathology, describes a *mediational* process. As mentioned in the introduction, Lumley and Harkness (2007) established in a referred sample of depressed adolescents how specific schemas mediate the association of adverse childhood experiences (e.g., emotional maltreatment, physical abuse) on the one hand and anxiety and depressive symptoms on the other hand. It would be interesting to examine whether this mediation hypothesis holds in non-referred adolescents as well and/or can be extended to other forms of childhood adversity (e.g., more subtle maladaptive parenting practices such as overprotection or psychological control) and psychopathology (e.g., anxiety, disruptive behavior or eating pathology). In this regard, it should be noted that an adequate test of cognitive theory's mediational component actually requires a longitudinal design.

Cognitive theory's diathesis-stress component comes down to the hypothesis that maladaptive schemas *moderate* the association between currently experienced stress and psychopathology. In this regard, Schmidt and Joiner (2004) for example evidenced in a non-referred adults sample the moderating role of Young's schemas in the association of negative life-events and psychological distress. No similar studies exist in youth. Hence, in future research, the tenability of the diathesis-stress component in Young's theory should be investigated. Given the abovementioned mediational process, it would, from a developmental perspective, be interesting to investigate at what age Young's maladaptive schemas actually start operating as vulnerability factors (moderators) in confrontation with stress. To adequately address this issue, longitudinal designs are needed in which children and adolescents of different

age groups are questioned on stress, cognitive vulnerability and psychopathology at several time points. Subsequently, the fit of mediational versus moderational models to describe the association between these variables should be tested separately for several age groups. Finally, as suggested by Van Leeuwen and colleagues (2007), it would be interesting to examine whether the same conclusions on this matter can be drawn for referred and non-referred youngsters.

Further, an interesting future research perspective would be to unravel the associations between Young's schema taxonomy and (adult) attachment. Bowlby (1969) introduced the concept of 'internal working model', which is often criticized for lacking explanatory power and being too vague and encompassing (Waters & Waters, 2006). Recently, the internal working model of attachment has often been compared to cognitive theory's concept of maladaptive schemas, leading to the idea that attachment might function as a mediator between childhood experiences and adult schemas (Platts, Tyson, & Mason, 2002). Mason, Platts and Tyson (2005) for example demonstrated that different Young schemas are associated with different adult attachment styles. Unfortunately, Mason et al. (2005) distinguished between different attachment categories, whereas recently it was argued that attachment is preferentially conceptualised dimensionally (Fraley & Spieker, 2003). In this regard, Brennan, Clark and Shaver (1998) distinguished between a dimension of attachment anxiety (fear of being abandoned) and a dimension of attachment avoidance (discomfort with closeness). It would for example be interesting to investigate if Young's schema domains are differentially related to attachment anxiety and attachment avoidance. Ideally in longitudinal designs, the mediating role of these attachment styles in the association of childhood adversity and Young's domains and the mediating role of these schema domains in the association of attachment and psychopathology should be investigated.

To conclude, the findings on content-specificity indicate that different

(combinations of) schema domains are active in different mental disorders in youth. From a clinical perspective, these findings suggest that different cognitive themes should be targeted in treatment of adolescents with mood, anxiety, oppositional defiant and conduct disorder (symptoms). Manuals that were developed for cognitive treatment of these disorders could be analyzed on the extent to which they effectively address the relevant schema domains and can be improved accordingly. In cognitive theory, it is assumed that maladaptive schemas develop early in life and are etiologically related to the onset and maintenance of mental disorders. In this respect, prevention programmes for anxiety, depression and disruptive behaviour targeting parents, should aim to prevent that dysfunctional schemas originate early in development.

Acknowledgements

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Tables

Table 1. *Schema descriptions, domain descriptions and exemplary YSQ-SF items (Young et al., 2003)*

SCHEMAS/DOMAINS	DESCRIPTION	EXEMPLARY YSQ-SF ITEM
Disconnection/Rejection	*Expectation that one's needs for security, safety, stability, nurturance, empathy, sharing of feelings, acceptance and respect will not be met in a predictable manner.*	
Abandonment/Instability	The perceived instability or unreliability of those available for support and connection.	'I need other people so much that I am afraid of losing them'
Mistrust/Abuse	The expectation that others will hurt, abuse, humiliate, cheat, lie, manipulate or take advantage.	'I feel I have to watch out with other people, otherwise they will deliberately hurt me'
Emotional Deprivation	The expectation that one's desire for a normal degree of emotional support will not be adequately met by others.	'In my life there have been few people who really listened to me, understood me or who considered my real needs and feelings'
Defectiveness/Shame	The feeling that one is defective, bad, unwanted, inferior or invalid in important respects or that one would be unlovable to significant others if exposed.	'None of the boys or girls that I like could still love me if they knew my flaws'
Social Isolation/Alienation	The feeling that one is isolated form the rest of the world, different form other people, and/or not part of any group or community.	'I do not belong; I'm a loner'
Impaired Autonomy/Performance	*Expectations about oneself and the environment that interfere with one's perceived ability to separate, survive, function independently or perform successfully.*	
Dependence/Incompetence	The belief that one is unable to handle one's everyday responsibilities in a competent manner without considerable help from others.	'I am not very confident in my ability to resolve common everyday problems'
Vulnerability to Harm/Illness	Exaggerated fear that imminent catastrophe will strike at	'I am scared of me and/or my family losing all our

	any time and that one will be unable to prevent it.	money and becoming poor'
Enmeshment/Undeveloped Self	Excessive emotional involvement and closeness with one or more significant others (often parents) at the expense of full individuation or normal social development.	'I have not been capable of separating from my parent(s) like most other kids my age seem to have managed'
Failure	The belief that one has failed, will inevitably fail or is fundamentally inadequate relative to one's peers.	'Most people can do more than I can in the areas of school and other achievements'
Impaired Limits	*Deficiency in internal limits, responsibility to others or long-term goal orientation; leads to difficulty respecting the rights of others, cooperating with others, making commitments or setting and meeting personal goals.*	
Entitlement/Grandiosity	The belief that one is superior to other people, entitled to special rights and privileges or not bound by the rules of reciprocity that guide normal social interaction.	'I feel that what I have to offer is of greater value than the things other people have to offer'
Insufficiënt Self-Control/Self-Discipline	Pervasive difficulty of refusal to exercise sufficient self-control and frustration tolerance to achieve one's personal goals or to restrain the expression of one's emotions and impulses.	'If I am unable to achieve a goal, I get easily frustrated and give up'
Other-Directedness	*An excessive focus on the desires, feelings and responses of others at the expense of one's own needs in order to gain love and approval, maintain one's sense of connection or avoid retaliation.*	
Subjugation	Excessive surrendering of control to others because one feels coerced submitting in order to avoid anger, retaliation or abandonment.	'I find it very difficult to stand up for my rights and insist that my feelings are taken into consideration'
Self-Sacrifice	Excessive focus on voluntarily meeting the needs of others the expense of one's own gratification.	'I am so busy doing for the people I care about that there is little time left for me'
Overvigilance/Inhibition	*Excessive emphasis on suppressing one's spontaneous feelings, impulses and choices or on meeting rigid,*	

	internalized rules and expectations about performance and ethical behaviour, often at the expense of happiness, self-expression, relaxation, close relationships or health.	
Emotional Inhibition	The excessive inhibition of spontaneous action, feeling or communication, usually to avoid disapproval by others, feelings of shame or losing control of one's impulses.	'I am embarrassed about showing my feelings to other people'
Unrelenting Standards/Hypercriticalness	The belief that one must strive to meet very high internalized standards of behavior and performance, usually to avoid criticism.	'I try to do my level best; I do not settle for 'good enough''

Table 2. *Goodness-of-fit indices for the different first and second order YSQ models tested in adolescents*

	Model	χ^2 (df)	χ^2/df	CFI	TLI	RMSEA	SRMR
				Fit indices			
1.	15 first order factors (Young et al., 2003)	4371.06 (2595)	1.68	0.86	0.85	0.03	0.05
2.	One single first order factor	7881.75 (2700)	2.92	0.59	0.58	0.06	0.07
3.	Five second order factors (Young et al., 2003)	4645.21 (2675)	1.74	0.84	0.84	0.03	0.06
4.	Four second order factors (Hoffart et al., 2005)	4642.78 (2678)	1.73	0.84	0.84	0.03	0.06
5.	Three second order factors (Calvete et al., 2005)	4675.56 (2682)	1.74	0.84	0.84	0.03	0.06
6.	Three second order factors (Muris, 2006)	4678.10 (2682)	1.74	0.84	0.84	0.03	0.06
7.	One single second order factor	4759.46 (2685)	1.77	0.84	0.83	0.04	0.06

Note. CFI = Comparative Fit Index; TLI = Tucker-Lewis index; RMSEA = Root-mean-square error of approximation; SRMR = standardized root-mean-square residual

Table 3. *Cronbach alphas and norm data for non-referred boys and girls on the adolescent YSQ-SF subscales*

	α	Non-referred group (n=635) Boys (n=283)	Girls (n=352)	Total
Disconnection/Rejection	.92	1.87 (0.61)	2.05 (0.70)	1.97 (0.66)
- Emotional Deprivation	.79	1.69 (0.76)	1.76 (0.86)	1.72 (0.82)
- Abandonment/Instability	.85	2.29 (1.04)	2.73 (1.14)	2.53 (1.12)
- Mistrust/Abuse	.72	2.09 (0.77)	2.19 (0.82)	2.14 (0.80)
- Social Isolation/Alienation	.82	1.76 (0.77)	1.90 (0.83)	1.84 (0.81)
- Defectiveness/Shame	.76	1.55 (0.59)	1.67 (0.73)	1.62 (0.68)
Impaired Autonomy/Performance	.87	1.87 (0.55)	2.11 (0.64)	2.00 (0.61)
- Failure to Achieve	.82	1.75 (0.69)	2.01 (0.85)	1.89 (0.79)
- Dependence/Incompetence	.74	1.80 (0.69)	2.02 (0.72)	1.92 (0.71)
- Vulnerability to Harm or Illness	.77	1.94 (0.83)	2.27 (0.97)	2.12 (0.93)
- Enmeshment/Undeveloped Self	.64	1.97 (0.72)	2.14 (0.81)	2.06 (0.78)
Impaired Limits	.79	2.41 (0.72)	2.43 (0.72)	2.42 (0.76)
- Entitlement/Grandiosity	.71	2.22 (0.81)	2.21 (0.77)	2.21 (0.79)
- Insufficient Self-Control/Self-Discipline	.74	2.60 (0.90)	2.64 (0.90)	2.62 (0.90)
Other-Directedness	.77	2.40 (0.64)	2.56 (0.69)	2.49 (0.67)
- Subjugation	.71	1.95 (0.70)	2.03 (0.78)	1.99 (0.75)
- Self-Sacrifice	.74	2.85 (0.85)	3.10 (0.88)	2.99 (0.87)
Overvigilance/Inhibition	.84	2.48 (0.73)	2.35 (0.78)	2.41 (0.76)
- Emotional Inhibition	.83	2.23 (0.92)	2.11 (0.94)	2.16 (0.94)
- Unrelenting Standards/Hypercriticalness	.74	2.74 (0.96)	2.60 (0.98)	2.66 (0.97)

Table 4. *Cronbach alphas, means and standard deviations for non-referred and referred youngsters on the YSR and the CBCL*

	Non-referred group		Referred group		
	α	M (SD)	α	M (SD)	F
YSR - Internalizing problems	.88	51.41 (10.18)	.93	59.31 (11.03)	29.41***
YSR – Externalizing problems	.84	52.20 (8.78)	.86	57.11 (9.34)	15.59***
YSR – Affective problems	.76	54.34 (6.01)	.83	61.44 (9.40)	43.86***
YSR – Anxiety problems	.54	54.81 (5.57)	.58	57.65 (7.25)	10.33**
YSR – Oppositional defiant problems	.53	53.80 (4.85)	.54	55.68 (6.37)	5.89*
YSR – Conduct problems	.68	55.42 (5.58)	.78	58.69 (7.95)	12.23***
CBCL - Internalizing problems	.86	50.10 (9.91)	.92	65.18 (9.87)	113.56***
CBCL – Externalizing problems	.91	47.87 (9.91)	.92	62.15 (9.43)	105.81***
CBCL – Affective problems	.76	54.16 (5.94)	.79	66.69 (9.35)	131.34***
CBCL – Anxiety problems	.59	54.35 (5.61)	.76	63.20 (8.65)	75.52***
CBCL – Oppositional defiant problems	.79	53.17 (4.86)	.77	60.18 (7.70)	60.83***
CBCL – Conduct problems	.75	53.15 (4.44)	.87	61.33 (8.56)	75.36***

Note. YSR = Youth Self Report; CBCL = Child Behavior Checklist; *p* < .05; **p* <= . 01; ***p* <=.001.

Table 5. *Prevalence of DSM-IV disorders based on administration of structured clinical interviews in the non-referred and the referred group*

	Non-referred group		Referred group	
	n	*%*	*n*	*%*
- Attention Deficit Hyperactivity Disorder	5	4.46	17	16.67
- Oppositional Defiant Disorder	0	0.00	17	16.67
- Conduct Disorder	0	0.00	16	15.69
- Conduct Disorder - Not Otherwise Specified	0	0.00	3	2.94
- Major Depressive Disorder	0	0.00	15	14.71
- Manic Episode	0	0.00	2	1.96
- Hypomanic Episode	0	0.00	1	0.98
- Dysthymic Disorder	0	0.00	3	2.94
- Major Depressive Disorder –NOS	0	0.00	2	1.96
- Separation Anxiety Disorder	0	0.00	2	1.96
- Social Phobia	0	0.00	3	2.94
- Specific Phobia	1	0.89	8	7.84
- Obsessive Compulsive Disorder	0	0.00	3	2.94
- Post Traumatic Stress Disorder	0	0.00	4	3.92
- Generalized Anxiety Disorder	0	0.00	7	6.86
- Panic Disorder	0	0.00	0	0.00
- Agoraphobia	0	0.00	0	0.00
- Anxiety Disorder – Not Otherwise Specified	0	0.00	4	3.92
- Adjustment Disorder	0	0.00	6	5.88

Note. For the construction of the categorical mood disorder measure (see data analysis section), youngsters with *comorbid* mood disorder diagnoses were only counted once. Consequently, the total number of youngsters suffering from *at least* one mood disorder, does not equal the mere summation of the number of individual mood disorder diagnoses. The same holds for the construction of the categorical anxiety disorder measure

Table 6. *Cronbach alphas and norm data for referred and non-referred boys and girls on the YSQ-SF subscales*

		Non-referred group (n=112)				Referred group (n=104)			
	α	Boys (n=74)	Girls (n=38)	Total	α	Boys (n=63)	Girls (n=41)	Total	F
Disconnection/Rejection	.92	1.91 (0.56)	1.84 (0.61)	1.89 (0.58)	.95	2.19 (0.92)	2.64 (1.03)	2.37 (0.98)	16.99***
Emotional Deprivation	.70	1.70 (0.62)	1.46 (0.49)	1.62 (0.59)	.84	1.95 (0.99)	2.27 (1.30)	2.08 (1.13)	15.52***
Abandonment/Instability	.85	2.39 (0.93)	2.61 (1.17)	2.47 (1.02)	.86	2.76 (1.27)	3.55 (1.49)	3.07 (1.41)	12.06***
Mistrust/Abuse	.79	2.11 (0.73)	2.03 (0.90)	2.08 (0.79)	.85	2.31 (1.07)	2.80 (1.37)	2.50 (1.21)	8.43**
Social Isolation/Alienation	.78	1.76 (0.63)	1.62 (0.67)	1.71 (0.65)	.85	2.10 (1.11)	2.41 (1.07)	2.22 (1.10)	14.28***
Defectiveness/Shame	.76	1.61 (0.58)	1.48 (0.45)	1.56 (0.54)	.85	1.82 (0.96)	2.20 (1.17)	1.97 (1.06)	10.09**
Impaired Autonomy/Performance	.88	2.04 (0.58)	2.02 (0.56)	2.03 (0.57)	.92	2.19 (0.83)	2.56 (1.03)	2.33 (0.92)	6.73**
Failure to Achieve	.81	1.96 (0.72)	1.93 (0.58)	1.95 (0.67)	.88	2.14 (1.02)	2.63 (1.30)	2.34 (1.16)	7.34**
Dependence/Incompetence	.66	2.07 (0.66)	1.99 (0.65)	2.04 (0.65)	.84	2.06 (0.97)	2.28 (1.12)	2.15 (1.03)	1.03
Vulnerability to Harm/Illness	.82	2.03 (0.79)	2.20 (0.87)	2.09 (0.82)	.85	2.30 (1.10)	2.85 (1.40)	2.51 (1.25)	6.99**
Enmeshment/Undeveloped Self	.63	2.11 (0.73)	1.96 (0.65)	2.06 (0.71)	.78	2.24 (1.01)	2.49 (1.23)	2.34 (1.10)	4.03*
Impaired Limits	.79	2.58 (0.70)	2.40 (0.65)	2.52 (0.68)	.81	2.49 (0.80)	2.76 (0.85)	2.59 (0.83)	1.25
Entitlement/Grandiosity	.72	2.29 (0.70)	2.09 (0.76)	2.22 (0.72)	.67	2.39 (0.87)	2.34 (0.83)	2.37 (0.85)	3.13
Insufficient Self-Control	.76	2.87 (0.97)	2.71 (0.76)	2.81 (0.91)	.76	2.59 (0.95)	3.19 (1.06)	2.82 (1.03)	0.28
Other Directedness	.74	2.60 (0.61)	2.60 (0.62)	2.60 (0.61)	.82	2.60 (0.75)	3.29 (1.00)	2.87 (0.91)	7.25**
Subjugation	.80	2.13 (0.84)	1.99 (0.70)	2.09 (0.79)	.80	2.17 (0.85)	2.79 (1.24)	2.42 (1.06)	6.61**
Self-Sacrifice	.73	3.07 (0.80)	3.20 (0.89)	3.11 (0.83)	.77	3.03 (0.88)	3.79 (1.21)	3.33 (1.08)	4.21*
Overvigilance/Inhibition	.78	2.61 (0.72)	2.17 (0.61)	2.46 (0.71)	.86	2.41 (0.84)	2.86 (1.17)	2.59 (1.00)	2.31
Emotional Inhibition	.85	2.41 (0.95)	1.92 (0.74)	2.25 (0.91)	.85	2.25 (1.07)	2.77 (1.24)	2.46 (1.16)	2.94
Unrelenting Standards	.64	2.79 (0.88)	2.42 (0.68)	2.67 (0.83)	.81	2.57 (1.02)	2.96 (1.35)	2.72 (1.17)	1.16

Note. *p < .05; **p < .01; ***p < .001

Table 7. *Partial correlations between adolescent schema and schema domain scores and internalizing and externalizing problem behaviour symptoms*

	Internalizing symptoms	Externalizing symptoms
Disconnection/Rejection	.39***	.07
Emotional Deprivation	.25***	.10
Abandonment/Instability	.28***	.10
Mistrust/Abuse	.33***	.02
Social Isolation/Alienation	.44***	-.07
Defectiveness/Shame	.28***	.12
Impaired Autonomy/Performance	.40***	.01
Failure to Achieve	.34***	.01
Dependence/Incompetence	.29***	-.02
Vulnerability to Harm or Illness	.35***	-.02
Enmeshment/Undeveloped Self	.30***	.05
Impaired Limits	.11	.23***
Entitlement/Grandiosity	.05	.23***
Insufficient Self-Control/Self-Discipline	.12	.16**
Other-Directedness	.35***	.02
Subjugation	.32***	.09
Self-Sacrifice	.25***	-.05
Overvigilance/Inhibition	.33***	-.06
Emotional Inhibition	.30***	-.03
Unrelenting Standards/Hypercriticalness	.26***	-.08

*Note. *$p < .05$; ***$p < .01$; ****$p < .001$

Chapter 7

Parenting origins of dysfunctional schemas in youngsters referred for antisocial behaviour problems demonstrating depressive symptoms[1]

Based on Young's schema theory, this study aimed to investigate the parenting origins of dysfunctional schemas in a sample of depressed and non-depressed youngsters referred for antisocial behaviour problems and in a non-depressed non-referred control group. Particpants were 82 children and adolescents (aged 8-18 years). Differences between groups were situated in parenting practices related to Young's schema domain Disconnection/Rejection. Hence, referred antisocial youngsters who demonstrate depressive symptoms perceive their parents as more cold, instable, unreliable, and unpredictable than do non-depressed controls. Generally speaking, these youngsters expect to a larger extent that their parents will not meet their need for security, stability, empathy, acceptance and respect in a predictable manner. In treatment of antisocial youngsters the existence of a depressive subgroup characterized by specific maladaptive parenting practices should be recognized.

[1] Van Vlierberghe, L., Timbremont, B., Braet, C., & Basile, B. (2007). Parental schemas in youngsters referred for antisocial behaviour problems demonstrating depressive symptoms. *The Journal of Forensic Psychiatry and Psychology, 18*, 515-533.

Introduction

With a prevalence rate of 4-10% in the general population, antisocial behaviour is the most common mental health problem in children and adolescents (Bierman et al., 1992). Moreover, the ability of therapeutic interventions to counteract antisocial behaviour in adolescents seems rather limited (Kazdin, 1987). Therefore, the annual figures on juvenile delinquency are still terribly high (Loeber, 1982; Loeber & Hay, 1997). The costs of children, and in particular adolescents, displaying antisocial behaviour are tremendous, for their families as well as for the educational system and society as a whole (Scott, Knapp, Henderson, & Maughan, 2001). Antisocial behaviour in children and adolescents can thus be considered a major social problem (Greenwood, Model, Rydell, & Chiesa, 1996; Loeber & Hay, 1997). Clinicians and researchers have paid much attention to disruptive behaviour disorders, urged on by an increasing concern for prevention and treatment. However, many questions remain unanswered, partly because the specific mechanisms related to treatment success and failure have not yet been identified (Burke, Loeber, & Birmaher, 2002).

A commonly neglected issue is the comorbidity of disruptive behaviour disorders and depression, which has been well established in community and referred samples of youngsters (Ben-Amos, 1992). In these cases, antisocial behaviour sometimes 'masks' the depression as it is mainly the externalizing problems that lead to referral (Hammen & Compas, 1994). The developmental sequence of depression and disruptive behaviour disorders has remained unclear (Loeber, Burke, Lahey, Winters, & Zera, 2000) but in identifying pathological processes, Angold, Costello and Erkanli (1999) consider it unwarranted to distinguish between so-called primary and secondary disorders. However, in youngsters referred for antisocial behaviour, depressive symptoms frequently complicate intervention (Loeber et al., 2000). Furthermore, comorbid conduct and depressive conditions may be an important risk factor for substance use in

early adolescence (Miller-Johnson, Lochman, Coie, Terry, & Hyman, 1998). Hence, further research is needed to highlight the clinical implications of this comorbidity.

