Difficulties in emotion regulation and internalizing symptoms in Swedish youth

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Abstract

Psychological research has in the last few decades moved away from viewing psychopathology as distinct categories towards a hierarchical, dimensional model where an empirically based structure reflects the similarities among disorders. New tools, such as the second version of The Inventory of Depression and Anxiety Symptoms (IDAS-II) have been developed to capture this dimensionality. In this time period there has also been a considerable development of research on emotion regulation, and emotion dysregulation has been proposed as a possibly unifying factor that could explain a wide range of psychopathological difficulties. This study explored the relationship between difficulties in emotion regulation and four symptom dimensions – dysphoria, ill temper, social anxiety and panic – from the IDAS-II in a sample of 633 Swedish children and adolescents aged 10-19 years. The results showed that difficulties in emotion regulation were statistically significantly associated with each of the symptom dimensions. Dysphoria, that captures core emotional and cognitive symptoms of depression and anxiety, had a stronger association with emotion regulation than the other symptom dimensions. These findings indicate that difficulties in emotion regulation are most strongly linked to broad psychopathology in youth, but less clearly linked to more specific symptom dimensions.

Keywords: emotion regulation, IDAS-II, DERS-16, HiTOP, children, adolescents

Sammanfattning

Psykologisk forskning har under de senaste årtiondena rört sig bort från att se psykopatologi som distinkta diagnostiska kategorier och istället rört sig mot en hierarkisk, dimensionell modell där en empiriskt grundad struktur bygger på gemensamma faktorer mellan psykiatriska syndrom. Nya verktyg, som den andra versionen av The Inventory of Depression and Anxiety Symptoms (IDAS-II), har utvecklats för att fånga dimensionaliteten i psykopatologi. Under den här tidsperioden har forskning på emotionsreglering också utvecklats mycket och emotionsdysreglering har föreslagits som en möjlig underliggande faktor som kan förklara många olika former av psykopatologi. Den här studien undersökte relationen mellan svårigheter i emotionsreglering och fyra symptomdimensioner från IDAS-II – dysfori, irritabilitet, social ångest och paniksymtom – hos 633 svenska barn och ungdomar i åldern 10 till 19 år. Resultaten visade att svårigheter i emotionsreglering och dessa symtomdimensioner var statistiskt signifikant associerade. Dysfori, som fångar generellt dåligt psykiskt mående i form av emotionella och kognitiva symtom kopplade till depression och ångest, hade en starkare koppling till emotionsreglering än de andra tre symptomdimensionerna. Resultaten indikerar att svårigheter med emotionsreglering är tydligast kopplade till breda psykopatologiska problem hos unga, men mindre tydligt kopplade till mer specifika symptomdimensioner.

Nyckelord: emotionsreglering, IDAS-II, DERS-16, HiTOP, barn, ungdomar

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While chronic physical disorders have a conditional risk increasing with age, mental disorders have been shown to more commonly onset in adolescence or in young adulthood and, for many disorders, in a rather narrow timespan with the risk decreasing among people who have matured out of the high-risk age range (Kessler et al., 2005). In about 50% of individuals with any mental disorder the onset of the disorder was before age 18 (Caspi et al., 2020; Solmi et al., 2022), and the peak and median age of onset of mental disorders is 14.5 years and 18 years respectively (Solmi et al., 2022).

Thus, it is problematic that most of the research on psychopathology has been done with adult samples and that there is a subsequent lack of research on youth populations. This is particularly true when it comes to emotion regulation, even though evidence suggests that increased focus on emotion regulation can improve existing interventions (Moltrecht et al., 2021). It is also problematic that most research in the past has been done on distinct categories of psychopathology, while accumulating evidence supports dimensional models of psychopathology (Conway et al., 2019; Kotov et al., 2017; Watson et al., 2012).

The Hierarchical Taxonomy of Psychopathology, HiTOP

The Hierarchical Taxonomy of Psychopathology (HiTOP) started in 2015 as a project to develop a fully empirical, quantitative, model of psychopathology in order to rectify some of the issues with the traditional view that mental disorders can be ordered into discrete categories (Kotov et al., 2017; Kotov et al., 2021). The HiTOP movement identifies five major issues with categorical nosologies (Kotov et al., 2017; Kotov et al., 2021). First, there is currently no evidence to support a categorical view of mental health, whilst on the other hand there is evidence to support a dimensional view with no sharp distinction between pathology and normality (Krueger et al., 2018). The second issue is a lack of diagnostic reliability, which leads to instability both over time and between disorders (Kotov et al., 2021). A third issue is that comorbidity (i.e., that an individual meet criterion for several disorders) is very common despite that the traditional nosology views disorders as discrete syndromes (Kotov et al., 2021). Fourth, there is an issue with heterogeneity within diagnoses where the individual symptoms can be unrelated to each other. Fifth, there is the issue that many people can experience significant distress despite not meeting diagnostic criteria for any disorder. Although some steps have been taken in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorder*s (5th ed.; *DSM-5*; American Psychiatric Association, 2013) and the *International Classification of*

*Diseases and Related Health Problems (*11th ed.; *ICD-11;* World Health Organization, 2019) to introduce dimensionality into the nosological systems, most disorders are still based on strict categories (Kotov et al., 2021).

HiTOP differs from traditional nosologies in that it seeks to organize mental health not based on the consensus of experts, as in DSM, but on an empirical quantitative analysis of symptoms and their relations to one another (Kotov et al., 2017; Krueger et al., 2018). This results in a more bottom-up approach starting from individual symptoms and, through statistical correlation, grouping of symptoms into subfactors, such as Distress, Fear or Antisocial Behavior, which in turn can be grouped into broader spectra, such as the Internalizing or Disinhibited Externalizing dimensions (Kotov et al., 2017). This system differs from traditional systems such as DSM and ICD which start with diagnostic categories and try to find the symptoms that define them.

