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Increase in Prevalence of Depression Among Girls in Early Adolescence – the Contribution of Cognitive Factors. A Literature Review

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Abstract

Depression is a serious mental disorder with childhood and adolescent onset and a high degree of life-time recurrence. The purpose of this literature review is to examine the increase in prevalence of depression among girls in early adolescence, and how different factors have been hypothesized to account for this increase. Further, through a systematic search, the present review focus on cognitive factors, and how they contribute to the increase in prevalence of depression among girls in early adolescence. The search yielded twenty-three articles with a longitudinal design that examined cognitive factors such as rumination, attributional style, maladaptive schemas, overgeneral autobiographical memory, and cognitive ability. The result indicated that the cognitive factors had different roles in predicting depressive symptoms, such as mediator, moderator and vulnerability factor. Some articles found that cognitive factors contributed to the increase in depression only in girls, while other articles did not support this. Cognitive factors are likely to play a significant role in pathways to depression among girls in early adolescence, but the result from this review did not indicate clearly how. An implication is that interventions should be initiated in early adolescence or before, because some cognitive factors are stabilizing and becoming more trait-like among girls in this period. A recommendation for future research is to conduct longitudinal studies with several times of measurements, and shorter intervals between measurements.

Keywords: depression, adolescence, girls, cognitive factors, development

Sammendrag

Depresjon regnes som en alvorlig psykisk lidelse som debuterer i barne- og ungdomsalder, og som ofte har høy forekomst av tilbakefall. Formålet med denne litteraturstudien er å undersøke økningen i prevalens blant jenter i tidlig ungdomsalder, og hvordan ulike faktorer har blitt brukt til å forklare denne økningen. Gjennom et systematisk søk ble det fokusert på kognitive faktorer, og hvordan disse kan bidra til økningen i prevelans blant jenter i tidlig ungsomsalder. Søket ga tjuetre relevante artikler med et longitudinelt design, som undersøkte kognitive faktorer som grubling, attribusjonsstil, maladaptive skjemaer, overgenerell autobiografisk hukommelse, og kognitive evner. Resultatet indikerte at kognitive faktorer har ulike roller i forhold til depressive symptomer, som mediator, moderator, og sårbarhetsfaktor. Noen artikler fant at kogntive faktorer bidrar til depresjon kun blant jenter, mens andre artikler ikke støttet dette. Kognitive faktorer spiller sannsynligvis en viktig rolle i utviklingsbaner som leder til depresjon i denne gruppen, men resultatet fra denne litteraturstudien viste ikke tydelig hvordan. En implikasjon er at intervensjoner bør igangsettes i tidlig ungdomsalder, eller før, fordi noen kogntitive faktorer begynner å bli stabile og mer som trekk blant jenter i denne perioden. En anbefaling for fremtidig forskning er å gjennomføre longitudinelle studier med flere målinger, og med kortere tidsintervaller gjennom målingene.

Stikkord: depresjon, ungdom, jenter, kognitive faktorer, utvikling

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Depression is recognized as a serious mental disorder with childhood and adolescent onset, high degree of life-time recurrence and a chronic course (Hammen & Rudolph, 2003; Rudolph, Hammen, & Daley, 2006). When studying the prevalence of depression in children and adolescents, it is impossible not to notice the rapid increase of depression in early adolescence (12 to 14 years) especially in girls (Hammen & Rudolph, 2003; Hankin, Wetter, & Cheeley, 2008). By mid- to late adolescence (15 to 19 years), girls become twice as likely as boys to be depressed, and the gender difference in depression is one of the most reliable findings in psychopathology research (Garber, 2010; Hyde, Mezulis, & Abramson, 2008). However, we do not know exactly what factors account for the increase, and how (Angold & Rutter, 1992). Multiple factors are correlated with depression onset, but we know less about the predictive value of these factors, and the developmental pathways that lead to depression across childhood and adolescence (Avenevoli, Knight, Kessler, & Merikangas, 2008). It is suggested that there exist different pathways to depression, and that age of onset, gender, and different comorbidity represent heterogeneity in depression (Avenevoli et al., 2008). The cognitive development that happens in the transition from childhood to adolescence is of great importance, and it has been noted that cognitive factors are likely to be important when it comes to understanding the increase in depression in early adolescence (Mezulis, Hyde, Simonson, & Charbonneau, 2011).

In this review I will first examine the increase in prevalence of depression among girls in early adolescence, and in what way factors such as biology and genetics, stress, temperament, interpersonal relationships, gender role expectations, and cognitive factors have been hypothesized to account for this increase. Further, through a systematic search, I will focus on cognitive factors, and how they contribute to the increase in prevalence of depression among girls in early adolescence.

What Is Depression?

Diagnosis and depressive symptoms across development. Depression is characterized as an internalizing disorder, but how depression is conceptualized varies in the empirical literature (Reynolds & Johnston, 1994). Depression can be conceptualized as an affective state of mind, a discrete measure of depressive symptoms (Avenevoli et al., 2008) , or as fulfilling the criteria for a Major Depressive Disorder (MDD) in the Diagnostic and Statistical Manual of Mental Disorders (DSM).