One theory that has generated a vast body of empirical research on depression, even in children and adolescents, is Beck's cognitive theory (Beck, 1967; Beck, Rush, Shaw, & Emery, 1979). Cognitive theories try to explain the development and maintenance of depression by focusing on the role of schemas. Maladaptive schemas are defined as cognitive structures that bias information processing regarding the self, others and the world and give rise to negative automatic thoughts and depressive feelings (Clark, Beck, & Alford, 1999). As such, within cognitive theory, these dysfunctional schemas are considered a vulnerability or diathesis for the development of depression.

Little attention has been given to the mechanisms through which maladaptive schemas might arise. Research suggests that interpersonal processes, in particular disrupted parent-child interactions, play a prominent role in the pathogenesis of depression (Ingram, 2003). Cole and colleagues investigated the impact of parental feedback on children and suggest that negative feedback from significant others may be internalized in the form of negative self-referent thoughts or schemas, which then function as a diathesis that mediates the relation between negative feedback and depression (Cole, 1991; Cole & Turner, 1993).

Less research has been done on the association of negative parental feedback and antisocial behaviour. There is some evidence that parental negativity influences disruptive behaviour (Burke et al., 2002), but not all antisocial youngsters experience depressive symptomatology. Therefore, the aim of the present study was to look for the parenting origins of dysfunctional schemas in depressed versus non-depressed antisocial youth.

Elaborating on Beck's theory, Young (Young, Klosko, & Weishaar, 2003) defines a maladaptive schema as 'a broad pervasive theme or pattern

comprised of memories, emotions, cognitions and bodily sensations regarding oneself and one's relationships with others, developed during childhood or adolescence, elaborated throughout one's lifetime and dysfunctional to a significant degree'. Again, a child's experience of being parented is considered the fundament of the dysfunctional schema. Based on clinical experience, Young distinguished various maladaptive schemas, grouped within five schema domains, reflecting basic childhood needs, i.e., acceptance, autonomy, limit setting, reciprocity, and free expression. He developed an instrument to assess these schemas, the Young Schema Questionnaire (YSQ: Young & Brown, 1990) and a questionnaire to measure the parenting origins of each schema, the Young Parenting Inventory (YPI: Young, 1994). Young's schema theory might thus help to distinguish between different types of perceived parenting experiences. Table 1 gives an overview of the different maladaptive schemas/domains as outlined by Young, a description of the typical family of origin of people endorsing these schemas and an exemplary YPI-item for each parenting practice.

Studies with the YSQ in adults support its psychometric properties (e.g.: Lee, Taylor, & Dunn, 1999; Rijkeboer & van den Bergh, 2006; Rijkeboer, van den Bergh, & van den Bout, 2005; Schmidt, Joiner, Young, & Telch, 1995) and suggest that especially dysfunctional schemas in the Disconnection/Rejection domain are linked to depression (see e.g.: Calvete, Estevez, de Arroyabe, & Ruiz, 2005). Recently, Sheffield, Waller, Emanuelli, Murray and Meyer (2005) used the YPI to study perceived parenting experiences and their association with Young's maladaptive schemas in a student sample. The incorporation of Young's model in child and adolescent psychopathology research is still in its infancy. Until now, only four studies made use of the YSQ to investigate maladaptive schemas in youth (Cooper, Rose, & Turner, 2005; Lumley & Harkness, 2007; Muris, 2006; Turner, Rose, & Cooper, 2005). As far as we know, the link between perceived parenting experiences as measured with the

YPI on the one hand and psychopathology on the other hand has not yet been investigated, either in adults, or in children.

Based on Young's schema theory, the present study aimed to examine, within Young's framework, the parenting origins of maladaptive schemas in a group of youngsters referred for severe externalizing problems who also report considerable depressive symptoms. This group was compared with two control groups: a group of referred youngsters without depressive symptoms on the one hand and a non-referred group of children and adolescents without depressive symptoms on the other hand. Including two control groups enabled us to gain insight in specific types of parenting that are related to the comorbid conditions (depression and conduct problems) rather than solely to referral status or to externalizing problems.

Based on theoretical assumptions (Clark et al., 1999; Stark & Smith, 1995) and on previous research on dysfunctional schemas in depression (Calvete et al., 2005), it was hypothesized that especially parenting practices related to the Disconnection/Rejection schema domain would be found in the comorbid group. These generally cover the perception that parents do not fulfil the child's need for security, stability, empathy, and acceptance, and are specifically comprised of parenting experiences related to the following maladaptive schemas: Abandonment/Instability, Emotional Deprivation, Mistrust/Abuse and Defectiveness/Shame.

Further, most studies on children's perceptions of their parents focused exclusively on mother representations; little is known about the association between father-child interactions and depression (Kane & Garber, 2004). The present study aimed to extend previous findings by assessing children's perceptions of both the mother and the father.

Method

Participants

The sample included 82 children and adolescents. One group of 41 youngsters was recruited from two inpatient settings. Both institutes are officially recognized psychosocial services for the re-education of children and adolescents with severe externalizing problems. Youngsters are referred by juvenile court if their behaviour is considered a danger to themselves and/or their environment. Another group of 41 children and adolescents were recruited via schools (non-referred group). The mean age of the children and adolescents was 12.60 ($SD = 2.40$, range 8-18). There were 62 boys and 20 girls.

Measures

Structured Clinical Interview for DSM-IV - Childhood version. The disruptive behaviour and mood disorder module of the Structured Clinical Interview for DSM-IV - Childhood version (KID-SCID: Dreessen, Stroux, & Weckx, 1998; Hien et al., 1994) was administered to the children and adolescents from the referred group. The KID-SCID is based on the SCID for adults (Spitzer, Williams, & Gibbon, 1986), a widely used diagnostic interview that has acceptable reliability and validity (Spitzer, Williams, Gibbon, & First, 1992; Williams et al., 1992). Similar to the adult version, the KID-SCID is a semi-structured instrument designed to generate childhood DSM-IV diagnoses for clinical research studies. Psychometric studies are still ongoing, but preliminary results show fair to excellent test-retest reliability for the disruptive behaviour disorders (between .63 and .84) (Matzner, Silva, Silvan, Chowdhury, & Nastasi, 1997). Pilot data also indicate excellent interrater reliability in the disruptive behaviour module (.84 for Oppositional Deviant Disorder and Conduct Disorder and 1.0 for Attention Disorder Hyperactivity Disorder) (Matzner, 1994). Timbremont, Braet and Dreessen (2004) found similar values

for interrater reliability in the disruptive behaviour and the mood disorders modules.

Children's Depression Inventory. The children and adolescents completed a Dutch version of the Children's Depression Inventory (CDI: Kovacs, 1992; Timbremont & Braet, 2002) to assess current mood. The CDI is used with children and adolescents aged 7-17 and includes 27 items measuring the cognitive, affective and behavioural symptoms of depression in children. Each item consists of three statements, and children select the item that characterised them best during the previous two weeks. The statements are graded in order of increasing severity from 0 to 2; item scores are combined into a total depression score. The original questionnaire has relatively high levels of internal consistency, test-retest reliability, and predictive, convergent and construct validity, especially in non-clinical populations (Craighead, Smucker, Craighead, & Ilardi, 1998). Psychometric results for the Dutch version are promising. The internal consistency of the Dutch CDI is .80, the one-month test-retest reliability is .81 (Timbremont & Braet, 2002).

Young Parenting Inventory. The Young Parenting Inventory (Young, 1994) is a self-report questionnaire assessing perceived parental experiences during childhood and adolescence. The YPI is designed to identify the parenting origins of the maladaptive schemas identified by Young (Young et al., 2003). The questionnaire consists of 72 items which break down into 17 specific maladaptive parenting practices. Respondents are asked to rate how they experience their parents' attitude and behaviour towards them on a 6-point Likert scale (1 = 'completely untrue', 6 = 'describes him/her perfectly'). Two versions were administered: a version with statements about the mother and a version with statements about the father.

Generally, the parenting practices linked to Young's first schema domain, Disconnection/Rejection, refer to a child's experience that his/her parents are unstable, abusive, cold and/or rejecting. This parenting style may

eventually lead to the development of the maladaptive schemas Abandonment/Instability, Mistrust/Abuse, Emotional Deprivation and Defectiveness/Shame. The parenting practices related to Young's second schema domain, Impaired Autonomy/Performance, generally involve a child's experience that his/her parents are overprotective and undermining of his/her self-confidence. Such practices may eventually lead to the development of the dysfunctional schemas Dependence/Incompetence, Vulnerability to Harm or Illness, Enmeshment/Undeveloped Self, and Failure. Generally, the parenting practices related to Young's third schema domain, Impaired Limits, include permissiveness and a lack of direction provided by the parents. These may give rise to the maladaptive schemas Entitlement/Grandiosity and Insufficient Self-Control/Self-Discipline. The parenting practices related to Young's fourth domain, Other-Directedness, refer to a child's experience that the parents' emotional needs are valued more than his/her unique needs. Out of such patenting experiences, the maladaptive schemas Subjugation, Self-Sacrifice, and Approval-Seeking/Recognition-Seeking may originate. Finally, the parenting practices related to Young's fifth schema domain, Overvigilance/Inhibition, concern a demanding and punitive parenting style in which performance and perfectionism predominate over pleasure. Such parenting may lead to the development of the maladaptive schemas Negativity/Pessimism, Emotional Inhibition, Unrelenting Standards/Hypercriticalness, and Punitiveness.

The YPI was translated in Dutch, and some items were rephrased to be more comprehensible to children and adolescents. The Dutch translation was piloted with a small group of youngsters and adaptations were based on the children's comments. The internal consistency for both versions of the questionnaire in the present study was promising (Cronbach alpha YPI-Mother = 0.90, YPI-Father = 0.89).

Psychometric research on the YPI is scarce. As far as we know, only Sheffield and colleagues (2005) have used the YPI, with a student sample (n =

422; age 18-61). Sheffield et al. undertook a preliminary psychometric evaluation of the YPI in order to test the link between parenting (YPI) and maladaptive self-schemas (YSQ) as identified by Young. Based on factor analyses of both the mother version and the father version, a revised YPI (YPI-R) was constructed, including only those items and factors common to both parents that showed acceptable internal consistency and test-retest reliability. Nine factors (with a total of 37 items) common to both parents were retained. All nine scales showed good test-retest reliability. Significant and clinically meaningful correlations between the YPI-R and the YSQ were found (Sheffield et al., 2005). At the time the present study was conducted, no research on the YPI was available, and therefore the original YPI was used.

Procedure

The institutional review board of Ghent University fully approved this study. Children and adolescents between 8 and 18 years with normal intelligence and without pervasive developmental disorder were included. After explaining the objectives and the procedure of the study, informed consent was obtained from 45 (100%) youngsters and parents in the referred group, and from 58 (96.67%) in the non-referred group. The CDI, the YPI-Mother, and the YPI-Father were administered in random order. Four children (8.8%) withdrew from the referred group during the study. One child from the non-referred group accidentally skipped some pages of the YPI and was therefore omitted from further analyses. Hence, 98 participants were eligible.

All youngsters completed the CDI, and in addition the referred youngsters were interviewed with the KID-SCID. As suggested by Kovacs (1992), a cut-off score of 13 on the CDI was used to define depressive symptomatology. The group of referred children and adolescents with a KID-SCID mood disorder diagnosis and/or a CDI score of 13 or above were denoted

the 'referred symptomatic group' (n = 13)[2]. Referred children and adolescents with a CDI total score below 13 comprised the 'referred non-depressed group' (n = 28). A non-referred control group of non-depressed youngsters was created out of the children and adolescents recruited via schools (n=57) by omitting those with a CDI score equal to or above 13 (21.05%). Of the 45 youngsters in this non-referred group, four young girls were randomly omitted from further analyses to equalize the referred to the non-referred in terms of number, age and gender.

Statistical Analyses

First of all, a Multivariate Analysis of Variance (MANOVA) was run with the YPI total domain scores[3] as individual variables. For the domains that significantly differed between groups, a separate MANOVA was conducted, one for each domain, with the YPI schemas[3] as individual variables. This was done separately for the YPI-Mother and the YPI-Father.

Results

Descriptives

The referred symptomatic group consisted of nine boys and four girls, the referred non-depressed group included 25 boys and three girls, and the non-

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[2] Although depression can be seen as a categorical variable, some authors draw attention to the fact that youngsters can be undiagnosed but seriously impaired (Angold, Costello, Farmer, Burns, & Erkanli, 1999). According to Timbremont and colleagues (2004) the CDI is an adequate screening instrument for depressive symptomatology. Therefore, antisocial youngsters who received no mood disorder diagnosis on the clinical interview but who exhibited depressive symptomatology (CDI-score >= 13), were also included in the referred symptomatic group.

[3] It should be clear by now that the YPI does *not* measure maladaptive schemas or schema domains. The YPI assesses specific parenting practices that may eventually lead to the development of Young's maladaptive schemas belonging to specific schema domains. However, to be concise, the results will be reported by immediately referring to these maladaptive schemas and schema domains, instead of mentioning 'the parenting practices related to the maladaptive schema (domain)…' each time.

referred group consisted of 28 boys and 13 girls. The three groups did not differ in gender distribution, χ^2 (2) = 4.32; p = .12, or in age, F (2,79) = 2.80, p = .07. Group differences on CDI scores were found, F (2,79) = 34.10, p < .001: the referred symptomatic group scored more highly than both the referred non-depressed group, p < .001, and the non-referred group, p < .001. The two non-depressed groups did not differ from each other in terms of CDI scores, p = .99. Mean ages and CDI scores are given in Table 2.

Based on the structured clinical interview administered to the children and adolescents in the referred group, 27 youngsters (65.85%) received a disruptive behaviour disorder diagnosis: Attention Disorder Hyperactivity Disorder (ADHD), Oppositional Deviant Disorder (ODD), or Conduct Disorder (CD). Furthermore, 11 youngsters (26.83%) did not meet DSM-IV criteria for a full-blown diagnosis but suffered from severe subclinical symptomatology. Disruptive behaviour disorder diagnoses were equally distributed in the referred symptomatic and the referred non-depressed group, χ^2 (1) = 2.52, p = .11, for ADHD, χ^2 (1) = .15, p = .70, for ODD, χ^2 (1) = 2.45, p = .12, for CD. Five youngsters (12.2%) obtained a diagnosis of mood disorder - four on top of their disruptive behaviour disorder diagnosis. Eight youngsters were assigned to the referred symptomatic group because of high levels of depressive symptomatology (mean CDI score: 16.25) although they received no mood disorder diagnosis.

Maternal parenting

An overall MANOVA to compare the three groups on the domain scores of the YPI-Mother revealed an overall significant effect, F(5,74) = 3.96, p < .001, due to group differences on the Disconnection/Rejection domain, F(2,78) = 8.97, p < .001, η^2 = .03. Post-hoc analyses for this domain revealed that the referred symptomatic group scored more highly than both the referred non-depressed group, p < .05, and the non-referred group, p <. 001. No differences

were found between the latter two groups, $p = .18$. As this MANOVA revealed no significant differences in the other maternal schema domains, these were not included in further analyses.

A MANOVA performed separately for the Disconnection/Rejection domain revealed significant differences for all constituent schemas: Abandonment/Instability, $F(2,79) = 5.98$, $p < .01$, $\eta^2 = .05$, Mistrust/Abuse, $F(2, 79) = 4.07$, $p < .05$, $\eta^2 = .02$, Emotional Deprivation, $F(2, 79) = 7.55$, $p < .01$, $\eta^2 = .06$, and Defectiveness/Shame, $F(2, 79) = 8.95$, $p < .001$, $\eta^2 = .04$. Post-hoc analyses revealed that the referred symptomatic group had significantly higher scores on the Abandonment/Instability schema, $p < .01$, the Mistrust/Abuse schema, $p < .05$ and the Emotional Deprivation schema, $p < .01$, than the non-referred group. The referred symptomatic group had higher scores on the Defectiveness/Shame schema than both the referred non-depressed, $p < .01$, and the non-referred group, $p < .001$. The referred non-depressed group had a significantly higher score than the non-referred group only for the Emotional Deprivation schema. The results for the Disconnection/Rejection domain for the YPI-Mother are displayed in Table 3.

Paternal parenting

An overall MANOVA comparing the three groups on the domain scores of the YPI-Father revealed an overall significant effect, $F(5,71) = 4.15$, $p < .001$, again due to group differences on the Disconnection/Rejection domain, $F(2,75) = 13.90$, $p < .001$, $\eta^2 = .05$. The referred symptomatic group scored more highly than the referred non-depressed, $p < .001$ and the non-referred group, $p < .001$. No differences were found between the latter two groups, $p = .58$. As this overall MANOVA revealed no significant differences for the other paternal schema domains, these were not included in further analyses.

A MANOVA performed separately for the Disconnection/Rejection domain revealed significant differences in all constituent schemas:

Abandonment/Instability, $F(2,75) = 11.64$, $p < .001$, $\eta^2 = .05$, Mistrust/Abuse, $F(2,75) = 4.19$, $p < .05$, $\eta^2 = .02$, Emotional Deprivation, $F(2,75) = 12.20$, $p < .001$, $\eta^2 = .06$, and Defectiveness/Shame, $F(2,75) = 6.84$, $p < .01$, $\eta^2 = .04$. Post-hoc analyses demonstrated that the referred symptomatic group had significantly higher scores on the Abandonment/Instability schema than the referred non-depressed group, $p < .001$, and the non-referred group, $p < .001$. The referred symptomatic group had significantly higher scores on the Mistrust/Abuse schema than the non-referred group, $p < .05$. The referred symptomatic group had significantly higher scores on the Emotional Deprivation schema than the referred non-depressed, $p < .01$, and the non-referred group, $p < .001$. Finally, the referred symptomatic group had higher scores on the Defectiveness/Shame schema than the referred non-depressed group, $p < .05$, and the non-referred group, $p < .01$. No differences were found between the referred non-depressed and the referred group for these schemas. The results for the Disconnection/Rejection domain for the YPI-Father version are displayed in Table 4.

Discussion

Based on Young's schema theory, the present study investigated perceived parenting experiences in youngsters referred for antisocial behaviour problems. As hypothesized, the results indicated that within the referred group, a subgroup displaying comorbid depressive symptoms scored significantly more highly on the parenting practices related to Young's Disconnection/Rejection schema domain for both mother and father, compared with referred and non-referred youngsters without depressive symptoms. Apparently, children and adolescents with externalizing problems who also exhibit depressive symptomatology perceive their parents to be cold, rejecting, unpredictable, or abusive more than non-depressed controls. Generally speaking, these youngsters expect to a larger extent that their parents will not meet their need for security,

stability, empathy, acceptance and respect in a predictable manner (Young et al., 2003).

The YPI-Mother findings revealed that the antisocial youngsters with comorbid depressive symptoms experienced being treated as bad, unwanted, inferior or invalid by their mother to a greater extent than either control group. These youngsters also had higher scores on the parenting experiences related to the maladaptive schemas Abandonment/Instability, Mistrust/Abuse and Emotional Deprivation than the non-referred group. However, these parenting styles did not discriminate between referred depressed and referred non-depressed youth.

Findings for paternal parenting were even more pronounced. Apparently, depressed youth viewed their fathers as more unstable and unreliable than non-depressed controls (parenting related to the Abandonment/Instability schema). Furthermore, these youngsters reported less nurturance, empathy, or protection by their fathers (parenting related to the Emotional Deprivation schema) yet report being treated as bad, unwanted, inferior or invalid by their fathers (parenting related to the Defectiveness/Shame schema). Again, although the referred depressed group also differed from the non-referred group on the parenting practices related to the Mistrust/Abuse schema, no significant differences were found between the referred depressed group and the referred non-symptomatic group. The parenting style associated with the development of the Mistrust/Abuse schema refers to a child's experience that his/her mother or father will hurt, abuse, humiliate, cheat, lie or take advantage.

Based on present maternal and paternal findings, it seems justifiable to differentiate antisocial youngsters who exhibit depressive symptoms from those who do not, and focus specifically on the parenting practices that discriminate between these groups.

The findings regarding the parenting origin of maladaptive schemas belonging to the Disconnection/Rejection schema domain are consistent with

theoretical assumptions and empirical findings on familial risk factors associated with depression in youth and adults (Clark et al., 1999; Cole & Turner, 1993; Ingram, 2003; Shirk, Gudmundsen, & Burwell, 2005; Stark & Smith, 1995). These results can also be related to research into maladaptive schemas in adults (Calvete et al., 2005). Schmidt and colleagues (1995), for instance, found that a high score on the Beck Depression Inventory was strongly correlated with dysfunctional schemas in the Disconnection/Rejection domain.

This study extends research into parenting practices in youth. Although several studies have found evidence for an association between negative parenting and depression, they have usually focused on depressive symptoms in school samples. For example Rudolph, Hammen and Burge (1994) found that schoolchildren aged 8-12 years with elevated levels of depression showed increased negativity in beliefs about self and about family. However, in these studies, the question of specificity has not been addressed: are perceived negative parental experiences specific to depressive symptoms or are they characteristic of psychopathology in general? The present results indicate that experiences of parental rejection are not typical of all antisocial boys - only those with depressive symptomatology. We thus assume that depressed youngsters referred for antisocial behaviour problems have a complicated psychopathology and deserve specific treatment for their depression . Consequently, services for antisocial youngsters should recognize the existence of specific maladaptive parenting in a depressive subgroup and attune their interventions accordingly.

Although this study contributes to research into perceived parental experiences in depression in general and in depressive antisocial youth in particular, several limitations need to be acknowledged. First, the study was based on self-report data. Therefore, the association between depression and parenting may have been inflated because of shared method variance. This study deals only with perceived parental interactions and these perceptions may be biased by a negative information processing style – a characteristic of

depression. Although various interpersonal theories stress that lack of social support is an important risk factor in the development and maintenance of depressive disorders (Cole & Rehm, 1986; Lewinsohn et al., 1994; Puigantich et al., 1993; Sheeber & Sorensen, 1998), perceived social interactions may not accurately reflect reality. Therefore, future research should also include a set of external evaluations or criteria to weigh against subjective experiences. Nevertheless, in the context of depression, the appraisal of events is crucial in activating cognitive processes that trigger depressive feelings (Clark et al., 1999).

Second, the current study is also limited in terms of its generalizability. The referred group consisted of court-referred youngsters with severe externalizing problems. Comparison of the referred youngsters with and without depressive symptoms justifies the conclusion that the identified maladaptive parenting practices are due to the comorbid depressive condition rather than only to externalizing problems or to referral status. Although in line with former research on depression, it is not clear to what extent these findings can be generalized to purely depressed referred youngsters.

Next, the study is hampered by its small sample size, which raises questions about statistical power. In particular, the referred symptomatic group consisted of only 13 youngsters. However, exploratory research of this kind remains important - it sets the stage. It is remarkable that even in this small sample about one third of the referred group met the criteria for depressive symptoms, which indicates the importance and relevance of studying this comorbidity.

More controlled studies with larger samples will enable to examine age and gender differences in the parenting origins of maladaptive schemas. In this study, the depressed sample contained more boys than girls and may therefore not be totally representative of depressive symptomatology as it appears in girls with externalizing problems. Previous research has demonstrated greater

cognitive vulnerability to depression in girls (Hankin & Abramson, 2001) and therefore it seems especially relevant to explore gender effects in the context of perceived parenting. Because of the small number of girls in the three groups here, we considered it inappropriate to conduct such analyses on the present data.