The quantitative approach of HiTOP resolves all the aforementioned issues of categorical taxonomies (Krueger et al., 2018). Since it is dimensional there are no arbitrary boundaries for what is considered healthy and not. Thus, all patients can be described using this system since they do not have to meet a prespecified number of criteria but can be described alongside different empirically supported symptom dimensions (Kotov et al., 2017). Further, the HiTOP dimensions have high test-retest reliability (Kotov et al., 2021). Last, since the taxonomy of HiTOP is built from the bottom up using statistical correlations between symptoms and is structured hierarchically it reduces the issue of comorbidity and the heterogeneity within diagnoses (Kotov et al., 2017).

The Inventory of Depression and Anxiety Symptoms, IDAS

One example of the issues related to categorical taxonomies is that traditional self-report measures of depression, such as the Beck Depression Inventory-II and the Center for Epidemiological Studies Depression Scale (CES–D), are strongly associated with anxiety symptoms (Watson, 2005). This results in lack of discriminant validity and shows the need for an instrument which includes measures of both depression and anxiety (Watson et al., 2007). Further, other measures include several items for one criteria of depression but only one or none for other criteria (Watson et al., 2007). This limits the applicability of the instruments and might cause them to miss certain types of depression. The third issue is similar to the second in that these older measures provide an overall score of depression, which might be sufficient in some

circumstances, but tend to ignore the multidimensional nature of depression and therefore might overlook certain subtypes (Watson et al., 2007).

The Inventory of Depression and Anxiety Symptoms, IDAS, was designed to complement these more traditionally categorical self-report measures by the creation of multiple scales assessing specific symptoms of depression, while also separating anxiety-related symptom dimensions from symptom dimensions related to depression. Such an instrument would allow for an examination of the relationship between the two and thus increase the discriminant validity (Watson et al., 2007). IDAS also includes multiple items for each criterion of major depression in the *Diagnostic and Statistical Manual of Mental Health Disorders* (4th ed.; *DSM-IV*, American Psychiatric Association, 2000) trying to measure different aspects of each criterion. In the development of the subscales of IDAS, Watson et al. (2007) made sure to include sufficient markers in rationally organized homogenous item composites, HICs. This way each dimension was given a reasonable chance to emerge in statistical analysis, and as the dimensions that did not emerge were dropped, 20 HICs resulted in 11 dimensional scales. This allowed the instrument to achieve good internal validity, internal consistency and good convergent and discriminant validity compared to other self-report measures (Watson et al., 2007).

The development of IDAS resulted in 11 nonoverlapping, factor analytically derived scales, separating five specific dimensions of major depression (Suicidality, Lassitude, Insomnia, Appetite Loss, Appetite Gain) from three specific types of anxiety symptoms (Panic, Social Anxiety and Traumatic Intrusions). Two more symptom scales, Ill Temper and Well Being, represent symptoms related to depression not covered by the *DSM-IV* major depression category. The last of these 11 scales, Dysphoria, represents a broad factor that was created to capture core emotional and cognitive symptoms of depression and anxiety. It includes items assessing general distress in the forms of depressed mood, anhedonia, worry, worthlessness, guilt, hopelessness, psychomotor disturbance and cognitive difficulties. An additional scale, the General Depression scale, was created to comprehensively capture depression and provide an overall score more similar to traditional measures. The General Depression scale is a composite of all ten items from the Dysphoria scale and two items from each of the other five scales that measure depressive symptoms (Watson et al., 2007). Interestingly, the expected two-factor structure of internalizing symptoms (depression and anxiety) was not found in the original IDAS. Instead, a single general factor emerged, accounting for 85.9% - 95.4% of the common

variance. The Dysphoria scale loaded between .89 and .93 on this factor, suggesting that Dysphoria was largely equivalent to the general factor underlying IDAS (Watson et al., 2007).

The IDAS-II is an expanded version of the original IDAS in which five new anxiety scales (Traumatic Avoidance, Checking, Ordering, Cleaning, Claustrophobia) and two new scales relevant to bipolar disorder (Mania, Euphoria) were added (Watson et al., 2012). While still not comprehensive, the IDAS-II was constructed to be a diagnostic tool that provides broad coverage of the symptom dimensions that underlie major depression, bipolar disorders, PTSD, agoraphobia, social phobia, specific phobias and obsessive-compulsive disorder, OCD. It showed both high internal consistency and good convergent, discriminant, and criterion validity compared to similar traditional measures of depression, anxiety and mania (Watson et al., 2012). The new scales tended to be less related to Dysphoria than the original scales and in IDAS-II, a general factor only accounted for 72.6% - 79.1% of the common variance, suggesting the possibility of identifying additional dimensions, and a possible three factor structure included Distress (largely defined by Dysphoria), Obsessions/Fear and Positive mood (Nelson et al., 2018; Watson et al., 2012).

With the purpose of facilitating clinical use of the IDAS-II, Nelson et al. (2018) developed normative data from a community/Mechanical Turk sample. They found that age was inversely associated with internalizing symptoms. Women scored significantly higher than men on the General Depression composite scale and the Lassitude scale and significantly lower on the Euphoria scale. Notably, no gender differences emerged on the other IDAS-II scales. The IDAS-II scales have been shown to be good to excellent predictors of their corresponding Structured Clinical Interview for *DSM-IV* diagnoses, and for *DSM-5* criteria using the Mini-International Neuropsychiatric Interview (Stasik-O'Brien et al., 2019; Watson et al., 2012). The 10-item Dysphoria scale and the 20-item General Depression scale have demonstrated strong abilities to predict internalizing diagnoses and thus may represent an efficient way to screen for internalizing psychopathology (Stasik-O'Brien et al., 2019).

Emotion and emotion regulation

In order to discuss the construct and measurement of difficulties in emotion regulation, we will first attempt to convey the complexity of the field of research on emotion regulation and to define the concepts of emotion, emotion regulation and emotion dysregulation. We take the cue from Gross (2015), who points out that conceptual heterogeneity in this field makes it necessary to clarify how one intends to use the terms.

According to Beckes and Edwards (2020), researchers increasingly agree that emotions function to guide behavior, but not all researchers agree on the manner in which this occurs. There are arguments for some emotions being basic, or natural kinds. Basic emotions are considered domain-specific functions of the brain presumed to have developed through evolution across species, for example motivating approach, avoidance and affiliative behaviors, which presumably have increased likelihood of survival (Beauchaine & Haines, 2020). There are also a number of theories arguing that human emotions are dynamic processes that are developed through individual learning and function to motivate behavior beyond evolution or physical survival, and with a strong focus on regulating social behavior (Beckes & Edwards, 2020; Nelson et al., 2020). Gross (2015) points out that there are, across many different approaches to describing emotions, three key points of agreement: 1) emotions are loosely coupled changes in subjective experience, physiological arousal and behavior, 2) emotions unfold over time and are time limited, 3) emotions can be either helpful or harmful, depending on the context.

Given the complexity of different approaches to emotion it is not surprising that the concept of emotion regulation is no closer to one universal, generally agreed upon, definition. Thompson (1994) offers the definition of emotion regulation as "the extrinsic and intrinsic processes responsible for monitoring, evaluating and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals". Based on Gross' (2015) definition of emotions as time-limited, situationally bound and valanced (positive or negative) states, emotion regulation can be seen as any process that aims to influence the situation that generates the emotion as well as the quality, intensity or duration of the emotional experience. Emotion regulation does not only refer to the downregulation of negative emotions such as fear and anxiety (i.e., calming down) but encompasses all regulation of emotion that is adaptive to the given situation (McRae & Gross, 2020). Thus, goal-oriented up-regulation of both negative and positive emotions, such as anger and joy, can also be considered successful emotion regulation. Emotion regulation can be both intrinsic and extrinsic. The latter refers to regulating the emotion of others, like a parent soothing a child or a teacher calming a group of students.

Emotion regulation strategies

There is a broad variation of means by which humans achieve emotion regulation. Focusing on one's breathing, having a drink, talking to a friend and listening to music are only a few examples. That is why much of the research in this field, which according to Gross (2015)

has exploded since it emerged as a distinct field in the 1990's, has been aimed at organizing and assessing strategies for emotion regulation. One example of emotion regulation theory is the process model in which emotion is considered to be generated in either of four stages: situation, attention, appraisal and response (Gross, 2015). Emotion regulation strategies are then sorted into five groups depending on where the individual engages in emotion regulation: situation selection (before the first stage), situation modification, attentional deployment, cognitive change and response modulation. The process of selecting, implementing and monitoring strategies for emotion regulation is viewed as ongoing in constantly iterating circles.

A study on emotion regulation in adolescents (N=271, 12-18 years) used the Cognitive Emotion Regulation Questionnaire, CERQ, that measures nine different cognitive strategies: self-blame, other-blame, rumination or focus on thought, catastrophizing, putting into perspective, positive refocusing, positive reappraisal, acceptance and planning (Garnefski et al., 2005). The study examined relationships between separate cognitive strategies, as measured with CERQ, and internalizing and externalizing problems. Results showed that adolescents with internalizing problems scored significantly higher on the strategies of self-blame and rumination. Strategies for emotion regulation have also been understood in terms of adaptive and maladaptive strategies. One example is found in a study where a self-report measure named FEEL-KJ was used to differentiate between seven adaptive (problem solving, distraction, forgetting, acceptance, humor enhancement, cognitive problem solving and reevaluation) and five maladaptive (giving up, withdrawal, rumination, self-devaluation and aggressive actions) emotion regulation strategies (Cracco et al., 2017). In a representative sample of Dutch youth aged 8-18 years (N=1397), the study found support for a normative shift in ages 12-15, with a decrease in use of adaptive strategies and an increase in use of maladaptive strategies.

To further illustrate the heterogeneity of constructs and measures of emotion regulation strategies, another self-report instrument for adolescents, the Adolescents' Emotion Regulation Strategies Questionnaire, AERSQ, was developed in a study of Swedish adolescents (Zhou et al., 2020). The authors argued that available self-report emotion regulation instruments usually require elaborate forms of cognitive reasoning about the internal sequences of cognitions and emotions, and the authors set out to develop a questionnaire better suited for adolescents. They found that adolescents' commonly used emotion regulation strategies sorted into five factors in the AERSQ: rumination/negative thinking, positive reorientation, communication, distraction and cultural activities. Rumination/negative thinking was found to have the strongest

relationship with mental health problems such as self-harm, depression and anxiety. In short, these studies are examples of efforts to organize and assess emotion regulation strategies in adolescents and associate these strategies with different aspects of psychopathology in youth (Garnefski et al., 2005; Cracco et al., 2017; Zhou et al., 2020). However, we have found no generally agreed upon construct or measure of emotion regulation strategies.

Emotion dysregulation

Emotion dysregulation refers to difficulties related to emotional states or to influencing these states in a desired way. Most forms of psychopathology are characterized by negative emotional experiences that are either too intense or too protracted to be adaptive (Beauchaine, 2001). In the introduction chapter of *The Oxford Handbook of Emotion Dysregulation* (2020), editors Beauchaine and Crowell encourage the use of a definition of emotion dysregulation as "a pattern of emotional experience and/or expression that interferes with appropriate goal-directed behavior". The use of "appropriate" rather than "adaptive" aims at broadening the concept to fit different approaches to describing emotion as discussed above, and include not only functionally adaptive or motivated behaviors, but also whether the expression of a specific emotion or the intensity with which it is expressed, is considered appropriate in the given social or cultural context.

In the chapter on self-report assessment in *The Oxford Handbook of Emotion Dysregulation* (2020), Gratz et al. (2020) further describe how the concept of emotion dysregulation is mainly used in one of two ways in the literature. The first conceptualization refers to a temperamental emotional vulnerability. In this use of the concept, the above average temperamental sensitivity to emotional stimuli, as well as intensity, longevity and lability of emotion, is seen as inherently dysregulated. The other conceptualization separates the quality of the emotional responses themselves from maladaptive ways of responding to emotions.