Finally, future research will need to use longitudinal designs to gain insight into the mechanisms through which perceptions of parental rejection may be related to depression, and how the comorbidity with antisocial behaviour must be understood.

One could remark that in the referred group not all children and adolescents fully met the criteria for a psychiatric mood disorder as diagnosed by the clinical interview. However, undiagnosed individuals with subtreshold symptoms can also be severely impaired (Angold, Costello, Farmer et al., 1999). As youngsters with a diagnosis of depression are usually referred to a psychiatric unit, in court-referred youth, the presence of subclinical depressive problems is more likely than full blown depression. Therefore, it seemed reasonable to use the CDI as a screening tool when assessing children and adolescents with antisocial behaviour. In this regard, the present study draws attention to comorbid depressive symptoms that often remain undiagnosed and therefore unaddressed. Specifically, maladaptive parenting practices that characterise this comorbid group, were highlighted.

This study stresses the importance of adverse parental experiences in depressed youngsters with antisocial behaviour; treatment for these children and adolescents should be multi-faceted and include family intervention in addition to interventions directed at the child (Stark & Smith, 1995). This study also lends support to the idea of re-installing constructive social networks to counter negative interpersonal perceptions.

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Tables

Table 1. *Dysfunctional schemas and schema domainsas outlined by Young(Young et al., 2003), description of typical family of origin of people endorsing these and exemplary YPI-items*

SCHEMAS/DOMAINS	DESCRIPTION	FAMILIAL ORIGIN	EXEMPLARY YPI-ITEM
Disconnection/Rejection	*Expectation that one's needs for security, safety, stability, nurturance, empathy, sharing of feelings, acceptance and respect will not be met in a predictable manner.*	*Detached, cold, rejecting, withholding, lonely, explosive, unpredictable or abusive*	
Abandonment/Instability	The perceived instability or unreliability of those available for support and connection.		'My mother/father withdraws or leaves me alone for extended periods'
Mistrust/Abuse	The expectation that others will hurt, abuse, humiliate, cheat, lie, manipulate or take advantage.	'	'My mother/father lies to me, deceives me or betrays me'
Emotional Deprivation	The expectation that one's desire for a normal degree of emotional support will not be adequately met by others.		'My mother/father spends time with me and pays attention to me'
Defectiveness/Shame	The feeling that one is defective, bad, unwanted, inferior or invalid in important respects or that one would be unlovable to significant others if exposed.		'My mother/father makes me feel ashamed of myself in important aspects'
Impaired Autonomy/Performance	*Expectations about oneself and the environment that interfere with one's perceived ability to separate, survive, function independently or perform successfully.*	*Enmeshed, undermining of child's confidence, overprotective or failing to reinforce the child for performing competently outside the family*	
Dependence/Incompetence	The belief that one is unable to handle one's		'My mother/father treats me as if I

	everyday responsibilities in a competent manner without considerable help from others.		am younger than I really am'
Vulnerability to Harm/Illness	Exaggerated fear that imminent catastrophe will strike at any time and that one will be unable to prevent it.		'My mother/father worries excessively that I will get sick'
Enmeshment/Undeveloped Self	Excessive emotional involvement and closeness with one or more significant others (often parents) at the expense of full individuation or normal social development.		'My mother/father and me, we are so close that we understand each other almost perfectly'
Failure	The belief that one has failed, will inevitably fail or is fundamentally inadequate relative to one's peers in areas of achievement.		'My mother/father expect me to be a failure in life'
Impaired Limits	*Deficiency in internal limits, responsibility to others or long-term goal orientation; leads to difficulty respecting the rights of others, cooperating with others, making commitments or setting and meeting realistic personal goals.*	*Characterized by permissiveness, overindulgence, lack of direction or a sense of superiority rather than appropriate confrontation, discipline and limits in relation to taking responsibility, cooperating in a reciprocal manner and setting goals*	
Entitlement/Grandiosity	The belief that one is superior to other people, entitled to special rights and privileges or not bound by the rules of reciprocity that guide normal social interaction.		'My mother/father make me feel special, better than most other people'
Insufficiënt Self-Control	Pervasive difficulty or refusal to exercise sufficient self-control and frustration tolerance to achieve one's personal goals or to restrain the expression of one's emotions and impulses.		'My mother/father set few rules or responsibilities for me'

Other-Directedness	*An excessive focus on the desires, feelings and responses of others at the expense of one's own needs in order to gain love and approval, maintain one's sense of connection or avoid retaliation.*	*Based on conditional acceptance: children must suppress important aspects of themselves in order to gain love, attention and approval; parents' emotional needs and desires (or social acceptance and status) are valued more than the unique needs and feelings of each child*	
Subjugation	Excessive surrendering of control to others because one feels coerced submitting in order to avoid anger, retaliation or abandonment.		'My mother/father treats me as if my opinions or desires don't count'
Self-Sacrifice	Excessive focus on voluntarily meeting the needs of others in daily situations at the expense of one's own gratification.		'My mother/father is unhappy a lot and relies on me for support and understanding'
Approval-Seeking	Excessive emphasis on gaining approval, recognition or attention from other people or on fitting in at the expense of developing a secure and true sense of self.		'My mother/father is concerned with social status and appearance'
Overvigilance/Inhibition	*Excessive emphasis on suppressing one's spontaneous feelings, impulses and choices or on meeting rigid, internalized rules and expectations about performance and ethical behaviour, often at the expense of happiness, self-expression, relaxation, close relationships or health.*	*Grim, demanding and sometimes punitive: performance, duty, perfectionism, following rules, hiding emotions and avoiding mistakes predominate over pleasure, joy and relaxation; usually an undercurrent of pessimism and worry that things could fall apart if one fails to be vigilant and careful at all times*	
Negativity/Pessimism	A pervasive, lifelong focus on the negative aspects of life while minimizing or		'My mother/father has a pessimistic outlook; often expects

	neglecting the positive aspects.	the worst outcome'
Emotional Inhibition	The excessive inhibition of spontaneous action, feeling or communication, usually to avoid disapproval by others, feelings of shame or losing control of one's impulses.	'My mother/father is private, rarely discusses his/her feelings'
Unrelenting Standards	The belief that one must strive to meet very high internalized standards of behavior and performance, usually to avoid criticism.	'My mother/father expects me to do my best at all times'
Puntiveness	The belief that people should be harshly punished for making mistakes.	'My mother/father becomes angry or harshly critical when I do something wrong'.

Table 2. *Group Characteristics*

	Referred symptomatic (n = 13)		Referred non-depressed (n = 28)		Non-referred non-depressed (n = 41)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Age	14.00	2.74	12.43	2.47	12.27	2.12
CDI	15.54	3.97	6.46	3.51	6.56	3.56

Note. CDI = Children's Depression Inventory

Table 3. *Means and standard deviations for maternal parenting related to schemas of the the Disconnection/Rejection Domain*

	Referred symptomatic (n = 13) *M (SD)*	Referred non-depressed (n = 28) *M (SD)*	Non-referred non-depressed (n = 41) *M (SD)*
Disconnection/Rejection	2.47 (1.20) ab	1.82 (0.78) a	1.49 (0.43) b
- Abandonment/Instability	2.19 (1.30)a	1.62 (0.93)	1.33 (0.38)a
- Mistrust/Abuse	1.98 (1.22)a	1.48 (0.93)	1.27 (0.44)a
- Emotional Deprivation	2.92 (1.34)a	2.53 (1.24)b	1.83 (0.64)ab
- Defectiveness/Shame	2.79 (1.80)ab	1.63 (0.80)a	1.51 (0.67)b

Note. Values with the same superscript letters differ significantly (p < .05) from each other.

Table 4. *Means and standard deviations for paternal parenting related to schemas of the the Disconnection/Rejection Domain*

	Referred symptomatic (n = 11) M (SD)	Referred non-depressed (n = 26) M (SD)	Non-referred non-depressed (n= 41) M (SD)
Disconnection/Rejection	2.85 (1.22)$_{ab}$	1.75 (.77)$_a$	1.57 (.48)$_b$
- Abandonment/Instability	2.66 (1.10)$_{ab}$	1.57 (.77)$_a$	1.46 (.60)$_b$
- Mistrust/Abuse	2.02 (1.51)$_a$	1.40 (.70)	1.28 (.43)$_a$
- Emotional Deprivation	4.07 (1.73)$_{ab}$	2.42 (1.37)$_a$	2.09 (.83)$_b$
- Defectiveness/Shame	2.66 (1.58)$_{ab}$	1.62 (1.13)$_a$	1.43 (.61)$_b$

Note. Values with the same superscript letters differ significantly (p < .05) from each other.

Chapter 8

General Discussion

This chapter discusses the main findings of the different empirical studies and situates them within a general developmental psychopathology model. Furthermore, limitations and clinical implications are addressed. Finally, two promising future research directions are outlined in depth.

Research overview in a nutshell

        In chapter 1, we set off by introducing developmental psychopathology: a fairly young discipline that has been created specifically to study emotional and behavioural problems in youth from a developmental perspective (Braet & van Aken, 2006; Masten, 2006). We immediately also addressed two delicate issues in child and adolescent psychopathology research. The first challenge is linked to the debate on how to define and assess psychopathology. We will return to this aspect in the present chapter's section that discusses the strengths and limitations of the empirical studies in this thesis. The second challenge concerns the search for a good psychopathology model: it remains to be tested which framework is most appropriate to understand emotional and behavioural problems in children and adolescents. In this regard, **the central research aim of the present dissertation was to test the utility of the cognitive model in general and Young's schema theory in particular to conceptualize psychopathology in adolescents**.

        The cognitive model postulates that maladaptive schemas are at the bottom of development and maintenance of emotional problems (A. T. Beck, 1976; J. S. Beck, 1995). Dysfunctional schemas are presumed to develop during childhood and adolescence. In later life, they make people vulnerable to develop psychological problems in confrontation with stress, which is referred to as cognitive theory's diathesis-stress hypothesis (Clark, Beck, & Alford, 1999). Hence, maladaptive schemas are also denoted as 'cognitive vulnerability'. It is furthermore assumed that each type of emotional disturbance can be discriminated on the basis of a unique cognitive content (A. T. Beck, 1976), which is referred to as cognitive theory's cognitive-content specificity hypothesis. Young's schema theory (Young, Klosko, & Weishaar, 2003), which further elaborates on Beck's original ideas, provides us with a diversified operationalization of the schema concept and served as the connecting thread

throughout the dissertation. Young developed a self-report measure to assess schemas, i.e., the Young Schema Questionnaire (YSQ: Young & Brown, 1990), which constituted the central instrument of the thesis.

Research on maladaptive schemas in children and adolescents has lagged far behind that in adults. Most cognitive models and their accompanying measurement instruments were originally developed for adults and have subsequently been used in children and adolescents. Young's schema theory constitutes no exception to that. Whereas Young's schema taxonomy inspired many empirical studies in adult samples, only four studies in adolescents were reported so far (Cooper, Rose, & Turner, 2005; Lumley & Harkness, 2007; Muris, 2006; H. M. Turner, Rose, & Cooper, 2005). However, from a developmental psychopathology perspective, the importance of studying vulnerability factors in younger populations cannot be overstated. Evaluating the utility of the existing cognitive psychopathology models for youngsters first of all involves an appraisal of the developmental appropriateness, reliability and validity of the utilized measurement instruments in children and adolescents. Secondly, the tenability of the model's main theoretical assumptions in youth needs to be tested. Therefore **the central aim of the dissertation concretely broke up into (1) a thorough psychometric evaluation of the YSQ and (2) an investigation of the presence of schemas in youth and their (content-specific) association with psychopathology**.

Throughout the dissertation, high internal consistency levels were found for the YSQ schema and schema domain subscales (chapter 4, 5, 6). The first (15 schemas) and second order (five schema domains) factor structure of the YSQ were supported (chapter 6). Further, the presence of maladaptive schemas in youngsters suffering from psychopathology was demonstrated (chapter 4, 5, 6). Evidence was also found for a significantly positive association of Young's maladaptive schemas on the one hand and psychological problems on the other hand, irrespective of whether a categorical (chapter 4, 6) or a dimensional 'broad

band' (chapter 5, 6) or 'small band' (chapter 4, 6) assessment of psychopathology was involved. It was shown that cognitive vulnerability explains a substantial amount of variance in psychopathology (chapter 5, 6). Further, the tenability of the cognitive content-specificity hypothesis was demonstrated (chapter 6, 7). These results confirm the utility of Young's model to conceptualize psychopathology in adolescents.

Part of this dissertation focused on cognitive vulnerability in a specific subgroup of youngsters with psychological problems, i.e., obese children and adolescents. To this end, chapter 2 and chapter 3 set the stage by attempting to provide a better understanding of psychosocial comorbidity in childhood and adolescent obesity and its possible implications for obesity treatment. The studies reported on in chapter 2 and 3 did not address cognitive vulnerability per se. Nevertheless, as outlined in chapter 1, we considered them essential to deal with some shortcomings in the existing literature on psychopathology in (treatment of) obese youth. Also, we wanted to provide the reader with a well-defined profile of who we considered, on the basis of earlier literature in the field, most vulnerable for comorbid psychopathology, i.e., *referred* obese youngsters. However, both in chapter 2 and 3, some of our main hypotheses were largely disconfirmed. In chapter 2, non-referred obese children and adolescents proved not to be all that different from referred obese youngsters regarding psychological symptoms and mental disorders. In the referred as well as in the non-referred group, a substantial proportion of obese youngsters fulfilled criteria for at least one mental disorder. In chapter 3, it was shown that mental disorders complicate obesity treatment, but only 'halfway' treatment: the presence of a psychiatric diagnosis was not predictive for weight loss, neither at a very early stage, nor at the end of treatment. However, in line with our hypotheses it was shown that a substantial proportion of obese youngsters still fulfilled criteria for a psychiatric diagnosis after treatment.

Nevertheless, the more or less unexpected results of the studies reported in chapter 2 and 3 do not alter anything to our main starting point, outlined in chapter 1, that the childhood and adolescent obesity field is in need of a comprehensive psychopathology model to guide research on and management of emotional and behavioural problems in obese youth[1]. In this regard, chapter 4 and chapter 5 presented two exploratory studies in which Young's theory was pushed forward as a candidate framework. In chapter 4, it was demonstrated that referred and non-referred obese youngsters who report eating disorder symptoms (loss of control over eating) exhibit more severe dysfunctional schemas as compared with obese youngsters who do not suffer from loss of control over eating. Moreover, in the whole sample of obese adolescents, an association was found between maladaptive schemas on the one hand and the cognitive correlates of eating disorders (dietary restraint attitudes, eating, weight and shape concern) and depressive symptoms on the other hand. In chapter 5 it was shown that referred obese adolescents, who exhibited more severe internalizing and externalizing problem behaviour as compared with normal weight controls, also displayed a higher level of maladaptive schemas. All these findings are in conformity with cognitive theory's predictions. Hence, Young's framework also stood his preliminary test in obese youth.

In conclusion, the findings of the present dissertation altogether suggest the adequacy of the cognitive model in general and Young's

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[1] One could raise that, due to the findings on weight loss in chapter 3, the argument that clinicians need a psychopathology model guiding psychotherapeutic interventions during obesity treatment, is turned invalid. In this regard however, Jelelian and Saelens (1999) notified that an evaluation of obesity treatment cannot rely solely on weight loss but should also include psychological variables. Given the findings in chapter 3 on post-treatment psychopathology, it is reasonable to state that a substantial amount of the participants still displayed suffering at the end of treatment and that their concerns should have been addressed more adequately. Moreover, as mentioned in chapter 3 and as discussed in more detail at the end of the present chapter, we could presume that psychopathology has predictive value for drop-out. Further research is needed to investigate this.

cognitive model in particular to understand psychopathology in (obese) adolescents. As outlined in chapter 1, Beck has always remained vague on the origin of schemas, whereas Young concretely postulated a (content-specific) association between maladaptive parenting practices on the one hand and dysfunctional schemas on the other hand. In chapter 7, we investigated the parenting origins of maladaptive schemas and demonstrated their specific association with depression. Hence, from a developmental psychopathology point of view, Young's schema theory clearly adds to Beck's traditional cognitive model. However, we would venture to say that even Young's (adult) theory might not be dynamic enough to provide a good understanding of the *developmental aspects* of cognitive vulnerability and psychopathology in youth. To instigate the formulation of a more dynamic model, we will now turn to a general developmental psychopathology framework to re-examine the dissertation's findings.

The main research findings within a general developmental psychopathology framework

We choose a model that was recently proposed by Grant and colleagues (2003) to understand the role of stressors in the etiology of child and adolescent psychopathology. One might argue that the focus of the present dissertation was on vulnerability and not on stress. Indeed, as will become clear, only in chapter 7, a stress measure (i.e., on adverse parenting) was included. However, it cannot be denied that the stress notion runs through the dissertation and that a precise mutual situation of the concepts of stress, cognitive vulnerability and psychopathology would be welcome. The model of Grant and colleagues was chosen for several reasons. First of all, Grant et al. (2003) focus explicitly on diatheses or vulnerability factors and hence on the *mechanisms through which* psychopathology might arise, which is particularly interesting from a developmental psychopathology perspective. Secondly, the model is specifically

designed to be a starting block for conducting *theory-based research* on these mechanisms (Grant et al., 2003). To serve as a basis for research, the model must be disaggregated in one of the many mechanisms it comprises. Grant and colleagues (2003; 2006) denounce the lack of theory-driven research on mediators and moderators in the association of stress and psychopathology in children and adolescents. According to these authors, the moderator studies on stress and depression that were conducted within the cognitive framework so far, provide some of the best examples of theory-driven moderation research (Grant et al., 2006).

A schematic representation of the model is depicted in Figure 1. The model includes five central propositions. The first is that stressors lead to psychopathology, which obviously is the overall rationale to conduct research on stress and psychopathology in children and adolescents. Longitudinal studies empirically support the idea that stressors predict psychological problems in youth (Grant, Compas, Thurm, McMahon, & Gipson, 2004). The second proposition of the conceptual model is that moderators influence the relation between stressors and psychopathology. The third proposition is that mediators explain the relation between stressors and psychopathology. The fourth proposition is that there is specificity in the relations among stressors, moderators, mediators and psychopathology. Finally, the fifth proposition is that relations among stressors, moderators, mediators and psychopathology are reciprocal and dynamic.

In the next paragraph of this section, cognitive vulnerability will be discussed in light of the second, the third and the fifth proposition of the model and the stress concept will be defined and situated. We will return to the ideas outlined in the latter paragraph when proposing some interesting future research directions. Next, we will re-examine the findings of chapter 6 and 7 on the basis of the model's fourth proposition. The final paragraph in this section focuses

explicitly on stress, cognitive vulnerability and psychopathology in *obese* youth and hence on the findings of chapters 2, 3, 4 and 5.

Moderators, mediators and their reciprocal and dynamic interrelations with each other, with stressors, with development and with psychopathology

Baron and Kenny (1986) defined a moderator as a qualitative or quantitative variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable. In the present context, moderators may be conceptualized as diatheses, as they represent preexisting characteristics (i.e., in existence prior to exposure to the stressor) that increase the likelihood that stressors will lead to psychopathology (Grant et al., 2003). According to Baron and Kenny (1986), a given variable may be said to function as a mediator to the extent that it accounts for the relation between the predictor and the criterion variable.

First of all, should we consider maladaptive schemas as mediators or as moderators in the association of stress and psychopathology? At first glance, one might notice some inconsistencies in cognitive theory's assumptions on this matter. As mentioned, cognitive theory considers *cognitive vulnerability as a moderator* in the association of current stressors and psychopathology (Clark et al., 1999). Although he does not discuss this aspect in much detail, Young acknowledges cognitive theory's diathesis-stress component, as he states that *current* life-experiences, which adults *perceive* as similar to the traumatic experiences of their childhood, activate preexisting maladaptive schemas, leading to very intense negative emotions. When Young discusses the dimensionality of the schema concept, he also refers to cognitive theory's diathesis-stress component: the more severe the schema, the greater the number of situations that activate it. However, the status of cognitive vulnerability in childhood and adolescence is less clear-cut. Whereas traditional cognitive theory vaguely points at childhood experiences to explain the origin of maladaptive

schemas, Young concretely postulates that, during childhood and adolescence, maladaptive schemas are *reality-based* representations, constructed on the basis of the child's current dysfunctional environment. Hence, it is assumed that the child or adolescent *develops maladaptive schemas in response to his/her adverse environment*, which is the exact description of *a mediator* (Grant et al., 2003). In conclusion, it is not contradictory to postulate that a moderator model in adults is a mediator model in youth and that during childhood and adolescence, maladaptive schemas should be considered mediators rather than moderators.

How can the model of Grant and colleagues (2003) deal with a variable that changes its status during development? The fifth proposition model is relevant in this aspect. This postulate encompasses, among other things, that, given the reciprocal and dynamic relations among stressors, moderators and mediators, the role of specific variables within the model may shift over time. The authors exemplify this as follows (p. 453): 'a mediator that developed in response to a particular stressor, may become a fixed pattern of responding and thus interact as a moderator with subsequent stressors'. This is exactly the perspective we adopt on how maladaptive schemas originate and evolve in childhood and adolescence. Young did not include such developmental aspects in his theory and consequently, he describes things rather static. He states that during childhood and adolescence schemas originate (and should be considered mediators) whereas in adulthood they interact with current stressors to develop psychopathology (and should be considered moderators). Given that Young's schema theory is an adult model, this is not all that surprising. However, we are of the opinion that Young's model could be refined considerably on this matter by incorporating the developmental processes of cognitive vulnerability *during* childhood and adolescence, until adulthood is reached. We will shortly come back to this issue when outlining some interesting future research directions.

Secondly, should we consider the adverse parenting experiences early in life, as described in chapter 1 and chapter 7, as stressors, as mediators or as

moderators? For the sake of clarity, we firstly deal with what is understood by a stressor. Grant et al. (2003) define stress in the following way (p. 449): 'Environmental events or chronic conditions that objectively threaten the physical and/or psychological health or well-being of individuals of a particular age in a particular society'. Regardless of this working definition of stressors, the authors admit that much additional research is needed to determine which specific environmental changes, events and situations are 'objectively threatening' to children and adolescents. Grant, Compas, Thurm, McMahon and Gipson (2004) demonstrated that very few studies in youngsters have operationalized stressors by using comparable measures. Therefore, Grant and colleagues (2003) suggest the development of a taxonomy of stressors similar to the dimensional assessment approach of child and adolescent psychopathology (Achenbach & Rescorla, 2001). Nevertheless, the authors indicate that stressful experiences in youth refer to acute traumatic events (e.g.: natural and human disasters, sexual and physical abuse), chronic strain and adversity (e.g.: poverty, economic hardship, personal or parental chronic illness, chronic maltreatment or neglect) and the accumulation of stressful life-events and daily hassles, including both normative experiences of development (e.g.: transition to high school) as well as non-normative events (e.g. death of a family member) and chronic stressors (e.g. excessive noise in a low-income neighborhood).

Given this definition and the examples provided, it seems quite obvious to consider the adverse parenting experiences early in life, as described in chapter 1 and chapter 7, as stressors. As discussed in chapter 1, Young developed a questionnaire to assess adverse parenting experiences during childhood and adolescence, i.e. the Young Parenting Inventory (YPI: Young, 1994). As outlined in chapter 7, we adapted the YPI for use in youngsters by, among other things, formulating the items in the present and not in the past tense as is the case for the adult instrument. Hence, the YPI as used in chapter 7 actually measures *current interpersonal stress* (Grant et al., 2006), i.e., in

relation to one or both of the parents, as perceived by the child or adolescent. The findings in chapter 7 evidence an overall association of current ongoing (familial) stress and psychopathology, which confirms one of cognitive theory's main assumptions.

However, it is a little confusing that many of the adverse parental experiences as measured with the YPI, remind us of what is generally referred to as 'parenting practices'[2]. For example, the parental experiences related to the development of the Punitiveness schema as measured with the YPI, strongly resemble what is called '(harsh) punishment' in the parenting literature, the YPI parenting style associated with the Vulnerability to Harm/Illness schema resembles what is called 'parental overprotection' and the YPI parenting practices related to schemas in the first domain closely resemble the concept of 'parental rejection'. When browsing through the literature on stress and child and adolescent psychopathology, one will notice that parenting practices are often categorized as (family-based) *mediators* (see e.g.: Dodge, Pettit, & Bates, 1994; Wills, McNamara, & Vaccaro, 1995) and not as stressors. The study by Decaluwé, Braet, Moens and Van Vlierberghe (2006) in obese youngsters mentioned in the introduction is in this regard a typical example. Grant and colleagues (2006) clarify this ambiguity by explaining that in the stress and psychopathology literature in youth, mediator research is based on two broad theoretical models, i.e., interpersonal theory (Hammen & Rudolph, 1996) and cognitive theory. Studies within the framework of interpersonal theory generally focused on testing family-based mediators (e.g.: parenting experiences, family processes, parent-child relationships) whereas studies within the cognitive framework focused on child-based mediators (i.e., cognitive vulnerability). In both research traditions, familial *stressors* refer to low SES, parental divorce/marital conflict, abuse and parental illness. Apparently, the cognitive

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[2]   Throughout the thesis and especially in chapter 7, we actually also referred to these
      parental characteristics as 'parenting experiences' or 'parenting practices'.

research tradition in youth has never broadened the familial stress component to for example parenting practices or parental rejection[3]. This might possibly be due to the fact that cognitive theory always remained vague on the familial origins of maladaptive schemas. However, Young's schema theory creates an excellent opportunity to do so in future research.

Finally, from a developmental psychopathology perspective, it is somewhat disappointing that Young mainly confined his ideas on the origin of schemas to early parenting experiences. Certainly in adolescents, one might presume other significant stressors, such as peer rejection or life-events, to be at play. In future research, it would be interesting to investigate (content-specificity in) the association of social experiences and recently experienced life-events, maladaptive schemas and psychopathology in adolescents. In this regard, we would like to mention that in chapter 6, the participants of study 2 and their parents also completed measures of current parental rejection, negative life-events and peer rejection. Although not reported in the present dissertation, nearly all correlations between composite stress scores, schema domain scores and composite scores on the DSM-oriented scales were significantly positive (Van Vlierberghe, Braet, & Bosmans, in preparation). These results confirm cognitive theory's assumption on the association of current stress, schemas and psychopathology and point at the relevance of including other than familial stressors.

Specificity relations between stressors, moderators, mediators and psychopathology

According to the fourth proposition, a particular type of stressor is linked with a particular type of psychological problems via a particular mediating

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[3]   The research of Cole and colleagues on the mediating role of self-perceived feedback in the association of parental competency related feedback and depression (see e.g.: Jacquez, Cole, & Searle, 2004) is an in this regard noteworthy exception.

process in the context of a particular moderating variable (Grant et al., 2003). Very few studies have tested such 'full specificity designs': most research was conducted on the association of specific stressors with specific forms of psychopathology and the stressors investigated mainly concerned the familial stressors outlined above, i.e., abuse, divorce/marital conflict etc. (McMahon, Grant, Compas, Thurm, & Ey, 2003). Overall, studies that have tested for specificity conducted in the past, found little evidence for specificity. Obviously, the fourth proposition brings us with the issue of content-specificity, which was addressed in chapters 6 and 7.

As outlined in chapter 1, Young does *not* presume specificity in the association of maladaptive schemas and psychopathology, which is in contrast with cognitive theory's 'traditional' content-specificity hypothesis. Young considers psychopathology within the context of coping styles, which are person-specific and *can* be schema-specific, i.e., *within* an individual (Young et al., 2003). In chapter 6, we nevertheless formulated, on the basis of the 'classic' ideas on content-specificity (A. T. Beck, 1976; A. T. Beck, Emery, & Greenberg, 1985; Clark et al., 1999), some hypotheses on how Young's schema taxonomy might relate to specific forms of psychopathology in youth. Methodologically, it was argued that it might be better to use schema domains and not individual schema subscales as predictors. We hypothesized that predominantly the Disconnection/Rejection schema domain would be associated with (symptoms of) depression, that especially the Impaired Autonomy/Performance schema domain would be related to anxiety (symptoms) and that particularly the Impaired Limits schema domain would be related to oppositional defiant disorder and conduct disorder (symptoms). As schema domains appeared largely correlated, there was, for each form of psychopathology, a serious proportion of explained variance that was shared by all schema domains. Nevertheless, as outlined in more detail in the discussion of chapter 6, our hypotheses on content-specificity were generally confirmed.

In this regard, another interesting finding of the present dissertation is that Young's schema taxonomy seems more strongly associated with internalizing than with externalizing problem behaviour. For example, in chapter 5, the maladaptive schemas outlined by Young altogether accounted for about 45% of the variation in internalizing versus 19% of the variation in externalizing symptomatology. In chapter 6, schema domains accounted for about 23% of the variation in depressive symptoms, 25% of the variance in anxiety symptoms, but only 9% of the variation in oppositional defiant disorder symptoms and 10% of the variance in conduct disorder symptoms.

As outlined in chapter 1, Young presumes content-specificity in the association of specific childhood stressors (early parenting experiences) and the formation of specific maladaptive schemas. In the present dissertation, this hypothesis was not investigated, but it would be interesting to do so in the future. To the best of our knowledge, one study in adults has addressed this issue within Young's cognitive framework. Sheffield, Waller, Emanuelli, Murray and Meyer (2005) administered both the YPI and the YSQ to a non-referred sample of 422 students. Although the main aim of their study was to evaluate the psychometric qualities of the YPI, the authors also calculated correlations between the YSQ and the YPI schema subscales. Overall, clinically meaningful correlations were found, which confirms the hypothesis that negative early parenting experiences are associated with the presence of maladaptive schemas. However, less support was found for the content-specificity Young assumed in this regard. It was for example not the case that the YSQ Emotional Deprivation schema only correlated significantly with the YPI Emotional Deprivation subscale. In fact, some YSQ schemas did not correlate significantly with their YPI counterpart. These results are however not all that surprising, given the high intercorrelation of schemas[4]. As discussed in chapter 6, it might be more interesting to use YSQ

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[4]   Although not reported in chapter 7, we also calculated intercorrelations between parenting practices as measured with the YPI. Many YPI subscales intercorrelated

and (maybe also YPI) domain scores instead of the schema subscales. Methodologically, it will nevertheless remain challenging to deal with the fact that schema domains also tend to intercorrelate highly. Theoretically and clinically however, the relevance of investigating content specificity cannot be overstated. Hence, it would be very interesting to conduct a study similar to the one by Sheffield et al. (2005) in adolescents also.

In chapter 7, we actually investigated content-specificity in the association of specific parenting experiences and depressive symptoms. Hence, theoretically this chapter included an alternative test of cognitive theory's content-specificity hypothesis. However, the study was also of particular clinical relevance since it focused on a specific subgroup of youngsters, i.e., children and adolescents referred for disruptive behaviour problems, suffering from comorbid depressive symptomatology. We departed from the hypothesis that especially the Disconnection/Rejection domain is related to depressive symptomatology. In chapter 6, this was confirmed for maladaptive schemas, on the basis of the YSQ. In chapter 7, we wanted to investigate whether this also holds for parenting experiences, on the basis of the YPI. Overall, our hypothesis was confirmed. Referred antisocial youngsters who also demonstrate depressive symptoms perceive their parents as more cold, instable, unreliable and unpredictable than do non-depressed controls. Given the content-specificity hypothesis on disruptive behaviour outlined above, one might have expected the group referred for antisocial behaviour (both depressed and non-depressed) to score significantly higher on the YPI Impaired Limits domain as compared with the non-referred controls. However, no such difference could be established. As discussed in chapter 6, it could be hypothesized that youngsters suffering from oppositional defiant disorder are to be discriminated from those suffering from

highly, but some did not and there were even a few negatively significant correlations between parenting experiences. Hence, the YPI seems to show a more diversified pattern on the level of the individual subscales as compared with the YSQ. Future research should explore this in depth.

conduct disorder as regards cognitive content and hence, maybe also with respect to perceived parenting experiences.

Towards a broader understanding of psychopathology in obese children and adolescents

In the present paragraph, the issue of psychopathology in childhood and adolescent obesity is discussed in detail on the basis of the proposed conceptual model, integrating the present dissertation's findings on this matter.

Understanding the findings in chapter 2 and chapter 3

First, we shortly repeat the results of chapter 2. A substantial percentage of obese children and adolescents displays psychological problems. Therefore, although obesity is considered a medical condition, a psychological perspective seems also indicated to understand suffering in obese individuals. The psychopathology differences between referred and non-referred obese individuals established in earlier studies (Braet, Mervielde, & Vandereycken, 1997; Britz et al., 2000; Erermis et al., 2004; Fitzgibbon, Stolley, & Kirschenbaum, 1993) used to be explained by what we referred to as the 'stigma hypothesis'. However, the results of the study presented in chapter 2 forced us to look for alternative explanations. We pushed forward the 'spirit of the times hypothesis'[5]. We postulated that, due to the tremendous amount of attention that has recently been paid to obesity, and due to the emphasis on the individual's responsibility for attaining a healthy life-style, obesity *in itself* and not only the social stigmatization and/or the associated comorbidity brings along suffering, and is hence reason enough for obese people to seek treatment. Consequently, differences between referred and non-referred groups will become less marked. A comparison of the CBCL-findings in chapter 2 with those in the study by

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[5]   Note that the 'spirit of the times' hypothesis provides us with an explanation of referral and not of psychopathology in obese youth.

Braet and colleagues (1997) showed a general increase in psychological symptoms in obese youth during the past decade. This confirms the necessity of adopting a psychological framework and brings us to a central question: which mechanisms are involved here?

We started our search for a suitable psychological perspective with a literature review on psychological aspects other than symptoms and disorders associated with obesity in children and adolescents. In this regard, four cross-sectional studies were presented in chapter 1 that demonstrate how dysfunctional familial characteristics relate to psychological problems within groups of (referred) obese youngsters (Decaluwe et al., 2006; Epstein, Klein, & Wisniewski, 1994; Epstein, Myers, & Anderson, 1996; Zeller, Saelens, Roehrig, Kirk, & Daniels, 2004). On the basis of these results, it was argued that the field is in need of a broader conceptualization of influences on psychopathology in childhood and adolescent obesity. A comprehensive framework which enables us to understand and treat emotional problems in obese youngsters seems warranted. The 'spirit of the times' hypothesis is however not very helpful in this respect since it cannot explain why familial adversity should be related to psychopathology in obese youngsters. A comprehensive model should include both observations as well as assumptions about how they are related.

It is probably most compelling to explain the findings in chapter 2 by considering psychological problems in obese youth as a *consequence* of being obese. This view is often confirmed in obese individuals' retrospective recalls (see e.g.: Britz et al., 2000). There is clear evidence that obese youngsters and adults are stigmatized and discriminated. This was illustrated in the sixties already in two historical experiments (Richardson, Goodman, Hastorf, & Dornbusch, 1961; Staffieri, 1967). In an extensive review on this matter, Puhl and Latner (2007) documented pervasive stereotyping, bias, rejection and prejudice toward overweight youngsters, showing in e.g. verbal teasing, physical bullying and/or relational victimization by peers as well as by educators and

parents. In an earlier review, Puhl and Brownell (2001) demonstrated how this stigmatization process continues in adulthood. Obese individuals have more difficulties finding a job, they are paid less and their promotion prospects are dimmer. Further, very negative attitudes towards overweight individuals have been demonstrated in health care professionals, which makes obese individuals reluctant to seek medical care. Research suggests that attributions about the causes of obesity play an important role in expressions of weight bias: many stereotypes about overweight individuals emphasize that people are obese because they lack self-discipline and willpower, or because they are lazy, unmotivated or self-indulgent[6] (Puhl & Latner, 2007).

The *mechanism* through which social stigmatization leads to psychopathology in obese individuals is often described on the basis of theories on the development of self-esteem. According to developmental psychologist Harter (1983), children and adolescents internalize the social feedback they receive into a concept of self. A negative self-concept is a risk factor for a variety of psychological problems. Since the literature on self-esteem in obese individuals reveals many inconsistencies (see: Friedman & Brownell, 1995; Puhl & Latner, 2007), it was argued that the use of a multidimensional concept of self-esteem (Harter, 1983) would be more appropriate. In this regard, a more or less consistently replicated finding is that obese children and adolescents have a more negative body image than their peers (Zametkin, Zoon, Klein, & Munson, 2004). This can explain the association of obesity and dieting in youth (Stice, 2002). Some studies indicate that other components of self-perception related to overweight and social interactions are also affected (e.g.: athletic competence, social acceptance) (Kimm, Sweeney, Janosky, & Macmillan, 1991; Moens, Braet, & Timbremont, 2005; Phillips & Hill, 1998). In the aforementioned study

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[6]   The latter findings corroborate the ideas of the 'spirit of the times' hypothesis.

by Braet and colleagues (1997), obese youngsters in addition also displayed lower scores on a global self-esteem subscale.

However again, the well-established social stigmatization of obese individuals (Puhl & Brownell, 2001; Puhl & Latner, 2007) and the low levels of obesity-related aspects of self-esteem (Kimm et al., 1991; Moens et al., 2005; Phillips & Hill, 1998; Zametkin et al., 2004) cannot account for the fact that familial adversity is so strongly related to psychopathology in obese youth (Decaluwe et al., 2006; Epstein et al., 1994; Epstein et al., 1996; Zeller, Saelens et al., 2004). Hence, the comprehensive model we aim at should be able to provide *an understanding of psychopathology in obese youth which is broader than considering it a mere consequence of being obese*[7]. To be perfectly clear, we do not state that the latter developmental pathway is non-existent, we only argue that other dynamic pathways that explain the association of obesity and psychopathology may be conceivable. In this respect, it is also important to bear in mind the main findings of chapter 3. It was shown that (1) only some forms of psychological symptomatology decreased during obesity treatment and that (2) a substantial percentage of the participating youngsters still fulfilled criteria for at least one psychiatric diagnosis at the end of treatment. If psychopathology is a mere consequence of being obese, one would expect psychopathology to resolve while losing weight. Further, some authors (Friedman & Brownell, 1995; Zametkin et al., 2004) have argued that more research is needed on why some obese children and adolescents are more susceptible than others to psychopathology related problems. The model should be able to guide such research. Finally, it would be a welcome bonus if the model concurrently

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[7]   It should again be noted that the 'spirit of the times hypothesis' provides us with an explanation of *referral* and not of psychopathology in obese youth. However, given the presumed increased stress levels for obese youngsters in the current society and the knowledge that increased stress is over time associated with increased psychopathology (Grant et al., 2004), the 'spirit of the times' hypothesis does imply the idea that the presence of obesity can at least lead to an increase in existing psychopathology, or even cause new emerging psychological problems.

provided guidelines to assess and treat possible psychological problems in obese youngsters.

A conceptual model on psychopathology in obese youth

The observation that obese children and adolescents often grow up in an inadequate early life-environment is not new. Already a quarter of a century ago, Bruch (1973; 1975) depicted mothers of obese children as 'ambivalent', i.e.: overprotecting, rejecting and anxious at the same time, and unable to reinforce the child for performing competently outside the family. On the basis of a descriptive 12-case study, Christoffel and Forsyth (1989) subsequently also demonstrated family psychosocial disturbance to be a critical factor in the development of early childhood obesity. Psychosocial characteristics of the families with obese children under study included severe family disorganization, episodic separation of mother and child, displacement of child care to others, maternal depression, ineffective limit-setting, denial of the child's problem, hostility towards health care providers and inconsistent follow-up with medical care.

Besides these early clinical observations, cross-sectional studies investigating mean differences between obese youngsters and normal weight controls also evidenced the relevance of adverse family characteristics for childhood obesity. In an experimental study, Baldaro et al. (2003) demonstrated that both children suffering from severe obesity and their mothers have a reduced ability to decode non-verbal expression of emotion than normal-weight controls. Trombini and colleagues (2003) found higher levels of insecure attachment in obese children as compared with normal weight controls. Moreover, obese children's mothers indicated to a larger extent that they make the family their exclusive centre of interest and dedicate themselves to their children with possessiveness and overprotection. Further, Gable and Lutz (2000) found annual household income to be lower in obese children's families. Also, there seems to be a strong inverse association between obesity and SES in women (Sobal &

Stunkard, 1989) and recent studies suggest that this relationship starts including also girls (Berkowitz & Stunkard, 2002).

Finally, two interesting longitudinal studies were conducted on this issue. In a 10-year follow-up study, Lissau and Sorensen (1994) found that both lack of parental support as perceived by the teacher and general hygiene of the child as perceived by the school medical services predicted adult obesity strongly: children characterized as 'dirty and neglected' had a 10-fold risk of becoming obese adults than children with average childhood hygiene and a harmonious support. In a 6-year follow-up study including about 3000 children, Strauss and Knight (1999) found that children who were raised with low levels of cognitive stimulation (including frequency of activity parents did with their child, parental encouragement of engaging in new sports or activities, helping with homework, reading stories etc.) showed the highest risk to develop obesity, independent of other variables such as SES, race, marital status or maternal BMI. An increased risk for obesity was also observed in single mother families.

The previous paragraphs did not aim to provide an exhaustive overview of all in this respect relevant studies. Moreover, some studies conducted on this matter failed to show any differences in family functioning between obese and normal weight children (e.g.: Stradmeijer, Bosch, Koops, & Seidell, 2000). More research is clearly needed on this topic. However, the studies in the previous paragraph again seem to support the existence of a more vulnerable group among obese youth, characterized by negative family experiences. Hence, the reason to push forward Young's schema theory as a candidate comprehensive framework should not surprise, given Young's great emphasis on early parenting experiences for understanding the development of cognitive vulnerability. One might argue that in neither of the studies in this dissertation, the association of adverse family characteristics and maladaptive schemas and/or psychopathology was actually addressed. This is indeed the case, however, we were of the opinion that first of all, some exploratory steps had to be taken to investigate the utility

of Young's theory in (obese) youth. Given the thesis' positive results on this matter, the coast is now clear to disentangle the associations between early life experiences, cognitive vulnerability and psychopathology in obese youth. In this regard, the study by Turner and colleagues (2005) is an exemplary first step. These authors found Young's schemas to be negatively correlated with perceived maternal care and positively correlated with perceived maternal overprotection. Obviously, longitudinal designs would be most appropriate to draw firm conclusions on this matter.

In Figure 2, our current view on psychopathology in obese youngsters is depicted. Based on the insights of Grant and colleagues (2003), we specified the general model for this specific subgroup of youngsters suffering from psychopathology. At the stressor side, we situate the presence of obesity and an adverse familial environment (both chronic conditions). For the time being, we do not offer an opinion on which stressor came first, for it does not alter anything to the discussion of the model. The difficult family environment might have preceded the presence of obesity or vice versa, or both might have originated approximately at the same time. Further, the model still stands if the adverse family context is omitted. This is important for it is not reasonable to assume that difficult early life experiences are/were present in each obese youngster suffering from psychological problems.

The model further includes the role of three important mediators. The presence of obesity is inevitably associated with a process of social stigmatization, including teasing, rejection and victimization by peers, parents and educators. The adverse familial context and/or social rejection lead to the development of maladaptive schemas: a mediating psychological process that, at a certain moment in development, takes the form of a moderator or vulnerability factor (cf. supra). The negative emotions that arise because of at least one of the stressful experiences and, later on, because of the activation of dysfunctional

schemas start off a process of emotional eating[8] (mediating psychological process).

Moderators represent the mechanisms that explain, among other things, why similar processes may lead to varying outcomes, also referred to as multifinality (Grant et al., 2003). Hence, moderators can tell us something about (1) why obesity and psychopathology do not start co-occurring in each youngster that suffers from one of them and (2) why the comorbidity of obesity and psychological problems seems to increase over time (cf. supra). With respect to obesity, there is, as outlined in chapter 1, the undeniable genetic vulnerability (child characteristic) and the fact that in our current society it is, for various reasons, increasingly difficult to adopt a healthy life style (environmental context). That same society considers the attainment of a healthy life style to be a responsibility of the individual and communicated this quite intensively during the past few years (environmental context). Hence, more and more, obese people are looked upon as individuals who are not able to take responsibility for their own health. With respect to psychological problems, we presume, on the basis of Young's theory, that (emotional) temperament (child characteristic) is an important moderating factor in the development of maladaptive schemas and that youngsters with a predominantly avoidant coping style (child characteristic) might be vulnerable to develop an emotional eating style to cope with negative emotions. Finally, we consider age to be an important moderating variable (child characteristic). In chapter 2, it was demonstrated that in obese youngsters, age is predictive for the presence of a mental disorder. To explain this finding, we put

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[8]   The concept of emotional eating and the ideas of the affect regulation model (Grilo, Shiffman, & Cartercampbell, 1994) were noticed shortly in chapters 4 and 5. There is a bulk of literature on this topic, which we considered beyond the scope of the present dissertation. For the present purpose, it is important to know that   referred obese youngsters report emotional eating (Braet & Van Strien, 1997) and that this eating style seems to be associated with higher levels of psychopathology (Braet & Ipema, 1997). Further, loss of control over eating also seems to be associated with the presence of negative emotions (see e.g.: Tanofsky-Kraff et al., 2007).

forward the idea that being obese in early life might form a scar, leading to psychopathology when confronted with stress ('scar' hypothesis). Placed within the broader context of the model outlined above, it now becomes clear that not only being obese but also the presence of an adverse early life environment can lead to the formation of a scar or vulnerability.