Gratz et al. (2020) acknowledge that both these conceptualizations have been shown, through related self-report measures, to be relevant to the presence and severity of psychopathology and may inform our understanding of normal and abnormal development. They argue, however, that there is limited research suggesting that emotion-related traits are directly relevant to development of psychopathology in the absence of other risk or vulnerability factors, or that they change following treatment. Maladaptive responses to emotions, on the other hand, are learned behaviors that can more readily be changed or relearned. The conceptualization of emotion dysregulation as maladaptive responses is

therefore argued to be better suited to measure change achieved through different methods of treatment.

The Difficulties in Emotion Regulation Scale, DERS

As the concept of emotion regulation grew to be understood as a potentially unifying function of diverse symptom presentations and maladaptive behaviors, Gratz and Roemer (2004) proposed an integrative conceptualization of emotion regulation. Based on research by for example Steven C. Hayes (Hayes et al., 1996) and Marsha M. Linehan (Linehan, 1993), they argue that emotion regulation is not about being able to modulate and control emotional experiences or expressions as much as being able to understand and accept emotions, and to act in a desired way despite emotional arousal. With the purpose of constructing a measure that accounts for clinically relevant difficulties regarding these different aspects of emotion regulation, Gratz and Roemer developed the Difficulties in Emotion Regulation Scale, DERS. The DERS items were selected to reflect difficulties within four dimensions of emotion regulation: a) awareness and understanding of emotions, b) acceptance of emotions, c) the ability to engage in goal-directed behavior, and to refrain from impulsive behavior, when experiencing negative emotions, and d) access to emotion regulation strategies perceived as effective.

Factor analysis of the DERS resulted in six, rather than four, different factors with adequate internal consistency (Cronbach's α>.80) for each of the subscales. The dimension of awareness and understanding formed two different, but related, subscales. One consisted of items reflecting the tendency to attend to and acknowledge emotions (AWARENESS) and the other of items reflecting the extent to which individuals know and are clear about the emotions they are experiencing (CLARITY). The dimension of goal-directed behavior and refraining from impulsive behavior was also split into two subscales. One consisted of items reflecting difficulties concentrating and accomplishing tasks when experiencing negative emotions (GOALS) and the other of items reflecting difficulties in remaining in control of one's behavior when experiencing negative emotions (IMPULSE). Thus, one can have difficulties with one part of this dimension without having difficulties with the other part. The remaining two subscales mapped onto the originally proposed dimensions. The dimension of acceptance of emotions formed a subscale with items reflecting the tendency to have negative secondary emotional responses to one's negative emotions (NONACCEPTANCE), and the dimension of access to effective emotion regulation strategies formed a subscale with items reflecting the

belief that there is little that can be done, once already upset (STRATEGIES). The items in DERS focus on difficulties to regulate negative emotion (for example there are many items constructed with "When I am upset…) and are scored so that the overall scores, as well as the subscale scores, reflect greater difficulties.

The original 36 item version of DERS is widely used and has extensive psychometrical support (Gratz et al., 2020). The clinical and research utility of the measure has resulted in the development of other versions of DERS, like state-based DERS (S-DERS) and the positive emotion specific DERS (DERS-positive). A number of brief versions has also been developed, among them DERS-16 (Bjureberg et al., 2016), a brief version with 16 items that we will describe below.

DERS is a self-report measure, developed for adults. One of the most commonly noted problems with self-report measures of internal states, like emotions, is that they rely on an individual's ability to recognize and accurately report on these states (Gratz et al., 2020). However, difficulties in emotion regulation are, by virtue of the nature of the construct itself, well suited to be measured by self-report. This is because a person can be aware of difficulties related to emotion and emotional states without being able to recognize or label these emotions. For example, to answer the questions in DERS, a person does not need to be able to describe or name their feelings, but only to show awareness of struggling with, judging, disliking or avoiding their feelings. Similarly, a person can experience emotions as unclear, intense, out of control or overwhelming, or be aware of a state of arousal, discomfort or distress, without recognizing or labeling these emotions or states. Furthermore, there is no need to define strategies for emotion regulation, or how and when they are used, because the respondent only needs to know if, when they are upset, they feel that something can be done about it or not. In short, DERS does not require a great ability for cognitive reasoning about emotion or emotion regulation, making the scale favorable when conducting research with children and adolescents, who may have a harder time recognizing and reporting on internal processes.

Relevance of difficulties in emotion regulation for psychopathology

Gratz et al. (2020) present a comprehensive summary of studies that have used DERS as a measure of emotion regulation and linking it to various forms of psychopathology and related traits and behaviors. Difficulties in emotion regulation measured via DERS have been shown to be associated with maladaptive behaviors thought to serve an emotion-regulation function, for example self-harm, binge-eating and substance use. Heightened scores on DERS

have been found among individuals with borderline personality disorder (BPD), post-traumatic stress disorder (PTSD), eating disorders and social anxiety disorder, all of which are psychiatric disorders thought to be characterized by emotion dysregulation. Other studies have found associations between difficulties in emotion regulation and severity of symptoms of depression, anxiety and anorexia nervosa, and there are also studies on associations with other possibly related constructs such as positive associations with negative affect, distress tolerance, experiential avoidance and others. Also, a number of studies have associated difficulties in emotion regulation with objective behavioral, neurological and physiological measures of emotion dysregulation (see Gratz et al., 2020 for more information).