Understanding the findings of chapters 4 and 5

In chapter 4 and 5, the presence of maladaptive schemas in obese adolescents was demonstrated. In chapter 4, it was shown that both in referred and non-referred obese youngsters, cognitive vulnerability is associated with the presence of eating disorder, i.e., loss of control over eating, dietary restraint attitudes and eating and shape concern, and depressive symptoms. In chapter 5, an association of dysfunctional schemas and internalizing and externalizing symptoms was demonstrated[9]. Placed within the general framework of Grant and colleagues, one can clearly see how Young's theory provides us with a broader conceptualization of this cognitive vulnerability[10] for psychopathology in obese youngsters. It is assumed that the stressors that actually accounted for the development (or the activation) of maladaptive schemas are not necessarily obesity-related: they can be multiple and divers. In future research, the specific nature of these stressors in obese youth and their association with schemas and

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[9]   The attentive reader will notify that in chapter 5, regression analyses were done in the sample as a whole, including both obese and normal-weight youngsters, and that is hence unjustified to state that in obese adolescents, schemas are generally associated with internalizing and externalizing symptoms. However, for the present purpose, we re-examined the data of chapter 5 and constricted our analyses to the obese group. Again, significantly positive associations of schemas on the one hand and internalizing and externalizing problem behaviour on the other hand were found.

[10] One could argue that the abovementioned conceptualization in terms of obesity-related an non-obesity-related aspects of self-esteem is not all that different than the model proposed here. Indeed, self-esteem can be considered an alternative operationalization of cognitive vulnerability. However, both from a (future) research and clinical perspective we consider Young's theory more suitable, given his great emphasis on the (familial) origin of schemas and the fact that he provides a more diversified conceptualization of cognitive vulnerability.

psychopathology should be investigated[11]. Further, the model generates hypotheses on vulnerability and protective factors that need to be examined. Given the dynamic and reciprocal relationships among variables, the model retains the possibility that obesity precedes cognitive vulnerability and/or psychological problems, but can also explain how in some youngsters, cognitive vulnerability and/or psychopathology leads to obesity or alternatively, how both can originate at the same time.

The precise temporal relationship of obesity and psychopathology in youth

Only longitudinal research can give a decisive answer on the precise temporal relationship of obesity and psychopathology. Unfortunately, at the moment, only a few of these studies are available and most of them suffer from severe methodological weaknesses. In a population-based sample, Pine, Cohen, Brook and Caplan (1997) demonstrated a positive association of adolescent conduct disorder symptoms and BMI in young adulthood, nine years after baseline assessment. The results also showed a positive correlation between adolescent depression and young adult BMI in males but not in females. However, the study is limited as no weight related measure was obtained at baseline. In a large community sample of adolescents, Goodman and Whiteaker (2002) found that depressed mood at baseline predicted obesity at one year follow-up, after controlling for variables including race and SES. This

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[11] We are aware that 'an adverse familial environment' is a very broad concept that should be concretized within the context of childhood and adolescent obesity. We also acknowledge that maladaptive parenting practices might relate to the development of obesity in other ways than via the development of cognitive vulnerability.   For example, Johnson and Birch (1994) demonstrated that high parental control with respect to feeding practices makes children less able to self regulate their food intake, which was in turn related to increased body mass. Or: a parent's general inability to sensitively respond to a child, mostly includes an inappropriate responding to the child's appetite and feeding cues, which may prevent the infant from developing the ability to regulate and manage food intake normally (Cooper, 2005). Hence, the 'full picture' of family functioning in obesity is obviously much more complicated than presented here. However, we considered it beyond the scope of the present dissertation to include all these components in the model.

association was also established among those who were not obese at baseline. Baseline obesity was not related to depressive mood at follow-up. A four year follow-up study (with annual assessments of BMI) by Stice, Presnell, Shaw and Rohde (2005) in a community sample of normal weight young adolescent girls, demonstrated that dietary restraint, radical weight-control behaviours and depressive symptoms predicted obesity onset. The findings on dietary restraint replicated the results of a similar prospective study on weight control efforts in adolescent girls (Stice, Cameron, Killen, Hayward, & Taylor, 1999). Unfortunately, neither in the Pine et al. (1997) study nor in the studies by Stice and colleagues (1999; 2005), psychological assessment was provided at follow-up, so no conclusions can be drawn on the predictive value of baseline obesity for subsequent psychopathology[12]. Recently, Anderson, Cohen, Naumova, Jacques and Must (2007) prospectively observed, at four time points over a 20-year period, a community sample of 776 youngsters who were free from anxiety and depression at the initial assessment. The authors demonstrated that adolescent obesity in females predicted an increased risk for subsequent major depressive and anxiety disorder. In boys, this association could not be confirmed. Clearly, the field would greatly benefit from methodologically sound prospective studies like the one by Goodman and Whiteaker (2002). However, we presume that such studies will not lead to a decisive answer on *the* developmental pathway at play, unless also moderators and mediators are similarly assessed. It remains important to acknowledge the presence of considerable variation in psychological (dys)functioning within the obese population (Bosch, Stradmeijer, & Seidell, 2004; Friedman & Brownell, 1995). Hence, obese children displaying psychological problems might vary regarding

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[12]   In this regard it should be noted that the studies by Fairburn and colleagues (Fairburn, Cooper, Doll, & Welch, 1999; Fairburn et al., 1998; Fairburn, Welch, Doll, Davies, & O'Connor, 1997) that were repeatedly quoted throughout the dissertation, and that defined childhood obesity as a risk factor for eating disorders in adulthood were based on retrospective reports on childhood obesity by adults with eating disorders.

their developmental psychopathology trajectories and even within subjects, pathways might become mixed up.

Strengths and limitations of the present research

Most of the strengths and shortcomings in this dissertation were already addressed in the discussion sections of the empirical studies. Hence, in this paragraph, we will summarize the general strengths and weaknesses.

One major disadvantage of the present dissertation is that, except for in chapter 3, in none of the studies a longitudinal design was adopted. Both cognitive theory and Grant's model are impregnated with assumptions on temporal relations, but not any of them can be confirmed on the basis of the present findings. Our conclusions get stuck on the level of associations between variables. In further research, the adoption of longitudinal designs is an absolute must, so the tenability of the temporal relationships of Young's theory in youth can be investigated. The importance of prospective studies for developmental psychopathology research can hardly be overstated (Braet & van Aken, 2006).

A second major weakness of the dissertation is that, besides in chapter 7 (and to some extent also in chapter 4 and 6), we never took into account possible effects of comorbidity. Psychological comorbidity refers to the co-occurrence of psychological symptoms and disorders within one individual. In child and adolescent psychopathology, comorbidity seems the rule rather than the exception. For example, in the epidemiological study by Ford, Goodman and Meltzer (2003) mentioned in chapter 1, of the youngsters with any psychiatric diagnosis, 22% had two, 5% had three, 2% had four and 0.4% had five disorders. In the present dissertation also, each study that included a structured clinical interview (chapter 2, 3, 6, 7) consistently demonstrated that a substantial number of participants suffered from more than one psychiatric diagnosis. Given the presence of comorbidity, one can never be sure whether an established association between cognitive vulnerability and some form of (broad-band or

small band) symptomatology or disorder is unique to that symptoms/disorder or serves as a non-specific psychopathology risk factor (Grant et al., 2003). Likewise, a failure to find content-specificity of cognitions and symptoms might be due to the masking effects a highly comorbid condition (Clark et al., 1999). With respect to the present dissertation, one could for example argue that, given the results of chapter 4, we should have controlled statistically for pre-existing levels of ED pathology when investigating the association of maladaptive schemas and internalizing and externalizing symptoms in (obese) youth in chapter 5. When dimensional psychopathology measures are used, the adoption of varying forms of psychopathology as covariates in the statistical analyses, might indeed provide a solution. In case of categorical assessment of psychopathology 'pure' and 'comorbid' cases can be compared with 'diagnose free' individuals. However, given that all psychological problems correlate to a certain extent, it is self-evident that both types of research designs require very large sample sizes in order to achieve acceptable statistical power. Another solution would be to adopt psychopathology measures with highly discriminative power (Clark et al., 1999). In chapter 7, we addressed the comorbidity of depression and disruptive behaviour. Given the study design, we can reliably state that the high scores on the Disconnection/Rejection domain are not attributable to referral for antisocial behaviour. It *looks* as if this cognitive content is specific for depression. However, to be perfectly sure, we should have included both a group of depressed youngsters without disruptive behaviour disorders and a group of non-depressed youngsters without antisocial problems.

Further, many strengths and weaknesses can be discussed in light of one of developmental psychopathology's main methodological tenets, i.e., that a multi-method multi-informant approach should be adopted where and as far as possible. In chapter 1 and 2, we outlined this issue with respect to epidemiological psychopathology research in youth. It was concluded that the most reliable and encompassing view on the presence of psychopathology in

youngsters is obtained by combining the use of different *methods*, i.e., clinical interviews and self-report questionnaires (Grietens, 2008), and by questioning multiple *informants* (Achenbach, Mcconaughy, & Howell, 1987). Broadly speaking, the same holds for the assessment of cognitive vulnerability and stress. However, methodologically, the adoption of a multi-method multi-informant format is important for other reasons than enhancing the reliability of measurement. Research on cognitive vulnerability within the 'therapeutically-oriented tradition' is often criticized because only one assessment method, i.e., self-report questionnaires, is used. Therefore, one can never be sure whether the established associations are real or should be ascribed to what is commonly referred to as 'shared method variance'. The inclusion of multiple informants controls for the part of shared method variance that is due to relying on one common rater. Obviously, the inclusion of multiple methods solves this issue of method confounding.

Hence, a clear strength of many empirical studies in this dissertation is the inclusion of multiple informants for the (dimensional) assessment of psychopathology (chapter 2, 5, 7). Another strength is the adoption of multiple methods for the assessment of psychopathology (chapters 2, 3, 6, 7). In some studies, the psychiatric diagnoses obtained with the Structured Clinical Interview for DSM-IV – Child Edition (KID-SCID: Hien et al., 1994) were only used descriptively (chapter 7), whereas in others this categorical assessment of psychopathology was used as a predictor (chapter 3) or outcome variable in the statistical analyses (chapter 2, 3, 6). In chapter 2, but especially in chapter 3, it was illustrated that the dimensional and the categorical approach measure different aspects of psychopathology, and can be differentially related to other variables. In this regard, the studies reported on in chapter 2 and 3 clearly add to the literature on psychopathology and obesity (treatment) in youth, given that in past research on this topic, structured interviews were seldom used. In chapter 6, the results obtained with the interview were highly comparable to those

established on the basis of the questionnaire data, which strengthened our findings on content-specificity.

However, in this thesis, all studies on cognitive vulnerability (chapters 4, 5, 6, 7) and the study on stress (chapter 7) are limited because no multi-method approach was adopted, neither for the assessment of maladaptive schemas, nor for the assessment of stressors. This limitation should be acknowledged. As outlined in chapter 1, performance based measures provide an alternative method to assess the presence of maladaptive schemas[13]. To validate our results on Young's theory in youth, future studies should include performance based measures to assess cognitive vulnerability. However, it will be a real challenge to incorporate Young's ideas into the existing experimental paradigms of cognitive child and adolescent psychopathology research. We are aware of only one relevant study in adults (Meyer & Waller, 2000). For the measurement of stressors, interviews as well as self-report questionnaires are to be used. To assess *current* stressors, performance based measures can often also be included. In this regard, we refer to the study of Jacquez et al. (2004) for some interesting laboratory measures of maternal rejection. Peer rejection can for example be assessed with peer nomination techniques (see e.g.: Prinstein & Aikins, 2004).

Applying a theoretical cognitive psychopathology model for adults in an adolescent population represents a so-called top-down approach. However, from a developmental psychopathology perspective, the use of a top-down approach to study psychopathology in youth is perhaps not very appropriate. A so-called bottom-up strategy might for example suggest that adolescents, when asked by open-ended questions, report on cognitive vulnerability along other dimensions than those captured in Young's schema taxonomy. This should be kept in mind when interpreting the results of the present dissertation. Youngsters might

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[13]   The inclusion of multiple informants for the assessment of cognitive vulnerability is not aimed at. Maladaptive schemas are considered so private that other individuals cannot reliably report on it.

acknowledge Young's maladaptive schemas but this does not necessarily mean that it represents their *spontaneous* way of thinking about themselves, the surrounding world and their relationships with others. In future research, it would be very interesting to include also bottom-up strategies when investigating maladaptive schemas in youth.

Theoretically, it could be argued that only participants who consistently use the coping style of schema surrender will fill out the YSQ in a reliable way. Individuals with an avoidant or compensating coping style will respectively deny the importance of a specific maladaptive schema or indicate other schemas than those actually present. The latter is especially problematic when investigating content-specificity. Furthermore, given the assumption that coping styles vary across schemas and situations, one could argue that empirical results obtained on the basis of the YSQ are in fact worthless. Obviously, this conceptual issue seriously hampers the interpretability of the present dissertation's results. Given that coping styles generally operate out of awareness (Young et al., 2003), the inclusion of performance based measures of cognitive vulnerability would not have provided a solution to this. In fact, one can only conclude that Young's ideas on coping styles make it virtually impossible to conduct any reliable empirical research on maladaptive schemas. That, of course, would be a very pessimistic viewpoint. First of all, the validity of Young's coping style concept remains to be tested. Secondly, it should be noted that Young developed two inventories to assess schema avoidance and schema compensation, i.e., the Young-Rygh Avoidance Inventory (Young & Rygh, 1994) and the Young Compensation Inventory (Young, 1995). We are aware of two studies in adults that included these coping style measures. However, in these studies, the questionnaires were used to investigate the presence of avoidant and compensatory coping in alcohol and opiate abuse (Brotchie, Hanes, Wendon, & Waller, 2007) and in bulimic problems (Spranger, Waller, & Bryant-Waugh, 2001). In our opinion, it would be especially interesting to investigate, on the

basis of these inventories, whether coping strategies alter the association of maladaptive schemas and psychopathology.

It could also be argued that a cognitive diathesis-stress perspective on psychopathology makes it virtually impossible to assess cognitive vulnerability on the basis of self-report questionnaires in individuals who are currently *not* experiencing stress (and hence psychological problems). As outlined in chapter 1, it is presumed that schemas remain latent in the absence of stressful and/or schema relevant experiences. Two objections can be made against this criticism. First of all, when cognitive theory's dimensional approach to cognitive vulnerability and psychopathology (Clark et al., 1999) is extended to stress variables also, one might suppose the presence of at least some degree of stress in each individual. However, this does not entirely solve the issue, as one might presume stress levels to be directly proportional to the extent to which schemas are activated. Therefore, we attend to an experimental adult study by Lundh and Czyzykow-Czarnocka (2001) in which a priming effect of the YSQ was demonstrated. Subjects who were administered the YSQ Abandonment/Instability schema subscale prior to an emotional Stroop task with separation-related and neutral words, showed larger interference scores as compared with subjects who completed the YSQ subscale after the Stroop task. Although further research is definitely needed on this topic, these findings suggest that the administration of the YSQ per se is sufficient to activate latent maladaptive schemas. This corroborates with one's subjective experience when completing the YSQ, as items belonging to the same schema are presented successively.

We end with two minor limitations. Firstly, it should be noted that the referred samples of obese adolescents included in the present dissertation, were always recruited via an *in*patient treatment programme. Therefore, it remains unclear to what extent the results in chapter 2, 3, 4 and 5 can be generalized to youngsters presenting for *out*patient treatment. Secondly, we should be aware

that we conducted research in *adolescents*. It would be very interesting to investigate whether Young's theory holds in children also. However, the use of self-report questionnaires to assess maladaptive schemas raises specific concerns with regard to developmental appropriateness (see e.g.: Garber, 1992).

Clinical implications

Overall, the present dissertation provides support for the tenability of Young's cognitive model in youth. Hence, in clinical practice, schema therapy might create interesting new perspectives for assessment and treatment of youngsters suffering from psychopathology. We certainly acknowledge that, given the limitations of the present dissertation, more research is first and foremost needed to confirm the utility of Young's model in youth. Moreover, even in adults, the effectiveness of schema therapy is yet to be demonstrated. As mentioned in chapter 6, a randomized control trial revealed promising results of schema therapy in personality disordered individuals (Giesen-Bloo et al., 2006). However, no similar studies were conducted in adults with Axis-I pathology. Obviously, given that the incorporation of Young's model in youth is still in its infancy, no treatment studies in adolescents are available yet.

In the diagnostic phase, the YSQ can be administered to get an overview of the cognitive themes at play for the adolescent in question. The YPI can be used to test specific hypotheses on the parental origin of the present maladaptive schemas. However, we acknowledge that focusing solely on the parents to explain cognitive vulnerability in youth, might be too narrow-minded. Hence, the diagnostician should also evaluate alternative origins in the formation of maladaptive schemas, such as peer influences. We would also like to stress that, from a clinical viewpoint, the YPI might be a very guilt-inducing instrument. To remain loyal to their parents, youngsters might fill out the questionnaire in a

socially desirable way[14]. This is obviously less problematic in Young's population, since adults are more likely to be largely detached from their parents. Finally, in our opinion, the model of Grant and colleagues (2003) as depicted in Figure 1 might, in the assessment phase, serve as a useful template to generate hypotheses on factors that contribute(d) to the origin and maintenance of the adolescent's psychological problems. This way, the diagnostician departs from an evidence-based viewpoint on psychopathology, i.e. a diathesis-stress model, and forces himself to consider many possibly contributing factors.

We consider it beyond the scope of the present discussion to go very detailed into Young's schema therapy. Also, given what was said in the first paragraph of this section, it would be a little premature to just consider all components useful and justified in adolescent treatment. Meanwhile, we highlight some aspects of schema therapy that can, in our opinion, be easily integrated in and provide an added value for existing cognitive treatment protocols for adolescents. According to Young (2003), the therapist should educate the patient about the schema model. Psycho-education on cognitive theory's viewpoint on psychopathology is an essential component of all cognitive behavioural treatment (CBT) protocols, as it concurrently provides the treatment rationale. However, a clear explanation of the idea of maladaptive behaviour as a way of coping with negative emotions associated with the activation of schemas and of the three coping styles, might create an added value. For youngsters with disruptive behaviour disorders who also exhibit depressive symptoms (chapter 7), the concept of 'schema overcompensation' might provide a better insight into their feelings and behaviours. For obese

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[14] As noted, we are aware that social desirability is always at play when conducting when using self-report questionnaires, in research as well as in clinical practice. However, we consider the YPI as an instrument that is extremely vulnerable for socially desirable answers *in clinical settings*. Given that youngsters participated anonymously in empirical studies, we suppose this might be less problematic in research.

youngsters suffering from LC, the same might hold for the 'schema avoidance' concept. Also, the distinction between three different coping styles, might give youngsters the idea that, when faced with a schema, they do have a choice and *can* react differently than they always do. It might also supply them with more insight into the differences and parallels with other youngsters' (maladaptive) behaviour. Young's hypotheses on the parenting origins of maladaptive schemas might in theory also create an opportunity to broaden 'classic' psycho-education in adolescent cognitive therapy. However again, in adolescents this might be a very difficult topic to address. We presume a long-term therapeutic relation might be a necessary (but not a sufficient condition) for youngsters to be willing and able to address such issue.

We would like to end with an example of how Young's schema taxonomy might be integrated in existing treatment protocols. In their cognitive protocol for emotional disorders, Greenberger and Padesky (1995)[15] assess what they refer to as 'core beliefs' by means of the Arrow-down technique (Burns, 1980). The patient is asked to tell the therapist about a recent negative situation that exemplifies the sort of problems he has struggled with for years (e.g.: the patient reacted very emotionally on a small discussion with a fellow pupil, the other students considered this reaction strongly exaggerated). The patient also has to report on the associated feelings (e.g.: sadness, anger) and automatic thoughts (e.g.: 'I'm sure that she doesn't like me'[16]). By asking specific questions on these automatic thoughts (e.g.: 'What would it mean to you if she doesn't like you?'), the therapist tries to come down to underlying assumptions (e.g.: 'It would be horrible because she's the most popular girl in class', 'If the most popular girl in class doesn't like me, I belong to the losers') and finally to the activated core belief(s) (e.g.: 'I am worthless') that generated the intense

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[15] The protocol 'Mind over mood' is essentially meant for adults but can easily be used in (older) adolescents suffering from, for example, anxiety or depression.

[16] We took the examples of automatic thoughts, assumptions and core beliefs from Bögels and Van Oppen (1999).

emotional response to the situation. In this regard, the assessment of the YSQ might provide an additional broad screening on possibly relevant underlying maladaptive schemas. The (time-consuming) Arrow-down technique carries the risk of overlooking important schemas. Moreover, corroborating results on both techniques can confirm hypotheses on the presence of specific schemas more strongly. Finally, the use of the Arrow-down technique enables therapists to demonstrate the patient how schemas (as assessed with the YSQ) and coping styles influence reality-based daily life situations. Such insights might have important therapeutic value.

For obese youngsters, the main clinical significance of the present dissertation's findings is in our opinion twofold. First of all, even when obese youngsters don't present for treatment, there might be a reasonable chance that they do suffer from psychological symptoms and/or disorders. Hence, the cliché of the 'happy fatty' should not throw dust in our eyes. There is definitely a health (see chapter 1) and possibly also a mental health (see chapter 2) concern. An important task is reserved here for adults who work with children and adolescents on a regular basis. Teachers, school psychologists and adults guiding leisure activities should be attentive to signals of maladaptive functioning, alert youngsters to their problems and refer to specialists when indicated. Secondly, in obesity treatment programmes, a psychological care component seems indicated for a subgroup of obese children and adolescents. Given its, albeit limited, association with weight loss during treatment, psychopathology might lead to withdrawal (cf. infra) and hence feelings of failure. From a mental health perspective, it is not proper that youngsters who went into and fully accomplished treatment, albeit for their weight, still suffer from psychological disorders afterwards. Given that obesity is often considered a medical problem with psychological consequences, the general idea is that psychopathology will resolve while losing weight. The results of chapters 3 to 5 show another picture: in a large number of obese youngsters, psychopathology remains, and seems to

be grounded in other things than being obese. Should psychotherapy be a standard component of obesity treatment in youth? We don't think so. Assessment of psychopathology at the beginning of treatment will enable clinicians to identify youngsters 'at risk'. A broad assessment of factors possibly associated with psychopathology is indicated for this subgroup, just like some form of psychotherapy attuned to the obtained psychological profile.

Future research directions

Many ideas for future research were already given in the discussion sections of each chapter and also throughout the present general discussion. These will not be repeated here again. However, in the present section, we would like to develop two particularly interesting future lines of research in depth.

When do maladaptive schemas start to operate as vulnerability factors?

At the beginning of this chapter, we argued that the cognitive theory of psychopathology might not be dynamic enough to understand the developmental aspects of cognitive vulnerability. Therefore, we reconsidered the present dissertation's findings in light of a general comprehensive developmental psychopathology model (Grant et al., 2003). In this regard, it was outlined that during childhood and adolescence, cognitive vulnerability most probably functions as a mediator and later on starts operating as a vulnerability factor. Hence, a, especially interesting line of research would be to investigate at which time point in development a particular maladaptive schema turns from a mediator into a moderator. In this regard, the work of Cole and colleagues on depression in youth is worth mentioning. In their methodologically sound studies (including also longitudinal designs), these authors used different kinds of operationalizations of on the one hand cognitive vulnerability, i.e., attributional style (Abramson, Seligman, & Teasdale, 1978), cognitive errors (A. T. Beck, 1967), self-perceived competence (Harter, 1983), and on the other hand current

stress, i.e., negative life-events and parental and peer rejection. Across operationalizations, the authors consistently found that cognitive vulnerability *mediates* the association of current stress and depression in youth (Cole & Turner, 1993; Jacquez et al., 2004; Tram & Cole, 2000). However, they also showed the impact of development. For example, in a cross-sectional study, they found that cognitive style *moderated* the association of negative life-events and depression in 14 year olds, but not in 10 and 12 year olds (J. E. Turner & Cole, 1994). Recently, the latter findings were replicated in a longitudinal study (Cole et al., 2008).

A methodologically adequate test of the mediating versus moderating role of cognitive vulnerability in the association of currently experienced stress and psychopathology in youth requires a longitudinal design in a sufficiently large sample of adolescents of varying age. Ideally, both adolescents and their parents are questioned. Repeated assessments of all variables should be organized. Hence, although such study is a typical example of the theory-driven research on stress and psychopathology Grant and colleagues (Grant et al., 2003) wanted to stimulate, the aspired design will be time-consuming and expensive.

Psychopathology and attrition in childhood and adolescent obesity treatment

In chapter 3, about 8% of the adolescents enrolled in the treatment programme, left the centre untimely, against the advice of the medical staff. It could be assumed that the presence of psychological symptoms and mental disorders complicates obesity treatment in terms of drop-out.

Although non-completion is a major source of concern in treatment of obese youth[17], only one study has explicitly examined psychopathology as a

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[17] One could argue that a drop-out rate of 8%, as established in chapter 3, is rather low and should therefore not be considered 'a major source of concern'. In the study by Braet, Tanghe, Decaluwé, Moens and Rosseel (2004) a comparable attrition rate of about 5% was found. However, in other studies on drop-out in pediatric obesity programmes (Cote et al., 2004; Germann, Kirschenbaum, & Rich, 2006; Zeller, Kirk

predictor of attrition. Zeller et al. (2004) demonstrated in a relatively large sample of North-American obese children and adolescents that non-completers displayed higher levels of self-reported depressive symptomatology and parent-reported externalizing problem behaviour as compared with completers. Unfortunately, no assessment of eating pathology was included in the study. More research is needed on this topic to obtain a full picture of how psychopathology generally affects childhood and adolescent obesity treatment. Just like in chapter 3, research on (psychological) determinants of weight loss is mostly conducted in completers only, which is, to the extent that predictors of weight loss and attrition are supposed to be similar, a particularly inadequate strategy (Teixeira et al., 2005; Zeller, Kirk et al., 2004).

Interestingly, Cote and colleagues (2004) in this respect cautioned for a restricted focus on 'defective' patient characteristics and made a plea for including the patient's evaluation of services when investigating treatment completion. They demonstrated, among other things and also in a North-American sample, that parents who rated their child as less healthy and the quality of care as lower, were significantly more likely to leave the programme untimely. Furthermore, in this study parents of non-completers were questioned on possible reasons for drop-out and what the programme could have done to facilitate their return. Main reasons for non-completion were difficulties with

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et al., 2004), attrition rates as large as 64%, 88% and 55% respectively, were established. In adults also, figures on drop-out tend to vary considerably (between 6 and 55%: Teixeira, Going, Sardinha, & Lohman, 2005). Obviously, treatment completion in obese individuals does deserve our attention. One reason for the low drop-out rates in chapter 3 and in the Braet et al. (2004) study might be that in both cases an *in*patient treatment programme was involved, whereas we presume that the other three studies (Cote et al., 2004; Germann et al., 2006; Zeller, Kirk et al., 2004) concerned *out*patient treatment. Finally enrolling in inpatient treatment means a great investment, to which one might not easily come back. Also, in outpatient settings, treatment duration might be positively associated with attrition (Germann et al., 2006), whereas in inpatient settings this is not necessarily the case. In sum, it could be argued that concerning drop-out different processes are at play in out- and inpatient programmes and hence study results can best be interpreted as setting-specific.

medical insurance coverage and the child's desire to leave the programme. As noted appropriately by Zeller and colleagues (2004), understanding attrition in pediatric settings is potentially more complex as 'the patient' is both the child/adolescent as well as the parent(s). Suggestions to facilitate families to return included that assistance should have been provided with insurance problems (24%) and that a simple follow-up phone call would have been sufficient in promoting return (12%). In chapter 3, we questioned the staff of the treatment centre on the concrete reasons for non-completion, as was done also by Braet and colleagues (2004). Such reports provide us with interesting qualitative data on the patients' and the institution's perspective, which might supplement findings from quantitative analyses. Finally, in the discussion of their study, Cote and colleagues make a plea for distinguishing between so-called 'early drop-outs' and 'late drop-outs'[18], since very different processes might underlie non-completion in these groups. In this regard, Zeller et al. (2004) established that non-completers were not accomplishing weight loss when they withdraw, in contrast to completers. We assume that limited weight loss might be a reason for attrition in late but not in early drop-outs. Note that in chapter 3, the presence of a psychiatric disorder was associated with less weight loss after four months. Given that limited weight loss is a reason for youngsters to withdraw, this finding is of special clinical relevance.

In chapter 2, it was argued that research on psychopathology in obesity would greatly benefit from studies on the importance of degree of overweight and demographic factors (Faith, Matz, & Jorge, 2002; Friedman & Brownell, 1995). In the study by Zeller and colleagues (2004), non-completers were more likely to have a higher degree of overweight, to be older and black, to live within a single caregiver family and to participate in the programme at no cost

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[18]   Who is considered an 'early drop-out' and who a 'late drop-out' is obviously largely dependent of treatment duration. Hence, treatment length should be taken into account when defining such categories.

(insurance type). When in this study all variables differentiating significantly between completers and non-completers were entered simultaneously in a multivariate analysis, race, age, insurance type and self-reported depressive symptomatology remained significant independent predictors. Hence, considering the role of psychological variables alone might not sufficiently capture the multifaceted reasons for non-adherence to treatment. As such, the role of demographic factors, degree of overweight and psychopathology should be considered simultaneously to determine their unique contribution in predicting drop-out in childhood and adolescent obesity treatment.

In this regard, we are aware that findings of studies on the influence of demographic factors on attrition conducted in North-America cannot easily be generalized to European samples. As mentioned in chapter 2, a country's social security system might have strong impact on treatment seeking, but also on drop-out. The specific type of health care insurance one receives differs largely across continents and countries. However, also *within* country variability exists, mostly dependent on the socio-economic group one belongs to[19]. Likewise, attrition apparently depends on race (Zeller, Kirk et al., 2004), but ethnic diversity also varies greatly across continents and countries. Hence, the country-specific impact of insurance type, race and socio-economic status on attrition might hamper cross-country comparison of the predictive value of other demographic factors, degree of overweight and psychopathology on drop-out. In short, research on attrition is probably most interesting from a national policy perspective. The results of such studies can guide the optimization of individual obesity treatment programmes but can also provide recommendations for taking

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[19] As mentioned in chapter 2, the public Belgian health insurance system seems to 'favor the poor' (van Doorslaer, Masseria, & Koolman, 2006). It should however be noted that the Belgian system does not provide full coverage of health care for 'poor' people. In this regard, we recall that in chapter 3, two siblings dropped out of treatment because their father was not able to pay the accounts.

steps on a government level. In this regard, studies in nearby countries, can reveal how a (slightly) differently organized health care system performs.

Finally, on the basis of the study results presented in chapter 3 in combination with the Zeller et al. (2004) finding that limited weight loss during treatment predicts attrition, it should be investigated whether the incorporation of evidence-based psychotherapy can affect treatment outcome in terms of weight loss and attrition in youngsters suffering from psychological problems. From a mental health perspective, one could argue that this would prove very helpful anyway.

Conclusion

The present dissertation provides preliminary support for the tenability of Young's schema theory in adolescents. Young's model adds to earlier cognitive psychopathology models in youth by providing a diversified taxonomy of cognitive content and concretizing the role of adverse childhood experiences in the origin of maladaptive schemas. This creates interesting new research perspectives and might have important clinical implications for psychopathology in youth in general and in obese adolescents in particular. However, we are concerned with the theory's total disregard of developmental aspects during childhood and adolescence. Most probably, this is due to Young's focus on clinical work with *adults*. We also regret schema theory's narrow, almost exclusive, focus on parenting experiences to explain the development of maladaptive schemas. This might in turn be attributed to the *kind* of adult population Young had in view, i.e., those suffering from Axis-II psychopathology or more chronic forms of Axis-I disorders. Hence, from a developmental psychopathology perspective, we particularly suggest a revision of these two aspects of the theory.

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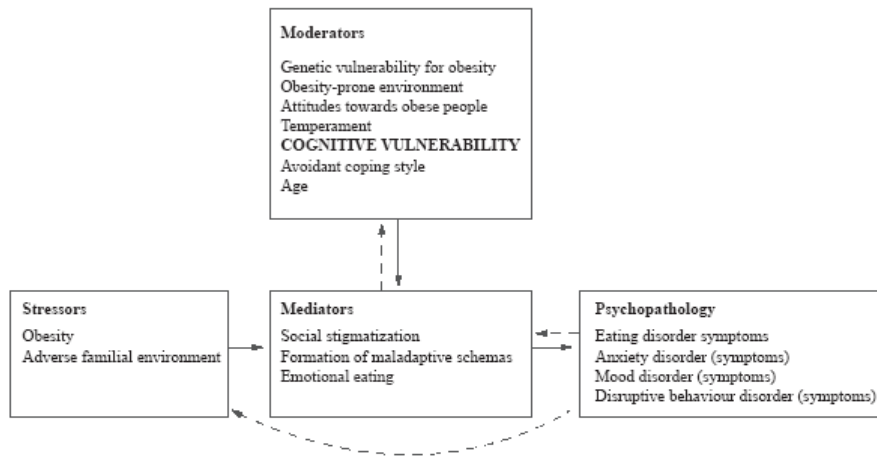
Figures

Figure 1. *General developmental psychopathology model (Grant et al., 2003)*
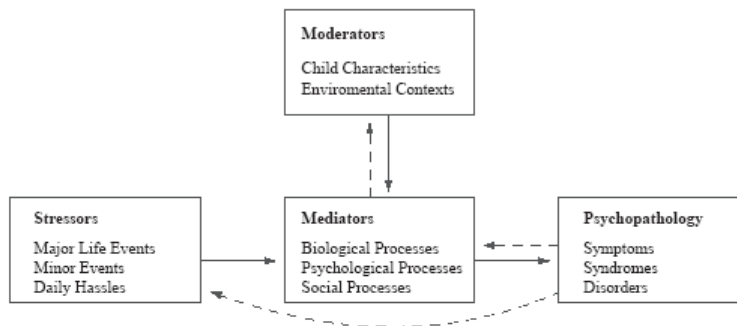
Central Propositions of General Conceptual Model:

1.   Stressors contribute to psychopathology
2.   Moderators influence the relation between stressors and psychopathology
3.   Mediators explain the relation between stressors and psychopathology
4.   There is specificity in the relations among stressors, moderators, mediators and psychopathology
5.   The relations among stressors, moderators, mediators and psychopathology are reciprocal and dynamic

Figure 2. *Conceptual model of psychopathology in obese children and adolescents*

Moderators

Genetic vulnerability for obesity
Obesity-prone environment
Attitudes towards obese people
Temperament
COGNITIVE VULNERABILITY
Avoidant coping style
Age

Stressors

Obesity
Adverse familial environment

Mediators

Social stigmatization
Formation of maladaptive schemas
Emotional eating

Psychopathology

Eating disorder symptoms
Anxiety disorder (symptoms)
Mood disorder (symptoms)
Disruptive behaviour disorder (symptoms)

Nederlandse samenvatting

Naar een beter begrip van psychopathologie bij adolescenten: Cognitieve kwetsbaarheid bij obese en niet-obese jongeren

De globale doelstelling van deze verhandeling bestaat erin cognitieve kwetsbaarheid te onderzoeken bij adolescenten. In het bijzonder wordt de bruikbaarheid van Young's schema theorie getoetst bij obese en niet-obese jongeren. Het proefschrift bestaat uit acht hoofdstukken: een algemene introductie, zes empirische studies en een algemene discussie. De empirische studies zijn gebaseerd op in totaal 13 verschillende datasets (voor een overzicht: zie tabel 1)

Hoofdstuk 1: Cognitieve kwetsbaarheid en ontwikkelingspsychopathologie: Een introductie

Hoofdstuk 1 schetst de theoretische achtergrond van de empirische studies. Er wordt kort stilgestaan bij een aantal belangrijke thema's in onderzoek naar psychische problemen bij kinderen en adolescenten en vervolgens wordt het cognitieve model van psychopathologie toegelicht. Aangezien vier empirische studies zich expliciet focussen op (cognitieve kwetsbaarheid bij) een specifieke subgroep van jongeren met psychische problemen, met name *obese* jongeren, wordt een uitgebreid overzicht geboden van de huidige stand van zaken in het wetenschappelijk onderzoek naar (psychische problemen en) obesitas tijdens de kindertijd en jeugdjaren.

Epidemiologisch onderzoek toont duidelijk aan dat een substantieel aantal kinderen en jongeren tijdens hun jeugd te kampen krijgt met psychische problemen (Costello, Egger, & Angold, 2005; Costello, Mustillo, Erkanli,

Keeler, & Angold, 2003; Ford, Goodman, & Meltzer, 2003; Verhulst, van der Ende, Ferdinand, & Kasius, 1997). De ontwikkelingspsychopathologie is een relatief jonge discipline die zich toespitst op het bestuderen van kinderen en jongeren met emotionele en gedragsmatige problemen vanuit een ontwikkelingsperspectief (Braet & van Aken, 2006; Masten, 2006). Onderwerp van debat binnen deze tak van de wetenschap blijft welk theoretisch model het meest geschikt is om psychische problemen bij kinderen en jongeren te conceptualiseren.

In de jaren '60 formuleerde Beck zijn cognitieve theorie ter verklaring van depressie bij volwassenen (A. T. Beck, 1967; A. T. Beck, Rush, Shaw, & Emery, 1979). Later breidde hij zijn model ook uit naar andere vormen van psychopathologie, zoals bijvoorbeeld angst en persoonlijkheidsstoornissen (A. T. Beck, 1976; A. T. Beck, Emery, & Greenberg, 1985; A. T. Beck & Freeman, 1990). Het cognitieve model gaat ervan uit dat disfunctionele of maladaptieve schema's ten grondslag liggen aan het ontstaan en het voortbestaan van psychische problemen. Daarom benoemt men ze ook wel eens als 'cognitieve kwetsbaarheidsfactoren' of 'diatheses'. Schema's worden opgebouwd doorheen het leven en blijven latent aanwezig totdat ze geactiveerd worden door schemarelevante of stressvolle gebeurtenissen ('diathese-stress hypothese', zie: Clark, Beck, & Alford, 1999). Eens geactiveerd, verstoren disfunctionele schema's de normale informatieverwerking (Clark et al., 1999; Williams, Watts, MacLeod, & Mathews, 1997) en leiden ze tot negatieve gedachten, negatieve emoties en maladaptief gedrag (J. S. Beck, 1995). Beck gaat ervan uit dat psychische problemen van elkaar kunnen onderscheiden worden op basis van de cognitieve inhoud van de schema's waardoor ze worden aangestuurd ('cognitieve inhoudsspecificiteitshypothese', zie: A. T. Beck, 1976). Karakteristiek voor depressie zouden thema's als verlies, gemis en mislukking zijn. Gedragsproblemen zouden dan weer worden gekenmerkt door vijandige gedachten tegenover anderen en negatieve inschattingen van de intenties van

anderen. Eigen aan angst zouden gedachten over gevaar en kwetsbaarheid zijn en een pessimistische inschatting van de eigen mogelijkheden om met die kwetsbaarheid om te gaan (A. T. Beck et al., 1985).

Young (Young, 1999; Young & Klosko, 1994; Young, Klosko, & Weishaar, 2003) bouwde voort op Beck's ideeën en ontwikkelde een taxonomie van 18 maladaptieve schema's die onderling van elkaar verschillen qua cognitieve inhoud. Hij ontwikkelde ook een vragenlijst om deze schema's te meten, namelijk de Young Schema Questionnaire (YSQ: Young & Brown, 1990). Elk van de 18 disfunctionele schema's kan volgens hem worden ondergebracht in één van vijf schemadomeinen. Deze domeinen representeren algemeen menselijke behoeften of noden waaraan bij een kind dient te worden voldaan opdat het op een gezonde manier zou kunnen ontwikkelen. Wordt één van deze behoeften gefrustreerd, dan ontwikkelt zich mogelijk één van de maladaptieve schema's binnen het respectievelijke schemadomein. Young situeert de oorsprong van disfunctionele schema's in de kindertijd en de adolescentie, meer bepaald in de (maladaptieve) relatie die een kind of jongere met zijn ouders heeft. Young ontwikkelde eveneens een vragenlijst om die ouderlijke herkomst van schema's te meten, namelijk de Young Parenting Inventory (YPI: Young, 1994).

De meerwaarde van Young's schema theorie ten aanzien van Beck's traditionele cognitieve model, schuilt ons inziens in de verfijnde schema taxonomie en de aandacht die hij besteedt aan de (ouderlijke) context waarin schema's zich zouden ontwikkelen. We gaan er dan ook van uit dat empirisch onderzoek op basis van Young's denkkader ons meer inzicht kan verschaffen in cognitieve kwetsbaarheid, de oorsprong ervan en het verband met verschillende vormen van psychopathologie. Young's theorie heeft aanleiding gegeven tot tal van publicaties over maladaptieve schema's bij volwassenen met zeer uiteenlopende psychische problemen. In hoofdstuk 6 worden de belangrijkste onderzoeksbevindingen bij volwassenen op een rijtje gezet. Voor zover wij

weten, werden bij adolescenten tot dusver slechts vier empirische studies gerapporteerd waarin Young's cognitieve denkkader werd gehanteerd (Cooper, Rose, & Turner, 2005; Lumley & Harkness, 2007; Muris, 2006; Turner, Rose, & Cooper, 2005). **De globale doelstelling van deze verhandeling betreft dan ook het verder toetsen van de bruikbaarheid van Young's schema theorie om psychopathologie bij adolescenten te conceptualiseren.** Concreet worden de psychometrische kwaliteiten van de YSQ in een jongerenpopulatie onderzocht (hoofdstuk 5) en wordt nagegaan of er evidentie is voor de aanwezigheid van Young's maladaptieve schema's bij adolescenten en of deze (inhoudsspecifiek) geassocieerd zijn met psychopathologie (hoofdstuk 4-6). Tot slot zal aan de hand van de YPI gekeken worden of Young's assumpties over de ouderlijke origine van maladaptieve schema's empirisch kunnen worden ondersteund (hoofdstuk 7).

Vier empirische studies in deze verhandeling (hoofdstuk 2-5) spitsen zich toe op een specifieke populatie van adolescenten met psychische problemen, met name *obese*[1] jongeren. Obesitas is een medische conditie die verwijst naar een overmatige opstapeling van vetweefsel in het lichaam (Wabitsch, 2000). Wereldwijd is de prevalentie van obesitas gedurende de laatste decennia fors toegenomen, zowel bij volwassenen als bij kinderen en adolescenten (Jackson-Leach & Lobstein, 2006; Knai, Suhrcke, & Lobstein, 2007; Schokker, Visscher, Nooyens, van Baak, & Seidell, 2007; Wyatt, Winters, & Dubbert, 2006). Obese kinderen hebben een grote kans om later obese volwassenen te worden (Serdula et al., 1993). Obesitas in de volwassenheid gaat ontegensprekelijk gepaard met ernstige medische complicaties (Must et al., 1999), maar ook bij obese kinderen en jongeren kan er reeds sprake zijn van geassocieerde medische problemen (Must & Strauss, 1999). Bijgevolg is er een hoge maatschappelijke kost verbonden aan obesitas (Finkelstein, Fiebelkorn, &

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[1] In deze verhandeling worden, net als in de huidige onderzoeksliteratuur, de termen 'overgewicht' en 'obesitas' door elkaar gebruikt.

Wang, 2003; Wang & Dietz, 2002) en wordt de problematiek beschouwd als een belangrijke bedreiging voor de volksgezondheid. Obesitas ontstaat ten gevolge van een langdurig onevenwicht tussen energie-inname en energieverbruik. Dit onevenwicht komt tot stand door een zogenaamde gen-omgevingsinteractie (Bouchard, 1991). Er is duidelijk sprake van een multiple genetische kwetsbaarheid (Farooqi & O'Rahilly, 2007) die echter enkel tot uiting zal komen in een sedentaire omgeving van overvoeding (Maffeis, 2000).

De literatuur over geassocieerde psychische problemen bij obesitas toont erg inconsistente resultaten (zie bijvoorbeeld: Friedman & Brownell, 1995). Dit heeft sommige auteurs ertoe gebracht te stellen dat er geen empirische evidentie is voor een verhoogde prevalentie van psychische problemen bij mensen met obesitas. Zoals het literatuuroverzicht in hoofdstuk 2 uitwijst, is deze conclusie voorbarig. Eerst en vooral wordt het empirisch onderzoek naar psychopathologie bij obesitas gekenmerkt door enkele methodologische tekortkomingen, die het formuleren van goed onderbouwde conclusies voorlopig in de weg staan. Ten tweede blijkt dat in het bijzonder *obese jongeren die zich aanmelden voor behandeling* van overgewicht op psychisch vlak een kwetsbare populatie vormen. In deze subgroep wordt tevens een verband aangetoond tussen psychische problemen enerzijds en ongunstige familiale omstandigheden anderzijds (Decaluwe, Braet, Moens, & Van Vlierberghe, 2006; Epstein, Klein, & Wisniewski, 1994; Epstein, Myers, & Anderson, 1996; Zeller, Saelens, Roehrig, Kirk, & Daniels, 2004). Deze laatste bevindingen zetten de wijdverspreide idee dat psychische problemen bij obese jongeren enkel te wijten zijn aan sociale stigmatisering (Puhl & Brownell, 2001; Puhl & Latner, 2007), op de helling. Een bredere kijk op psychopathologie bij obese kinderen en jongeren lijkt dan ook aangewezen.

Gegeven de aandacht die Young schenkt aan de familiale origine van cognitieve kwetsbaarheid en dus van psychopathologie, hoeft onze keuze voor zijn schema theorie als potentieel breder kader om psychische problemen bij

obese jongeren te begrijpen, geen verwondering te wekken. Maar er is meer: zoals wordt uiteengezet in hoofdstuk 4 en 5, kreeg Young's cognitieve model recent veel aandacht binnen de eetstoornissenliteratuur bij volwassenen, ter verklaring van eetbuien bij patiënten met bulimia nervosa (BN) en binge eating disorder (BED) (zie bijvoorbeeld: Waller, 2003; Waller, Ohanian, Meyer, & Osman, 2000). In hoofdstuk 2 wordt aangetoond dat een substantieel aantal obese kinderen en jongeren óók reeds eetbuien rapporteert. We willen in deze verhandeling dan ook nagaan of Young's schema theorie mogelijkheden biedt om bij *obese* adolescenten psychopathologie in het algemeen (hoofdstuk 5) en eetpathologie in het bijzonder (hoofdstuk 4), in kaart te brengen. Rekening houdend met methodologische tekortkomingen uit eerder onderzoek, gaan we echter eerst en vooral na of jongeren die zich aanmelden voor obesitas behandeling op psychisch vlak inderdaad kwetsbaarder zijn dan adolescenten die zich niet aanmelden (hoofdstuk 2).