Gratz et al. (2020) also provide examples of studies of treatment methods where difficulties in emotion regulation measured via DERS has been used as an outcome variable. Studies on women with self-injury and BPD have shown significant improvements in DERS following a brief acceptance-based emotion regulation group therapy. One such example is a Swedish study by Sahlin et al. (2017), where 95 women with BPD and self-harm received a 14-week long emotion regulation group treatment. The group showed significant improvement on the primary outcome of self-harm frequency, as well as on secondary outcomes as difficulties in emotion regulation, measured with DERS, and symptoms of depression. At a six-month follow-up these outcomes had further improved, and an improvement in anxiety symptoms was also found. Significant improvements in DERS scores from pre- to posttreatment have also been found in studies on different forms of dialectical behavior therapy (DBT), cognitive behavioral therapy (CBT) and acceptance and commitment therapy (ACT). Standard outpatient DBT, CBT for bulimia nervosa and group-based ACT for BPD are a few examples of treatment methods which have been studied (see Gratz et al., 2020 for more information).

Use of DERS with children and adolescents

Weinberg and Klonsky (2009) tested DERS in a community sample of 428 adolescents (13-17 years) and showed adequate psychometric properties, similar to those found in adults, including for the six subscales. Robust correlations with psychological problems such as depression (r = .65) and anxiety (r =.42) were also shown. Vasilev et al. (2009) also validated DERS in a youth sample (N = 193, 11-15 years of age) in addition to comparing DERS scores with a physiological measurement related to emotion regulation called respiratory sinus arrhythmia. They found that DERS had similar psychometric properties as when used in adult samples, and a positive correlation with parental reports of child psychopathology. Neumann

et al. (2010) explored the utility of the DERS scale in adolescents (11-17 years, N=870), while also comparing DERS scores with measures of internalizing and externalizing symptoms. They found significant correlations between all DERS subscales (except awareness) and measures of both anxiety and depression. They also found correlations between aggressive behaviors and the three subscales goals, impulse and strategies. The factor structure and psychometric properties of DERS were confirmed once more by Perez et al. (2012) in a sample of adolescent inpatients (age 12-17 years, N=218), while also exploring the relation between different aspects of emotion regulation difficulties and non-suicidal self-injury, NSSI. When controlling for gender, age and internalizing and externalizing disorders, the only subscale of DERS that accounted for a significant portion of the variance in NSSI was the strategies subscale.

In a Swedish pilot study by Holmqvist, Larsson et al. (2020) the feasibility of a group skills training in emotion regulation for adolescents and parents, as an add-on intervention, was examined. Twenty adolescent patients (14-17 years) from an outpatient unit of a child and adolescent psychiatric clinic in Sweden and 21 adult parents participated in five 2-hour weekly sessions of emotion regulation skills training. DERS was used as primary outcome measure. While only adolescents had heightened DERS scores pre-treatment (comparable to those of adult women with BPD and self-harm), DERS scores from both adolescents and parents significantly improved from pre- to post-treatment. For adolescents, measures of alexithymia were significantly reduced while measures of depression and anxiety did not change within the short time-period of this intervention.

Understanding onset of psychopathology in adolescence

Common mental health issues, such as depression and anxiety disorders often have their onset during adolescence. For example, in a large US sample, the median age-of-onset for anxiety disorders (as diagnosed by *DSM-IV*) was 11 years, and most of these disorders had an age-of-onset between 6 and 21 years (Kessler et al., 2005). Mood disorders had a generally later onset (median age-of-onset 30 years), but disorders with later onset was often not the only mental disorder reported by the respondent. A large-scale meta-analysis of 192 epidemiological studies reported peak age at onset for any mental disorders to 14.5 years, and most between 11 and 34 years (Solmi et al., 2022). The proportion of individuals with onset for any mental disorders before the age of 14, 18 and 25 were reported as 34.6%, 48.4% and 62.5%. The study also found that the median age-of-onset for specific mental disorders maps onto a time continuum forming four groups: 8-13 years (phobias/separation anxiety/autism spectrum

disorder/attention deficit hyperactivity disorder/social anxiety), 17-22 years (anorexia nervosa/bulimia nervosa/obsessive compulsive, binge eating and cannabis use disorder), 25-27 years (schizophrenia, personality, panic and alcohol use disorders) and 30-35 years (post-traumatic/depressive/generalized anxiety/bipolar/acute and transient psychotic disorders). In a longitudinal assessment of mental health (N=1013), the proportions of individuals meeting the criteria for mental disorders at ages 11-15 years and 18 years were reported as 35% and 50% respectively (Caspi et al., 2020). In this study onset in adolescence was associated with more years and greater diversity of disorders, as well as reduced likelihood of recovery. These results show that the timing of good mental health promotion and early interventions are important, and that more mental health resources should be directed toward efforts to prevent mental disorders. Still, only a minority of children with mental disorders receive effective treatment (Caspi et al., 2020).

We have yet to understand the full complexity of factors influencing adolescent psychopathology, for example during puberty. The explanation for the common onset of psychological problems during adolescence most likely lies in a combination of biological changes to the brain, hormonal activity, cognitive development and the youth's social context (Kerekes et al., 2021; Moltrecht et al., 2021). These developmental changes could also give rise to difficulties in emotion regulation, with an increase in the experienced intensity of emotions combined with a maladaptive shift in use of strategies for emotion regulation (Cracco et al., 2017; Moltrecht et al., 2021). Difficulties with emotion regulation have been associated with both internalizing symptoms, such as somatic complaints, anxiety and depression, and externalizing problems, such as delinquent and aggressive behaviors (Garnefski et al., 2005; Neumann et al., 2010).

Also, there is substantial research that indicates that mental health issues are interrelated. The HiTOP model is built from the ground up based on correlations between symptoms. These groupings of symptoms can be classified into spectra and eventually there is evidence for a common p-factor that could explain psychological dysfunction broadly (Kotov et al., 2017). In a longitudinal assessment of mental health disorders Caspi et al. (2020) identified the existence of such a general factor of psychopathology. The authors conclude that mental disorder life histories involve different successive disorders which, in combination with genetic and neuroimaging findings, points to transdiagnostic factors (Caspi et al., 2020). Emotion regulation have been suggested as one potentially unifying function of diverse symptom presentations

(Gratz & Roemer, 2004), but very few studies have examined associations between difficulties in emotion regulation and symptoms in youth samples.