Er bestaan goede behandelingen voor obesitas bij kinderen en jongeren (Epstein, Myers, Raynor, & Saelens, 1998; Jelalian & Saelens, 1999; Jelalian, Wember, Bungeroth, & Birmaher, 2007), maar toch blijken die niet voor elk van hen even effectief (zie bijvoorbeeld: Braet, Tanghe, Decaluwe, Moens, & Rosseel, 2004). Men zou er van uit kunnen gaan dat net jongeren met comorbide psychische problemen in mindere mate van een standaard obesitas behandeling profiteren. In hoofdstuk 3 wordt stilgestaan bij de empirische evidentie voor deze hypothese. Ook hier zal blijken dat enkele methodologische tekortkomingen het formuleren van verantwoorde conclusies hieromtrent voorlopig in de weg staan. In onze empirische studie gerapporteerd in hoofdstuk 3, wordt getracht op een aantal van deze tekortkomingen een antwoord te bieden. We waren hierbij vooral ook geïnteresseerd in of de psychische problemen tijdens behandeling van obesitas vanzelf verdwijnen. Indien dit niet het geval zou zijn én als Young's schema theorie bruikbaar blijkt om emotionele en gedragsproblemen bij obese jongeren te begrijpen, bieden bepaalde

componenten uit Young's schema therapie (Young et al., 2003) mogelijk een aangrijpingspunt om tijdens obesitas behandeling met psychische moeilijkheden aan de slag te gaan.

Tot slot: gegeven de titel van het proefschrift en de opbouw van dit hoofdstuk zou men zich kunnen verbazen over het feit dat de empirische studies bij obese jongeren eerst behandeld worden. Wij beschouwen de volgorde van de studies zoals ze hier wordt gepresenteerd echter als een gradueel steeds strengere toetsing van Young's model. De studies over de bruikbaarheid van Young's model bij obese jongeren (hoofdstuk 4 en 5) zijn het meest exploratief van aard, daarom werden ze eerst uitgevoerd. De studies in hoofdstuk 2 en 3 gaan daar in onze ogen noodzakelijk en logisch aan vooraf (cf. infra). Hoofdstuk 6 en 7 vormen vervolgens een diepgaander en meer toegespitste toetsing van Young's theorie bij jongeren.

Hoofdstuk 2: Psychiatrische stoornissen en symptoomernst bij obese kinderen en jongeren die al dan niet behandeling zoeken voor overgewicht

Reeds in vele studies werd een mogelijke associatie tussen obesitas en psychopathologie onderzocht. De resultaten zijn echter weinig eenduidig. Volgens Friedman en Brownell (1995) heeft dit te maken met methodologische verschillen tussen studies enerzijds en met een grote heterogeniteit binnen de obese populatie anderzijds. Deze auteurs roepen dan ook op tot methodologisch sterk onderzoek naar risicofactoren voor psychopathologie *binnen* de obese populatie. Eén in dat opzicht relevant aspect lijkt klinische status. In een drietal studies werd aangetoond dat obese kinderen en jongeren die behandeling zoeken voor hun overgewicht méér psychopathologie vertonen dan obese kinderen en jongeren die geen behandeling zoeken (Braet, Mervielde, & Vandereycken, 1997; Britz et al., 2000; Erermis et al., 2004). Opvallend hierbij is dat (1) enkel in de studie van Britz et al. (2000) gebruik gemaakt werd van een gestructureerd klinisch interview, nochtans momenteel beschouwd als de 'gouden standaard'

voor diagnostiek van psychische *stoornissen* (Costello et al., 2005) en (2) in elk van de drie studies de klinische groep een significant hogere mate van overgewicht vertoonde dan de niet-klinische groep. Voorts vond men in volwassenenonderzoek bij obese vrouwen wél maar bij obese mannen géén evidentie voor een verband tussen klinische status en psychopathologie (Herpertz et al., 2006). Tot slot lijkt het belangrijk in onderzoek naar psychische comorbiditeit bij obese kinderen en jongeren expliciet de aandacht te vestigen op eetpathologie. Onderzoek heeft immers aangetoond dat obesitas in de kindertijd een risicofactor vormt voor de ontwikkeling van eetstoornissen in de volwassenheid (Fairburn & Harrison, 2003). Hoewel de prevalentie van 'full blown' eetstoornissen bij obese kinderen en jongeren laag is, rapporteert een substantieel aantal obese kinderen en adolescenten reeds zogenaamde subklinische eetpathologie, zoals lijngedrag of eetbuien (zie bijvoorbeeld: Decaluwe, Braet, & Fairburn, 2003; Tanofsky-Kraff et al., 2004).

Deze studie had als globaal doel na te gaan of obese kinderen en jongeren die behandeling zoeken voor overgewicht wat betreft de aanwezigheid van psychopathologie verschillen van obese kinderen en jongeren die geen behandeling zoeken. Meer specifiek werden de volgende hypothesen getoetst: *(1) Obese kinderen en jongeren die behandeling zoeken vertonen méér psychiatrische stoornissen en meer ernstige psychologische symptomen dan obese kinderen en adolescenten die geen behandeling zoeken; (2) Dit onderscheid blijft grotendeels behouden wanneer statistisch wordt gecontroleerd voor eventuele verschillen tussen beide groepen qua leeftijd, geslacht, socio-economische status (SES) of ernst van overgewicht; (3) Een aantal van laatstgenoemde demografische variabelen fungeren als moderatoren in de associatie tussen klinische status en de aanwezigheid van een psychiatrische diagnose.*

De proefgroep van deze studie bestond uit 115 obese jongeren die behandeling zochten voor hun overgewicht en 73 obese jongeren die geen

behandeling zochten voor hun overgewicht, alle tussen 8 en 18 jaar. Bij de jongeren werden de Children's Depression Inventory (CDI: Timbremont & Braet, 2002), Spence Children's Anxiety Scale (SCAS: Spence, 1998) en Youth Self Report (YSR: Verhulst, Van der Ende, & Koot, 1997) afgenomen. Aan de ouders werd gevraagd de Child Behavior Checklist (CBCL: Verhulst, Van der Ende, & Koot, 1996) in te vullen. Tenslotte werden alle kinderen en jongeren onderworpen aan twee gestructureerde klinische interviews: de Structured Clinical Interview for DSM-IV – Child version (KID-SCID: Dreessen, Stroux, & Weckx, 1998) en de Eating Disorder Examination – Child version (ChEDE: Bryant-Waugh, Cooper, Taylor, & Lask, 1996). Het eerste interview bedoelt DSM-IV (American Psychiatric Association, 1994) gedrags-, stemmings-, angst- en aanpassingsstoornissen te meten, het laatste interview is gericht op de diagnose van eetstoornissen zoals gedefinieerd in de DSM-IV. Met dit opzet wordt getracht tegemoet te komen aan enkele methodologische tekortkomingen van eerder onderzoek binnen dit domein (Braet et al., 1997; Britz et al., 2000; Erermis et al., 2004).

In de klinische groep voldeed 37.50% en in de niet-klinische groep 23.29% aan de criteria voor tenminste één DSM-IV diagnose. Klinische status was geassocieerd met een globaal hogere prevalentie van stoornissen. Bij kinderen en jongeren die behandeling zochten waren 'full blown' eetstoornissen, eetbuien en internaliserende symptomen méér prevalent dan bij kinderen en adolescenten die geen behandeling zochten. Klinische status was ook geassocieerd met een hogere mate van overgewicht en een lagere SES. Wanneer statistisch voor deze demografische verschillen werd gecontroleerd, verschilden beide groepen echter enkel nog voor internaliserende symptomen zoals gerapporteerd door de ouders. Leeftijd bleek in beide groepen positief geassocieerd met de aanwezigheid van een psychiatrische diagnose. In de niet-klinische groep was een hoge SES predictief voor de aanwezigheid van een stoornis.

De resultaten wijzen erop dat een substantieel aantal klinische én niet-klinische obese kinderen en jongeren te kampen heeft met psychiatrische stoornissen. Zowel vóór als na statistische controle voor mogelijk storende effecten van overgewicht en SES, waren de verschillen tussen beide groepen echter minder uitgesproken dan verwacht op basis van eerder onderzoek in dit domein. Hieraan koppelen we de hypothese dat, waar men vroeger vermoedde dat vooral de comorbiditeit van obesitas en psychopathologie leidde tot het zoeken naar hulp, in onze huidige samenleving obesitas *op zich* inherent stressvol is en voldoende reden tot aanmelden. Klinische groepen zullen bijgevolg gekenmerkt worden door een grotere heterogeniteit en klinische en niet-klinische groepen zullen qua psychologische comorbiditeit meer op elkaar lijken. Vanuit de vaststelling dat leeftijd predictief is voor de aanwezigheid van een psychiatrische diagnose schuiven we de hypothese naar voor dat 'obees-zijn' in de kindertijd een 'litteken' (kwetsbaarheid) kan vormen dat tot psychopathologie leidt bij confrontatie met stress. Conform het zogenaamde 'kwetsbaarheid-stress' psychopathologiemodel (Rutter, 2006) kan men, gegeven de tijdsgeest, uitgaan van een toename in psychologische problemen bij obese kinderen en jongeren gezien zowel een extra voedingsbodem voor kwetsbaarheden als hogere stressniveau's gecreëerd worden.

Hoofdstuk 3: Psychiatrische stoornissen, symptoomernst en gewichtsverlies tijdens residentiële obesitas behandeling bij adolescenten

Uit studie 1 bleek dat een substantieel aantal jongeren die behandeling zoeken voor overgewicht te kampen heeft met psychiatrische stoornissen. Onderzoek heeft aangetoond dat een standaardbehandeling voor obesitas (Goldfield, Raynor, & Epstein, 2002; Jelalian & Saelens, 1999; Jelalian et al., 2007) niet voor alle jongeren voldoende gewichtsverlies oplevert (zie bijvoorbeeld: Braet et al., 2004). Men zou zich kunnen afvragen in welke mate de aanwezigheid van ernstige vormen van psychopathologie in dat opzicht een

complicerende factor is. Psychologische *symptomen* lijken al bij al weinig invloed te hebben op gewichtsverlies bij obesitas behandeling (Braet, 2006; Braet & Van Winckel, 2000; Levine, Ringham, Kalarchian, Wisniewski, & Marcus, 2001), maar tot dusver bestaan er geen studies die het effect van psychiatrische *stoornissen*, gediagnosticeerd op basis van gestructureerde klinische interviews, op gewichtsverlies nagaan. Behandelingssucces mag niet alleen afgemeten worden aan gewichtsverlies maar dient ook het psychosociaal functioneren van de jongere aan het eind van de behandeling te evalueren (Jelalian & Saelens, 1999; Zametkin, Zoon, Klein, & Munson, 2004). Hoewel er evidentie is voor een daling van internaliserende en eetstoornissymptomen na behandeling voor overgewicht (Braet et al., 2004; Epstein, Paluch, Saelens, Ernst, & Wilfley, 2001; Levine et al., 2001; Myers, Raynor, & Epstein, 1998), is er voorlopig geen onderzoek beschikbaar over hoe psychiatrische stoornissen tijdens standaardbehandeling voor obesitas bij jongeren evolueren.

Deze studie had als globaal doel na te gaan wat bij obese adolescenten de impact is van psychopathologie op standaardbehandeling van overgewicht en vice versa. Meer specifiek werden de volgende hypothesen centraal gesteld: (*1*) *Psychische symptomen hebben weinig invloed, maar de aanwezigheid van een psychiatrische diagnose bemoeilijkt gewichtsverlies; (2) Obesitas behandeling leidt tot een daling van psychische symptomen, maar psychiatrische stoornissen verdwijnen niet.*

De proefgroep bestond uit 66 obese jongeren, alle tussen 12 en 18 jaar oud, aangemeld voor behandeling van overgewicht. Aan het begin van de behandeling werd de deelnemers gevraagd de YSR en de Eating Disorder Examination-Questionnaire (Fairburn & Beglin, 1994) in te vullen en, zoals in studie 1, werden ook de KID-SCID en de EDE afgenomen. Gewichtsverlies na één maand, na vier maanden en op het einde van de behandeling werden door een arts vastgesteld. Een subgroep van 31 jongeren vulde gedurende de laatste

week van hun verblijf nogmaals de YSR en de EDE-Q in en werd opnieuw geïnterviewd met de KID-SCID en de EDE.

Lineaire multiple regressieanalyses toonden aan dat de ernst van het overgewicht bij aanvang de sterkste predictor was van gewichtsverlies na één maand, na vier maanden en op het einde van de behandeling. Voor gewichtsverlies na vier maanden waren ook geslacht en de aanwezigheid van een psychiatrische diagnose goede predictoren: jongens en adolescenten zonder een psychiatrische diagnose toonden een groter gewichtsverlies. Via paired sample t-tests werd een daling vastgesteld van zorgen over eten, lichaam en gewicht en van het aantal gerapporteerde eetbuien. Een vergelijkbare trend was merkbaar voor internaliserende symptomen. Op het einde van de behandeling kampte 30.00% van de jongeren met een psychiatrische stoornis, waar dit bij aanvang van de behandeling voor 53.33% van de adolescenten het geval was. Deze daling kan quasi volledig worden toegeschreven aan het feit dat na afloop van de behandeling geen enkele jongere nog in aanmerking kwam voor een eetstoornisdiagnose, waar dit bij aanvang bij 20.00% van de deelnemers het geval was.

Op basis van deze resultaten concluderen we dat de aanwezigheid van een psychiatrische diagnose gewichtsverlies *in de loop van de behandeling* kan belemmeren. Mentale stoornissen hebben geen effect op initieel (na 1 maand) gewichtsverlies, noch op het totale gewichtsverlies aan het einde van de behandeling. Voor clinici zal het dus zaak zijn jongeren, in het bijzonder meisjes, met een ernstige vorm van psychopathologie te motiveren hun behandeling voort te zetten om een (nieuwe) faalervaring te vermijden. Op lange termijn is de prognose voor alle jongeren immers dezelfde: wie het zwaarste was, zal het meeste gewicht verliezen. Standaard obesitas behandeling heeft een gunstig effect op eetpathologie, inclusief eetstoornissen, en internaliserende symptomen. Echter, een substantieel aantal jongeren kampte na afloop van de behandeling nog steeds met tenminste één psychiatrische stoornis. Dit bevestigt

opnieuw de in hoofdstuk 1 besproken nood aan een breder kader om psychopathologie bij obese jongeren te begrijpen. Indien psychische problemen in deze groep enkel het gevolg zouden zijn van de aanwezigheid van obesitas (en de daaraan verbonden sociale stigmatisatie), zou men verwachten dat met het overgewicht ook de psychopathologie verdwijnt. Uit dit hoofdstuk blijkt echter dat dit niet noodzakelijk het geval is.

Hoofdstuk 4: Disfunctionele schema's en eetpathologie bij obese jongeren: Een 'case-control' studie

Recent werd in de literatuur over obesitas bij kinderen en jongeren veel aandacht besteed aan het concept 'controleverlies over eten' (LC). LC komt vaak voor in deze populatie en is positief geassocieerd met ernst van overgewicht, een laag zelfbeeld, negatief affect, cognities karakteristiek voor eetstoornissen (zorgen over eten, lichaam en gewicht) en lijngedrag (Decaluwe & Braet, 2003; Eddy et al., 2007; Glasofer et al., 2007; Goossens, Braet, & Decaluwe, 2007; Morgan et al., 2002; Tanofsky-Kraff, Faden, Yanovski, Wilfley, & Yanovski, 2005; Tanofsky-Kraff et al., 2004). Het lijkt er dus op dat LC bij obese jongeren een prevalent en klinisch belangrijk fenomeen is. De aanwezigheid van LC geldt momenteel als belangrijkste criterium om eetbuien te diagnosticeren bij kinderen en jongeren (Marcus & Kalarchian, 2003). In de eetstoornissenliteratuur werd door Waller en collega's de cognitieve theorie van Young (Young et al., 2003) geïntroduceerd als verklaringsmodel voor overeten bij bulimia nervosa (BN) en binge eating disorder (BED). Waller (2000) beschouwt eetbuien bij BN en BED als een copingmechanisme om om te gaan met negatieve emoties. De cognitieve theorie stelt dat dergelijke emoties en coping het gevolg zijn van de activatie van disfunctionele schema's (J. S. Beck, 1995). Cross-sectionele studies bij volwassenen bevestigen de aanwezigheid van maladaptieve schema's bij personen met eetstoornissen en een associatie tussen schema's en eetbuien (zie bijvoorbeeld: Waller, 2003; Waller et al., 2000). Empirisch onderzoek bij

jongeren heeft aangetoond dat disfunctionele schema's geassocieerd zijn met eetpathologie (Muris, 2006) en overgewicht (Turner et al., 2005). Tot slot suggereert onderzoek bij obese volwassenen dat disfunctionele schema's sterker aanwezig zijn bij individuen met een problematiek van eetbuien en geassocieerd zijn met depressie (Anderson, Rieger, & Caterson, 2006; Nauta, Hospers, Jansen, & Kok, 2000).

Globale doelstelling van deze studie bestond erin na te gaan of eetpathologie en negatief affect bij obese jongeren al dan niet geassocieerd zijn met de aanwezigheid van maladaptieve schema's. Concreet werden volgende hypothesen onderzocht: *(1) Obese adolescenten met LC rapporteren in sterkere mate maladaptieve schema's dan obese adolescenten zonder LC; (2) Bij obese jongeren is de aanwezigheid van disfunctionele schema's positief gecorreleerd met zorgen over eten, lichaam en gewicht, met lijngedrag en depressieve symptomen.*

In deze studie werd gewerkt met een 'case control design'. Elke jongere met LC werd gematcht met een jongere zonder LC op vlak van leeftijd, geslacht, klinische status en gewichtsklasse. Er namen in totaal 64 obese adolescenten tussen 12 en 18 jaar deel. De EDE werd afgenomen om LC, zorgen over eten, lichaam en gewicht en lijngedrag te meten, de YSQ om disfunctionele schema's na te gaan en de CDI om depressieve symptomatologie te meten.

Univariate variantieanalyses (ANOVA's) wezen uit dat obese jongeren met LC in sterkere mate disfunctionele schema's rapporteerden dan obese jongeren zonder LC. Pearson correlatiecoëfficiënten toonden een positief verband tussen maladaptieve schema's enerzijds, zorgen over eten en lichaam, lijngedrag en depressieve symptomen anderzijds.

De resultaten van dit onderzoek leveren preliminaire evidentie voor de bruikbaarheid van Young's schema theorie als een ruimer kader om bij obese jongeren psychopathologie in het algemeen en eetpathologie in het bijzonder te begrijpen. De bevindingen in deze studie lijken erop te wijzen dat er bij een

subgroep obese adolescenten sprake is van een complex samenspel van symptomen (LC, zorgen over eten en lichaam, lijngedrag, depressieve symptomen) waarbij disfunctionele schema's mogelijk een verklarende rol spelen. Deze bevindingen duiden op de mogelijke zinvolheid van het incorporeren van principes uit de cognitieve gedragstherapie en mogelijk zelfs de schemagerichte therapie in obesitas behandeling van een specifieke subgroep van adolescenten met overgewicht.

Hoofdstuk 5: Disfunctionele schema's en psychopathologie bij obese jongeren die behandeling zoeken voor overgewicht

In hoofdstuk 2 bleek dat een substantieel aantal obese jongeren dat zich aanmeldt voor behandeling van overgewicht kampt met psychische problemen. Hoofdstuk 3 toonde enerzijds aan dat tijdens obesitas behandeling bij jongeren de effecten van psychopathologie op gewichtsverlies miniem zijn. Anderzijds bleek echter dat bij een heel aantal jongeren psychopathologie doorheen behandeling blijft bestaan. Vanuit een bekommernis om de geestelijke gezondheid van deze jongeren, stelt zich de vraag hoe hun psychische moeilijkheden op een meer adequate manier kunnen worden aangepakt. Het is immers niet correct dat jongeren die zich aanmelden voor behandeling, zij het dan voor overgewicht, op het einde van de rit nog steeds significant lijden vertonen. Nogmaals: er is nood aan een omvattend model over psychopathologie dat niet alleen het onderzoek naar maar ook de behandeling van obese jongeren met comorbide psychische problemen kan sturen. Hoofdstuk 4 toonde aan dat Young's schema theorie in dat opzicht een valabele kandidaat is.

De globale doelstelling van deze studie betrof een verdere toetsing van de bruikbaarheid van Young's schema theorie om psychische symptomen bij obese jongeren die behandeling zoeken te verklaren. Concreet werden volgende hypothesen getoetst: *(1) Obese jongeren die behandeling zoeken voor hun overgewicht vertonen in sterkere mate disfunctionele schema's dan een*

controlegroep jongeren met een normaal gewicht; (2) Disfunctionele schema's verklaren een substantieel percentage van de variantie in internaliserende en externaliserende symptomen bij jongeren.

Aan dit onderzoek nam een klinische groep van 91 obese jongeren en een controlegroep van 91 jongeren met een normaal gewicht, alle tussen 12 en 18 jaar, deel. Zij vulden de YSQ en de YSR in. De ouders werd gevraagd de CBCL in te vullen.

Een multivariate variantieanalyse (MANOVA) toonde aan dat de obese jongeren in sterkere mate disfunctionele schema's rapporteerden dan de jongeren met een normaal gewicht. Multiple hiërarchische regressieanalyses in de hele proefgroep, waarbij gecontroleerd werd voor leeftijd, geslacht, SES en gewichtsstatus, toonden aan dat disfunctionele schema's een significant additioneel deel van de variantie in psychologische symptomatologie verklaren. Voor internaliserende problemen bedroeg de proportie variantie verklaard door de demografische variabelen en disfunctionele schema's samen ongeveer 45%, voor externaliserende problemen ging het om ongeveer 19%. Bovendien bleek dat alle subschalen van de YSQ als betrouwbaar konden worden beschouwd op vlak van interne consistentie: Cronbach alpha's voor de verschillende schema's varieerden tussen .65 en .86.

De resultaten van deze studie suggereren dat de schema theorie van Young mogelijk een vruchtbaar kader biedt om psychopathologie, in het bijzonder internaliserende problemen, in kaart te brengen bij jongeren in het algemeen en bij obese jongeren in het bijzonder.