The present study

The main purpose of this study is to examine associations between difficulties in emotion regulation and empirically supported symptom dimensions of psychopathology in a sample of Swedish children and adolescents. We will use the IDAS-II as a measure of symptom dimensions since it provides unique opportunities to study emotion regulation across dimensions that align with the HiTOP initiative. Studies including youth are important as most mental disorders onset before adulthood. Specifically, we will examine associations between emotion regulation difficulties and four important symptom dimensions in youth: Dysphoria, Ill Temper, Social Anxiety and Panic. Dysphoria was selected because it is a broad, but still psychometrically distinct, scale representing core emotional and cognitive symptoms of mental distress, is a strong marker of negative affect and has been shown to predict internalizing psychopathology (Stasik-O'Brien et al., 2019; Watson et al., 2012). Ill Temper assesses feelings of anger and hostility that can serve as an alternative expression of depressed mood in children and adolescents (American Psychiatric Association, 2000). The Social Anxiety and Panic symptom dimensions have shown good ability to identify social anxiety disorder and panic disorder, respectively (Stasik-O'Brien et al., 2019). Social anxiety disorder has been shown to be the anxiety disorder which most commonly onsets in the age range of our sample, while panic disorder more commonly onsets in young adulthood, although panic symptoms are common during adolescence, especially among youth suffering from mental health problems (Solmi et al., 2022). Since no studies have examined how emotion regulation difficulties are related to the empirically supported symptom dimensions of IDAS-II in youth, we conducted the present study in an exploratory fashion without any predefined hypotheses. The goal was to examine whether emotion regulation difficulties were associated with all four symptom dimensions and/or whether it was more strongly associated with any of the symptom dimensions. Deeper knowledge about the role of emotion regulation and psychopathology in youth is important to increase the understanding of the development of psychopathology and how to best design prevention and effective interventions for those struggling with mental health problems during childhood and adolescence.

Methodology

Participants

633 Swedish children and adolescents aged 10-19 years completed an anonymous online survey. The only inclusion criteria was being aged 10-19 years. No additional inclusion or exclusion criteria were used to maximize sample size and variation in scores. In addition to age, participants reported on gender and current and prior mental health status and treatment. Sociodemographic and mental health information of the sample is presented in Table 1.

Table 1

Participants

Variable	Value
N	633
Age, M (SD) [Range]	16.57 (1.97) [10-19]
Gender	
Girls, n (%)	433 (68%)
Boys, n (%)	182 (29%)
Other, n (%)	6 (1%)
Unsure, n (%)	10 (2%)
Do not want to report, n (%)	2 (<1%)
Mental health problems now, n (%)	321 (50%)
Mental health problems earlier, n (%)	400 (63%)
Treatment for mental health problems now, n (%)	119 (19%)
Treatment for mental health problems earlier, n (%)	217 (34%)

Measures

IDAS-II

The IDAS-II is a 99-item measure, organized into 18 scales. It measures mood, anxiety and bipolar symptoms (Watson et al., 2012). In this study we analyzed the Dysphoria, Ill Temper, Panic and Social Anxiety scales. The IDAS-II has shown excellent model/data fit, excellent internal consistency of its subscales and good divergent and convergent validity in Swedish children and adolescents (Cervin et al., 2022). Cronbach's alpha for the scales in this

sample were good to excellent: Dysphoria (0.90), Ill Temper (0.88), Panic (0.91) and Social Anxiety (0.83).

DERS-16

The Difficulties in Emotion Regulation Scale (DERS) is a self-report measure of emotion regulation difficulties. DERS is widely used and has extensive empirical support (Gratz et al., 2020). The DERS-16 was developed to measure the same construct as DERS in situations or settings where the original 36 item DERS may be challenging to administer (Bjureberg et al., 2016). The DERS-16 includes items related to lack of emotional clarity, difficulties engaging in goal-directed behavior, controlling impulses, ineffective emotion regulation strategies and non-acceptance of emotional responses, but all items load onto a single factor reflecting difficulties with emotion regulation. Respondents indicate how often each of the 16 statements apply to them using a 5-point Likert scale ranging from 1 (almost never/0–10% of time) to 5 (almost always/91–100% of time). To our knowledge, the DERS-16 has not been used with adolescents before. However, the original DERS has shown reliable psychometric properties, similar to when used with adults, in adolescent samples and the items contained in DERS-16 have not been changed compared to the original DERS. Cronbach's alpha for the scale in this sample was 0.95.

Procedure

Data were collected through an anonymous online survey administered via Sunet Survey. Invitation to participate was sent to and shared through schools and youth health centers and via social media (e.g., Facebook). Data were collected in two waves, one between September and November in 2018, and one between February and May in 2022.

Statistical analyses

Statistical analyses were conducted using IBM SPSS Statistics (version 28.0.0.0). Tests of normality were performed and although a few outliers were found, the size of the sample justified an assumption of normality. The 18 participants who answered something other than boy or girl were deemed to be too few to include in analyses that included gender. Thus, a variable was created that included only the participants who identified as either boys or girls regarding gender. The item scores corresponding to the four symptom scales were added and averaged to form the four symptom variables Dysphoria, Ill Temper, Panic and Social Anxiety. The same was done with the items from DERS-16 to form the variable DERS indicating difficulties with emotion regulation.

First, zero-order Pearson correlations between the symptom dimensions and DERS were estimated. Then, four different regression analyses were performed where the four symptom variables in turn were entered as the dependent variable and DERS, age and gender were the independent variables. Age and gender were added as covariates as it was expected that these variables could be related to the different symptom dimensions, and we wanted to account for these effects in the analyses. Last, a single regression analysis was performed with DERS as the dependent variable and Dysphoria, Ill Temper, Panic and Social Anxiety, age and gender as independent variables. This model accounted for correlations among the symptom dimension scales.

Ethics

The study was approved by the regional ethics committee as part of an amendment to a larger clinical research project (Dnr: 2018/668). As the collection of data was anonymous, the safe keeping of data did not pose a problem. The problem posed by collecting data anonymously was instead that we could not pick up on the participants' reactions to the questions or offer support when needed. Given that the nature of the questions asked in the survey could lead to participants experiencing a need to further discuss their perceived mental health, the material included information about how to get help and links to relevant webpages. To make sure that everybody who, upon answering the inclusion criteria question about age, moved on to fill out the rest of the survey also felt included when answering the next demographic question about gender, three alternatives to the binary male or female were presented, in line with the recommendations from The Swedish Federation for Lesbian, Gay, Bisexual, Transgender, Queer and Intersex Rights, RFSL. The number of participants using the non-binary alternatives turned out to be too few (see Table 1) to be included in statistical analyses where gender was a variable. In order to not exclude this group from contributing to the results, we conducted the regression model where DERS was the dependent variable and the four symptom dimensions the independent variables, with the whole group of participants included.

Results

Means, standard deviations, skew and kurtosis for the measures used in the analyses are presented in Table 2. While some of the values for skew and kurtosis were somewhat high, they were all within acceptable limits. Table 3 shows the zero-order correlations for the same measures. All correlations were statistically significant and in the moderate to large range. The

correlation between Dysphoria and Panic indicated possible difficulties with multicollinearity since the correlation was slightly above the cut-off of 0.7.

Table 2

Descriptive statistics

	M (SD)	Skewness	Kurtosis
DERS	42.76 (16.55)	0.17	-0.96
Dysphoria	29.04 (9.41)	-0.05	-0.94
Ill Temper	12.33 (5.41)	0.48	-0.75
Panic	17.17 (7.61)	0.73	-0.39
Social Anxiety	16.52 (6.05)	0.29	-0.77

Table 3

Zero-order correlations between DERS and the IDAS-II scales. All the correlations are significant at the p<.001 level

	DERS	Dysphoria	Ill Temper	Panic	Social Anxiety
DERS	-				
Dysphoria	.41	-			
Ill Temper	.32	.59	-		
Panic	.33	.71	.57	-	
Social Anxiety	.31	.66	.38	.56	-

Regression models

First, we used each of the symptom scales as the dependent variable in four different regression models where DERS was the independent variable alongside age and gender (girls/boys, N=612). The results are presented in Table 4. Each of the symptom dimensions were significantly correlated with DERS with the largest association emerging for Dysphoria. DERS, age and gender explained the greatest amount of variance in Dysphoria (25%), while the other models explained less of the variance for their respective symptom dimensions. Statistically significant, medium sized, associations between gender and the symptom dimensions were found for all symptom dimensions, with girls scoring higher than boys. For age, significant but small, associations were found for two symptom dimensions, Dysphoria

and Ill Temper, with increasing age being associated with higher scores on Dysphoria and lower scores on Ill Temper.

Table 4

Four different regression models with the symptom dimensions as the dependent variable

Independent variables	Standardized Beta	*p*	R^2 for full model
Model 1 - Dysphoria			25.0%
DERS	.37	<.001	
Age (years)	.12	.001	
Gender (girl/boy)	.24	<.001	
Model 2 – Ill Temper			16.1%
DERS	.29	<.001	
Age (years)	-.12	.002	
Gender (girl/boy)	.22	<.001	
Model 3 - Panic			16.5%
DERS	.29	<.001	
Age (years)	.01	.72	
Gender (girl/boy)	.25	<.001	
Model 4 – Social Anxiety			13.4%
DERS	.28	<.001	
Age (years)	.03	.38	
Gender (girl/boy)	.20	<.001	

To examine the unique association of each of the IDAS-II symptom dimensions in relation to emotion regulation, we used a model where DERS was used as the dependent variable and the four symptom dimensions as independent variables. First, we used age and gender as covariates but because gender was not significantly associated with DERS, we reconducted the model without gender, enabling us to use data from all participants contributing with data in the study (N=630). Results are presented in Table 5. The full model explained 18.2% of the variation in emotion regulation and the only variables that were statistically significantly associated with DERS were Dysphoria and Ill Temper.

Table 5

A multivariable regression model with DERS as the dependent variable and the four IDAS-II scales as independent variables alongside age

Independent variables	Standardized Beta	*p*
Dysphoria	.27	<.001
Ill Temper	.12	.02
Panic	.02	.72
Social Anxiety	.07	.19
Age (years)	.03	.50

Discussion

The purpose of this study was to examine associations between different forms of internalized symptom dimensions and difficulties in emotion regulation in Swedish children and adolescents. The scope of the study did not allow for us to include all the 18 symptom dimensions of IDAS-II. Therefore, to cover a variety of symptoms of relevance during adolescence, we selected four dimensions. Dysphoria was selected because it assesses core emotional and cognitive aspects of depression and anxiety. The Ill Temper scale was selected as a complement to Dysphoria because irritability is believed to sometimes replace other emotional and cognitive symptoms of depression, particularly in adolescents. The Panic and Social Anxiety scales assess more specific symptom dimensions related to separate anxiety disorders, the latter of which more commonly onsets in the age range represented in our sample. As difficulties in emotion regulation has been proposed as a potentially unifying function of diverse symptom presentations (Gratz & Roemer, 2004), we wanted to examine if it was similarly associated with the different symptom dimensions. To assess difficulties with emotion regulation, we selected the DERS because it approaches emotion regulation in a way that does not require a great ability for cognitive reasoning about emotion or emotion regulation and can be used with children and adolescents.

All four IDAS-II scales correlated significantly with each other, which indicates that one type of mental health problem is associated with other types of problems, which is in line with one of the main tenets of HiTOP (Kotov et al., 2017). As the IDAS-II scales are constructed to measure different but related dimensions of symptoms of depression and anxiety, correlations between them were to be expected and our results are in the same range as the correlations reported in the original validation of IDAS-II (Watson et al., 2012).