Hoofdstuk 6: Disfunctionele schema's en psychopathologie tijdens de adolescentie: Over de bruikbaarheid van Young's schema theorie bij jongeren

Zoals reeds vermeld, heeft Young's cognitieve theorie over pychopathologie aanleiding gegeven tot tal van wetenschappelijke publicaties bij

volwassenen. In deze studies werden de psychometrische kwaliteiten van de YSQ onderzocht (zie bijvoorbeeld: Calvete, Estevez, de Arroyabe, & Ruiz, 2005; Hoffart et al., 2005; Lee, Taylor, & Dunn, 1999; Rijkeboer & van den Bergh, 2006; Schmidt, Joiner, Young, & Telch, 1995; Waller, Meyer, & Ohanian, 2001) en/of werd getracht de specifieke cognitieve inhoud bij verschillende vormen van psychopathologie in kaart te brengen (zie bijvoorbeeld: Brotchie, Meyer, Copello, Kidney, & Waller, 2004; Jovev & Jackson, 2004; Leung, Waller, & Thomas, 1999; Pinto-Gouveia, Castilho, Galhardo, & Cunha, 2006; Shah & Waller, 2000). Globaal genomen wordt de YSQ bij volwassenen beschouwd als een betrouwbaar en valide instrument om cognitieve kwetsbaarheid te meten en blijken de empirische bevindingen op basis van de YSQ te stroken met de belangrijkste assumpties uit de cognitieve theorie. Er blijft echter onduidelijkheid over de validiteit van de tweede orde factor structuur van de YSQ zoals Young deze theoretisch vooropstelde (vijf schemadomeinen) en over de houdbaarheid van de cognitieve inhoudsspecificiteitshypothese bij Young's schemataxonomie. Vanuit ontwikkelingspsychopathologisch standpunt zou het interessant zijn na te gaan in welke mate de empirische bevindingen bij volwassenen ook kunnen gerepliceerd worden bij adolescenten. Zoals aangegeven in hoofdstuk 1, werden bij adolescenten tot dusver slechts vier empirische studies gerapporteerd waarin Young's cognitieve denkkader werd gehanteerd (Cooper et al., 2005; Lumley & Harkness, 2007; Muris, 2006; Turner et al., 2005). Globaal genomen werd in deze studies evidentie gevonden voor de interne consistentie van de subschalen van de YSQ, bleek de YSQ te kunnen discrimineren tussen jongeren met en jongeren zonder (specifieke vormen van) psychopathologie en werden theoretisch betekenisvolle correlaties vastgesteld tussen aversieve (familiale) ervaringen, maladaptieve schema's en psychopathologie. Deze bevindingen, samen met die bekomen in hoofdstuk 4 en 5 zijn beloftevol, maar verder onderzoek ter bevestiging en uitbreiding van deze resultaten is noodzakelijk.

In dit hoofdstuk wordt over twee studies gerapporteerd. Globale doelstelling van de eerste studie betrof het onderzoeken van de factorstructuur van de YSQ bij jongeren. Concreet werden volgende hypothesen getoetst: *(1) De door Young theoretisch vooropgestelde eerste (15 schema's) en tweede (vijf schemadomeinen) orde factorstructuur kan bij adolescenten worden teruggevonden; (2) De subschalen van de YSQ zijn bij jongeren betrouwbaar in termen van interne consistentie.* Globale doelstelling van de tweede studie betrof het onderzoeken van de houdbaarheid in een adolescentenpopulatie van enkele belangrijke assumpties van de cognitieve theorie binnen Young's denkkader. Concreet werden volgende hypothesen getoetst: *(1) Er kan evidentie worden gevonden voor de dimensionaliteit van het schema concept, met andere woorden: jongeren die behandeling zoeken voor psychische problemen vertonen in sterkere mate disfunctionele schema's dan jongeren die geen behandeling zoeken; (2) Bij adolescenten wordt een correlatie gevonden tussen disfunctionele schema's enerzijds en internaliserende en externaliserende symptomen anderzijds en verklaren maladaptieve schema's een substantiële proportie van de variantie in symptomatologie; (3) Bij jongeren kan er evidentie worden gevonden voor cognitieve inhoudsspecificiteit in de associatie tussen specifieke maladaptieve schema's enerzijds en (symptomen van) angst, depressie en gedragsproblemen anderzijds.*

Aan deelstudie 1 nam een niet-klinische groep van 635 adolescenten tussen 12 en 18 jaar deel. Er werd hen gevraagd de YSQ in te vullen. In deelstudie 2 waren de participanten enerzijds 112 jongeren die op het moment van onderzoek niet en anderzijds 104 jongeren die op moment van onderzoek wel in behandeling waren voor psychische problemen, alle tussen 12 en 18 jaar oud. De jongeren die deelnamen aan deelstudie 2 vulden de YSQ en de YSR in en de KID-SCID werd bij hen afgenomen. Hun ouders werd gevraagd de CBCL in te vullen.

In deelstudie 1 werd de validiteit van de eerste orde 15-schema factorstructuur van de YSQ bij jongeren bevestigd via confirmatorische factoranalyse (CFA). De subschalen van de YSQ bleken ook betrouwbaar in termen van interne consistentie: Cronbach alpha's varieerden tussen .65 en .85. Wat de tweede orde factorstructuur betreft, kon op psychometrische grond weinig evidentie gevonden worden voor de superioriteit van één specifiek hogere ordemodel. De CFA's bevestigden de validiteit van alle getoetste tweede orde structuren. In deelstudie 2 toonde een MANCOVA met leeftijd als covariaat aan dat de klinische groep globaal genomen hogere scores behaalde op de YSQ dan de niet-klinische groep. Maladaptieve schema's bleken significant positief gecorreleerd met internaliserende en externaliserende psychopathologie. Samen verklaarden de 15 disfunctionele schema's ongeveer 26% van de variantie in internaliserende symptomen en 18% van de variantie in externaliserende symptomen. Er werd een hoge correlatie vastgesteld tussen schemadomeinen onderling, wat resulteerde in een grote proportie *gedeelde* verklaarde variantie in psychopathologie. Niettegenstaande werden onze hypothesen rond cognitieve inhoudsspecificiteit bij angst, depressie en gedragsproblemen grotendeels bevestigd.

De resultaten suggereren dat de eerste orde factorstructuur van de YSQ (15 schema's) zoals voorgesteld door Young ook in jongere populaties kan worden teruggevonden en dat de subschalen van de YSQ in deze populatie intern consistent zijn. Hoewel een hogere orde model met vijf factoren (schemadomeinen) het bij jongeren psychometrisch niet significant beter doet dan een tweede orde structuur met één, drie of vier hogere orde factoren, kan de factoriële validiteit ervan wel worden aangetoond. Vanuit theoretisch oogpunt lijkt het dan ook interessant deze vijf schemadomeinen als hogere orde structuur te behouden, wat, gegeven de resultaten, psychometrisch niet verkeerd is. Voorts werd de houdbaarheid bij jongeren van een aantal belangrijke assumpties van de cognitieve theorie op basis van Young's denkkader bevestigd. Deze bevindingen

bieden een verdere ondersteuning voor de bruikbaarheid van Young's model bij adolescenten.

Hoofdstuk 7: De ouderlijke oorsprong van disfunctionele schema's bij jongeren die aangemeld werden voor gedragsproblemen en comorbide depressieve symptomen vertonen

Verrassend genoeg stellen we in de volwassenenliteratuur een al bij al beperkte onderzoeksinteresse vast om op basis van Young's denkkader (inhoudsspecifieke) associaties tussen aversieve vroege familiale ervaringen enerzijds en cognitieve kwetsbaarheid en/of psychopathologie anderzijds te onderzoeken (zie bijvoorbeeld: Meyer & Gillings, 2004). Voor zover wij weten, is er op dit ogenblik slechts één studie waarin bij volwassenen op basis van de YPI en de YSQ de associatie tussen vroege ervaringen met de ouders en cognitieve kwetsbaarheid werd onderzocht (Sheffield, Waller, Emanuelli, Murray, & Meyer, 2005). In onderzoek bij jongere populaties lijkt de interesse voor de ouderlijke origine van Young's maladaptieve schema's groter (Lumley & Harkness, 2007; Muris, 2006; Turner et al., 2005), maar in nog geen enkele studie werd gebruikt gemaakt van de YPI. De 'traditionele' cognitieve inhoudsspecificiteitshypothese (A. T. Beck, 1976) gaat ervan uit dat thema's van verlies, gemis en mislukking karakteristiek zijn voor depressie. Men kan dus vermoeden dat in het bijzonder het YSQ schemadomein Disconnection/Rejection geassocieerd zal zijn met depressieve symptomatologie. Deze hypothese werd bevestigd in onderzoek bij volwassenen (Calvete et al., 2005) en in hoofdstuk 6 ook bij jongeren. Young veronderstelt inhoudsspecificiteit tussen een bepaald soort maladaptief ouderlijk gedrag enerzijds en het ontstaan van bepaalde maladaptieve schema's anderzijds. Gegeven dat de YPI en de YSQ volledig parallel werden geconstrueerd, kan men dus veronderstellen dat in het bijzonder het ouderlijk gedrag waarvan Young veronderstelt dat het gerelateerd is aan de ontwikkeling van schema's in het

domein Disconnection/Rejection karakteristiek zal zijn voor depressie. Theoretisch gezien is dit een wat alternatieve interpretatie van de inhoudsspecificiteitshypothese. Vanuit klinisch oogpunt lijkt het interessant deze assumptie te toetsen bij jongeren met gedragsproblemen. Gedragsstoornissen bij kinderen en jongeren zijn prevalent (Loeber & Hay, 1997) en kennen een hoge maatschappelijke kost (Scott, Knapp, Henderson, & Maughan, 2001). Behandeling voor gedragsproblemen blijkt niet steeds even effectief (Kazdin, 1987) maar de mechanismen die leiden tot behandelingssucces zijn vooralsnog onbekend (Burke, Loeber, & Birmaher, 2002). Hoewel weinig onderzocht, blijken comorbide depressieve symptomen behandeling van gedragsstoornissen te bemoeilijken (Loeber, Burke, Lahey, Winters, & Zera, 2000). Indien er bij jongeren met gedragsproblemen die comorbide depressieve symptomen vertonen, sprake zou zijn van een specifieke vorm van maladaptief ouderlijk gedrag, zouden interventies zich mogelijk daarop kunnen richten om zo de behandeling te optimaliseren.

De globale *theoretische* doelstelling van deze studie bestond erin de houdbaarheid van Young's ideeën over de ouderlijke origine van maladaptieve schema's na te gaan via een alternatieve toetsing van de inhoudsspecificiteitshypothese. Concreet werd de volgende hypothese onderzocht: *(1) Jongeren met gedragsproblemen die ook depressieve symptomen vertonen, zullen in sterkere mate maladaptieve ouderlijke gedragingen rapporteren die gerelateerd zijn aan maladaptieve schema's die behoren tot het Disconnection/Rejection schema domein (YPI); (2) Dit kan niet worden toegeschreven aan de aanwezigheid van gedragsproblemen of aan klinische status op zich.* De globale *klinische* doelstelling van deze studie bestond erin na te gaan of gedragsgestoorde jongeren met en zonder gedragsproblemen van elkaar kunnen worden onderscheiden op basis van de gepercipieerde relatie met hun ouders. De onderzochte hypothese kan dan als volgt worden vertaald: *(1) Jongeren met gedragsproblemen die ook depressieve symptomen vertonen,*

ervaren hun ouders als instabiel, koud, verwerpend en onvoorspelbaar; (2) Dit kan niet worden toegeschreven aan de aanwezigheid van gedragsproblemen of aan klinische status op zich.

In totaal namen 82 kinderen en adolescenten deel aan deze studie, alle tussen 8 en 18 jaar. Een groep van 41 kinderen en jongeren werd gerekruteerd via twee residentiële instellingen voor jongeren met ernstige gedragsproblemen (klinische groep), de andere werd gerekruteerd via scholen (niet-klinische groep). In de klinische groep werden de gedragsstoornissen- en depressiemodule van de KID-SCID afgenomen. In beide groepen vulden de kinderen en jongeren de CDI en de YPI over moeder (YPI-Mother) en over vader (YPI-Father) in. In de klinische groep werd iedere deelnemer met een diagnose 'huidige stemmingsstoornis' (KID-SCID) en/of depressieve symptomatologie (CDI-score hoger dan 13) ingedeeld in de 'klinische depressieve groep', de anderen in de 'klinische niet-depressieve groep'. In de niet-klinische groep werden kinderen en jongeren met een CDI-score groter of gelijk aan 13 uit de analyses verwijderd.

MANOVA's gaven aan dat, zowel voor de YPI-Mother als voor de YPI-Father de groepsverschillen zich enkel situeerden binnen ouderlijk gedrag gerelateerd aan maladaptieve schema's binnen het schemadomein Disconnection/Rejection. Meer bepaald behaalde de klinische depressieve groep een hogere score dan zowel de klinische niet-depressieve als de niet-klinische groep. Tussen de twee laatstgenoemde groepen werden geen verschillen vastgesteld. Uit MANOVA's met de YPI-Mother en YPI-Father subschalen behorende tot het domein Disconnection/Rejection als afhankelijke variabelen, bleken vervolgens groepsverschillen voor elk van de vier schema's behorende tot dit domein. Globaal genomen wezen post-hoc analyses uit dat de verschillen zich voornamelijk situeerden (1) tussen de klinische depressieve groep enerzijds en de klinische niet-depressieve en de niet-klinische groep anderzijds waarbij de laatste twee groepen niet van elkaar verschilden en (2) tussen de klinische depressieve groep enerzijds en de niet-klinische groep anderzijds waarbij de

klinische niet-depressieve groep van geen van de twee andere groepen verschilde.

Theoretisch gezien leveren de resultaten van deze studie evidentie voor Young's ideeën over de ouderlijke origine van disfunctionele schema's en bevestigen ze op een alternatieve manier de inhoudsspecificiteitshypothese. Globaal genomen bleek dat jongeren met gedragsproblemen en comorbide depressieve symptomatologie hun ouders als instabiel, koud, verwerpend en onvoorspelbaar ervaren en dat deze percepties van maladaptief ouderlijk gedrag niet toe te schrijven zijn aan de gedragsproblematiek of aan klinische status. Er dient weliswaar opgemerkt te worden dat deze studie géén rechtstreekse toetsing inhield van Young's assumptie over een inhoudsspecifieke associatie tussen maladaptief ouderlijk gedrag enerzijds en disfunctionele schema's anderzijds. Klinisch gezien zouden we ervan uit kunnen gaan dat de gedragsgestoorde jongeren met comorbide depressieve symptomen lijden aan een meer complexe vorm van psychopathologie die mogelijk zijn oorsprong vindt in specifiek maladaptief ouderlijk gedrag. Indien deze hypothese in verder onderzoek wordt bevestigd, lijkt het belangrijk deze gegevens in de bestaande behandelingen voor gedragsproblemen te incorporeren.

Hoofdstuk 8: Algemene discussie

In dit hoofdstuk worden de bevindingen van de verschillende studies met elkaar in verband gebracht en bediscussieerd. Er wordt stilgestaan bij de sterktes, beperkingen en klinische implicaties van het empirisch onderzoek en er wordt een aantal interessante ideeën voor nieuwe studies concreet uitgewerkt. In wat volgt besteden we vooral aandacht aan de belangrijkste bevindingen uit de verschillende studies en de methodologische sterktes en zwaktes van het onderzoek.

Doorheen de verschillende studies worden de psychometrische kwaliteiten van de YSQ bij jongeren bevestigd. De schema's en

schemadomeinen zoals gemeten met de YSQ geven blijk van een hoge interne consistentie (hoofdstuk 4-6) en de eerste (15 schema's) en tweede (vijf schemadomeinen) orde factorstructuur van de vragenlijst worden empirisch ondersteund (hoofdstuk 6). Er werd evidentie gevonden voor een positieve associatie van Young's maladaptieve schema's enerzijds en psychische problemen anderzijds, onafhankelijk van of psychopathologie categorisch (hoofdstuk 4,6) dan wel dimensioneel met 'brede band' (hoofdstuk 5-6) of 'smalle band' (hoofdstuk 4,6) vragenlijsten werd gemeten. Er werd aangetoond dat disfunctionele schema's een significante proportie van de variantie in symptomatologie verklaren (hoofdstuk 5-6) en er werd evidentie gevonden voor de cognitieve inhoudsspecificiteitshypothese (hoofdstuk 6-7). Tot slot werden Young's ideeën over de ouderlijke origine van schema's ondersteund (hoofdstuk 7). Globaal genomen staven al deze resultaten dus de bruikbaarheid van Young's schema theorie om psychopathologie bij jongeren te begrijpen.

Zoals aangegeven in hoofdstuk 1 hadden vier studies betrekking op een specifieke subgroep van jongeren met psychische problemen, namelijk obese jongeren. In hoofdstuk 2 werd bevestigd dat een substantieel aantal obese kinderen en jongeren (ernstige) psychische problemen vertoont. De verschillen tussen jongeren die wel en jongeren die geen behandeling voor overgewicht zoeken, waren echter minder uitgesproken dan verwacht op basis van de onderzoeksliteratuur. Wat betreft obesitas behandeling werd in hoofdstuk 3 aangetoond dat de aanwezigheid van een psychische stoornis predictief is voor gewichtsverlies na 4 maanden, maar niet voor initieel gewichtsverlies, noch voor gewichtsverlies op het einde van de behandeling. Wel bleek dat een substantieel aantal obese jongeren na obesitas behandeling nog steeds voldeed aan de criteria voor tenminste één psychische stoornis. Hoewel sommige van onze hypothesen in hoofdstuk 2 en 3 dus dienden te worden verworpen, bevestigen de bevindingen de nood aan een model als leidraad voor onderzoek naar en behandeling van emotionele en gedragsproblemen bij obese kinderen en

jongeren. In hoofdstuk 5 vonden we evidentie voor de aanwezigheid van disfunctionele schema's bij jongeren die zich aanmelden voor behandeling. In hoofdstuk 4 werd aangetoond dat maladaptieve schema's bij obese jongeren geassocieerd zijn met de aanwezigheid van eetpathologie en depressieve symptomen. Deze bevindingen leveren preliminaire evidentie voor de bruikbaarheid van Young's theorie om psychopathologie bij obese adolescenten te conceptualiseren.

Zoals in hoofdstuk 1 vermeld, biedt Young's theorie vanuit ontwikkelingspsychopathologisch standpunt een duidelijke meerwaarde ten aanzien van Beck's model, omwille van zijn concrete hypothesen over de herkomst van maladaptieve schema's. Toch durven we te stellen dat Young's model, dat net als dat van Beck in feite een psychopathologiemodel voor volwassenen is, mogelijk niet dynamisch genoeg is om de *ontwikkelingsgerelateerde aspecten* van cognitieve kwetsbaarheid goed te begrijpen. Als eerste aanzet tot een meer dynamisch cognitief model, bespreken we in hoofdstuk 8 dan ook de belangrijkste bevindingen van de verhandeling op basis van een algemeen ontwikkelingspsychopathologisch model dat recent werd vooropgesteld door Grant en collega's (2003). Tijdens deze discussie wordt ondermeer aangekaart dat Young's assumpties over de herkomst van schema's wellicht te erg toegespitst zijn op de ouderlijke relatie. Bij adolescenten dient voor wat betreft de ontwikkeling van cognitieve kwetsbaarheid wellicht ook de invloed van leeftijdgenoten en hun interacties met de ruimere omgeving in rekening te worden gebracht. Op basis van het model van Grant et al. (2003) worden tot slot ook een aantal interessante pistes voor verder ontwikkelingspsychopathologisch onderzoek naar maladaptieve schema's geformuleerd.

De belangrijkste beperking van het empirisch onderzoek naar cognitieve kwetsbaarheid in deze verhandeling is dat nergens een longitudinaal opzet werd gebruikt. De cognitieve theorie gaat uit van specifieke temporele verbanden

tussen familiale relaties, maladaptieve schema's en psychopathologie, waarover op basis van onze cross-sectionele studies geen enkele uitspraak kan worden gedaan. Een andere belangrijke beperking is dat, behalve in hoofdstuk 7, nergens rekening werd gehouden met comorbiditeit (zie bijvoorbeeld: Ford et al., 2003) van psychische problemen. Zeker met betrekking tot de toetsing van de inhoudsspecificiteitshypothese beperkt dit onze conclusies. Een sterkte van het onderzoek is dat in vele studies gebruik werd gemaakt van de 'gouden standaard' voor het meten van psychopathologie, met name een 'multi-method multi-informant' benadering (Achenbach, Mcconaughy, & Howell, 1987; Costello et al., 2005). Voor het meten van cognitieve kwetsbaarheid (YSQ) en de ouderlijke origine van schema's (YPI) werden echter enkel zelfrapportage vragenlijsten afgenomen. In toekomstig onderzoek is het gebruik van zogenaamde 'performance based measures' voor het meten van cognitieve kwetsbaarheid (zie bijvoorbeeld: Frick, 2000; Frick & Loney, 2000; Garber & Kaminski, 2000) en stress (zie bijvoorbeeld: Jacquez, Cole, & Searle, 2004; Prinstein & Aikins, 2004) aangewezen om de bekomen resultaten te valideren. Tot slot moeten we ons goed realiseren dat het toepassen van een theoretisch psychopathologiemodel (voor volwassenen) een zogenaamde 'top-down benadering' impliceert. Het is niet omdat jongeren Young's schema taxonomie herkennen dat deze ook representatief is voor de manier waarop zij *spontaan* over zichzelf, over hun relaties met anderen en over de wereld om hen heen denken en spreken.

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Tabellen

Tabel 1. *Overzicht van de datasets opgenomen in de verschillende empirische studies*

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1. **Klinisch obese jongeren** (12-18 jaar) gerekruteerd via een behandelingsprogramma voor overgewicht (juli 2004; **n=34**)

2. **Klinisch obese kinderen en jongeren** (8-18 jaar) gerekruteerd via een behandelingsprogramma voor overgewicht (januari 2005; **n=29**)

3. **Klinisch obese jongeren** (14-18 jaar) gerekruteerd via een behandelingsprogramma voor overgewicht (juli 2005; **n=31**)

4. **Klinisch obese jongeren** (8-18 jaar) gerekruteerd via een behandelingsprogramma voor overgewicht (januari 2006; **n=18**)

5. **Klinisch obese kinderen en jongeren** (8-18 jaar) gerekruteerd via een behandelingsprogramma voor overgewicht (juli 2006; **n=41**)

6. **Niet-klinisch obese kinderen en jongeren** (8-18 jaar) gerekruteerd via gezondheidsmagazines **(n=36)**

7. **Niet-klinisch obese jongeren** (12-18 jaar) gerekruteerd via middelbare scholen **(n=41)**

8. **Niet-klinische jongeren** (12-18 jaar) gerekruteerd via middelbare scholen **(n=479)**

9. **Niet-klinische jongeren** (12-18 jaar) gerekruteerd via studenten 3de Bachelor Psychologie **(n=298)**

10. **Klinische jongeren** (12-18 jaar) gerekruteerd via residentiële behandelingscentra voor jongeren met emotionele en/of gedragsproblemen **(n=55)**

11. **Klinische jongeren** (12-18 jaar) gerekruteerd via ambulante behandelingscentra voor jongeren met emotionele en/of gedragsproblemen **(n=50)**

12. **Klinische kinderen en jongeren** (8-18 jaar) gerekruteerd via twee residentiële instellingen voor behandeling van kinderen en jongeren met gedragsproblemen **(n=45)**

13. **Niet-klinische kinderen en jongeren** (8-18 jaar) gerekruteerd via lagere en middelbare scholen **(n=58)**