The correlations between the symptom dimensions and DERS were lower than the correlations among the symptom dimensions, but still clearly statistically significant and in the medium range. These results align with associations found between difficulties in emotion regulation and constructs of depression and anxiety in other studies (Bjureberg et al., 2016; Gratz et al., 2020; Neumann et al., 2010; Weinberg & Klonsky, 2009). In short, statistically significant correlations confirm that Dysphoria, Ill Temper, Social Anxiety and Panic are associated with difficulties in emotion regulation among Swedish children and adolescents, which is in line with theoretical notions of emotion regulation being a potential unifying transdiagnostic factor in relation to psychopathology (Gratz & Roemer, 2004).

When we examined the associations through regression models, we also accounted for differences in age and gender which we expected to possibly be related to the symptom dimensions. With DERS as the independent variable alongside age and gender, and the symptom dimensions as dependent variables, results showed that DERS was significantly associated with each of the four symptom dimensions. The model with Dysphoria as the dependent variable showed the largest association (standardized Beta: 0.37) and explained the largest amount of variance (25%). The models for the other three symptom scales showed similar and moderate associations (standardized Betas 0.28-0.29). The models with Ill Temper and Panic also explained similar amounts of variance (16.1% and 16.5%), while the model with Social Anxiety explained less (13.4%) variance, mostly because age and gender did not explain as much variance in this model. Thus, we can conclude that difficulties with emotion regulation explain part of the variance in the four different symptom dimensions. The regression models also showed a significant association between gender and the symptom dimensions, with moderate effects that were similar for all the symptom dimensions (standardized Betas from 0.20 to 0.25). Finding that girls score higher than boys on internalizing symptoms is in line with research showing that women have significantly higher risk than men of anxiety and mood disorders (Kessler et al., 2005). However, no gender differences were found for any of the symptom dimensions used in this study when IDAS-II was examined by Nelson et al. (2018). It is possible that gender differences are more likely to emerge in a youth sample, but since we have found no other studies using IDAS-II with children and adolescents, we have nothing to compare the results of this study with. The associations between the symptom dimensions and the other covariate, age, are less uniform. Research with adults has found that age is inversely associated with internalizing symptoms measured via IDAS-II (Nelson et al., 2018). In our

models, this was only true for the Ill Temper symptom dimension, while the Dysphoria symptom dimension shows the opposite association. No significant associations with age were shown for the other two symptom dimensions.

When we used DERS as a dependent variable and the symptom dimensions alongside each other as independent variables, it was once again Dysphoria that showed the strongest association with difficulties in emotion regulation. Among the other variables, only Ill Temper showed a significant, but small, association with DERS. The Dysphoria symptom dimension stood out in our results as having overall higher correlations with the other dimensions as well. This makes sense, given that the Dysphoria symptom dimension was the strongest contributor to a single general factor in the original IDAS, and to the distress factor in IDAS-II. Thus, the Dysphoria symptom dimension captures symptoms of depression and anxiety that are less specific than the other symptom dimensions we examined. The strong association between the Dysphoria symptom dimension and the difficulties in emotion regulation measure in our results suggests that the DERS measure is more strongly associated with symptoms of general distress and negative affect than with more specific anxiety symptoms such as Panic and Social Anxiety.

In an interesting parallel to the Dysphoria symptom dimension and the distress factor proposed in IDAS-II, Guineau et al. (2022) found that anhedonia severity and depression symptom severity were both central to a network of mental disorders often related through comorbidity, namely major depressive disorder, anxiety disorders, attention deficit hyperactivity disorder (ADHD) and autism spectrum disorder (ASD). Anhedonia, or loss of pleasure in formerly enjoyable activities, are apparent in different mental disorders and is suggested to be related to dysfunctions in the reward system and/or emotion regulation. Since Dysphoria is a broad scale containing anhedonia as well as other depressive symptoms it seems possible that it captures something of the same transdiagnostic factor as the one found in this study.

Limitations and future considerations

Half the sample reported having current problems with mental health, which is confirmed by the mean scores on the measures used in the study compared to means from prior studies using the same measures in community, and to some extent, clinical adult samples (Bjureberg et al., 2016; Watson et al., 2012). It can be considered a limitation of the study that the sample may not be representative for the general population in this regard. However, it can also be considered a strength, as we were looking for associations between variables that are

likely scored higher in this sample than they would be in a more representative sample. Thus, more participants with mental health problems generated more variation in scores and larger statistical power to identify and estimate associations between our measures.

We have found no studies on children and adolescents using the brief version of DERS used in this study, DERS-16. This limits our possibilities to compare our results with other studies. If we had chosen to administer the full DERS, in addition to better being able to make comparisons to other studies, we would also have been able to examine associations between the symptom dimensions and different aspects of difficulties in emotion regulation, rather than just a general DERS factor. It would for example be interesting to further examine associations between the symptom dimensions Dysphoria and Ill Temper and DERS subscales such as strategies and nonacceptance. Thus, a second limitation is the more narrow measure of emotion regulation difficulties used in this study.

The present study compared emotion regulation to specific symptom dimensions (Dysphoria, Ill Temper, Panic and Social Anxiety). But as Conway et al. (2019) points out it is not at all certain that psychological issues are best explained at this level of the psychopathological hierarchy. It is possible that emotion regulation would have a greater association at a higher level, such as at the subfactor or spectra level of HiTOP. Future research could for example use all the symptom scales of IDAS-II to get a measure of the internalizing spectra and examine its association with emotion regulation.

Conclusions

In summary, this study found that in a large sample of Swedish children and adolescents, there was a moderate correlation between difficulties in emotion regulation and four different symptom dimensions of psychopathology. The association between psychopathology and emotion regulation was greatest for Dysphoria, which indicates that difficulties with emotion regulation may be most clearly related to broad but non-specific mental health issues in youth.

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