Depression as an affective state of mind is conceptualized as sadness and/or irritability with no requirement of number of symptoms or timeframe (Hankin, Grant, et al., 2008). In some research, depression is measured in self-report questionnaires as level of depressive symptoms, rather than as a categorical diagnosis. This is often in longitudinal studies, where large community samples are used. Depression is also conceptualized as MDD in DSM-5, where a set of symptoms have to meet the criteria for the DSM-diagnosis. DSM-5 was published in May 2013, but MDD criteria did not change much from the previous manual (bereavement criteria and Bipolar were removed), so research that used criteria from previous DSM manuals is still considered to be valid. Most research on depression refers to MDD as described in DSM rather than the International Classification of Diseases (ICD). See Table A1 in Appendix A for a description of the diagnostic criteria for MDD in DSM-5.

There is a solid base of evidence that depressive symptoms as seen in adults also can be observed among children and adolescents (Hammen & Rudolph, 2003). This is in contrast to the belief in psychiatric history that children could not be depressed (Hammen & Rudolph, 2003). Diagnostic criteria for adult depression is usually applied when diagnosing children and adolescents (Kessler, Avenevoli, & Ries Merikangas, 2001), but some adaptions are made. When

diagnosing persistent depressive disorder (equivalent to dysthymia), children and adolescents must have had symptoms for 1 year, while adults must have had symptoms for 2 years (American Psychiatric Association, 2013). The symptom of irritability can be present instead of depressed mood in youngsters (Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). Children tend to have somatic symptoms, rather than depressed mood and hopelessness (Cicchetti & Toth, 1998). A proposed explanation for this is that children have not yet developed the capacity for experiencing cognitive and emotional symptoms of depression in the same way adults do (Cicchetti & Toth, 1998; Hankin, Grant, et al., 2008). According to DSM-5, in children you should consider failure to make expected weight gain instead of weight loss as a symptom of depression (American Psychiatric Association, 2013). In addition, adolescents experience hypersomnia as a symptom of depression in a much higher degree than children (Kovacs, 1996). Further, auditory hallucinations are not unusual among preadolescent youngsters with MDD (Chambers, Puig-Antich, Tabrizi, & Davies, 1982). Delusions, on the other hand, are unusual (Hammen & Rudolph, 2003). Some symptoms, although not listed in the DSM-5 are typical of depression in children and adolescents. These include social withdrawal, somatic symptoms, and negative body image, especially among adolescent girls (Hammen & Rudolph, 2003; Kashani, Rosenberg, & Reid, 1989). Lewinsohn, Rohde, and Seeley (1998) found in a population of depressed adolescents, that girls compared to boys had higher levels of weight problems, and feelings of worthlessness and guilt. Clearly, it is important to differentiate between developmental stages in the life span and gender when it comes to depressive symptomatology.

It is acknowledged that depression is dimensional rather than categorical, which means that there is not a particular separation criteria between those children and adolescents diagnosed with depression, and those with subclinical symptoms of depression (Hankin, Fraley, Lahey, &

Waldman, 2005). Some studies find that there exists a large group of children and adolescents with subclinical symptoms of depression, and that these children and adolescents can have an equally large loss of function, and can be equally in need of treatment (Abela & Hankin, 2008). Hankin et al. (2005) argue that it is appropriate to use community samples in research on risk factors for depression, and not clinical samples, because this captures the discrete nature of depression in the sample, rather than the categorical diagnostic depression.

Course and prevalence. After heart disease, depression is estimated to become the biggest cause of disability around the globe in year 2020 (Murray & Lopez, 1997). Depression in adolescence is also related to a lot other of negative outcomes such as lower education levels, unwanted pregnancies, intimate partner violence and health problems (Hammen, 2009; Hankin, Grant, et al., 2008; Kessler et al., 2001). Depression also entails considerable psychosocial impairments and suffering for those individuals affected (Kessler et al., 2003). Many adolescents with depression are not discovered by the health care system, and therefor go untreated. Of those that receive treatment for depression (psychosocial or medical interventions), 40-50% do not respond to the treatment, and stay depressed (Fonagy, Target, Cottrell, Phillips, & Kurtz, 2002). It is definitely a need to improve the treatments available for depression, and it is possible that a better understanding of the etiology of depression could help to improve treatments for depression.

It has been discussed whether the total prevalence of depression among children and adolescents has increased the last couple of decades (Gotlib & Hammen, 2009; Reynolds & Johnston, 1994). According to Costello, Foley, and Angold (2006), however, the prevalence of depression in children and adolescents has not increased from 1960 until the date of study.

Kashani et al. (1983) found a lifetime prevalence of 1.1% in a sample of nine year olds. The point prevalence estimation for MDD in school aged children has been reported to be from one percent (Costello et al., 1996) to two percent (Kashani et al., 1983). Some researchers have found that boys compared to girls in pre-adolescence exhibit higher rates of depression (Angold, Costello, & Worthman, 1998; Steinhausen & Winkler, 2003), while others have found equal rates between the genders (Angold & Rutter, 1992). Point prevalence of adolescent depression has been found to be eight percent (Kessler & Wang, 2008). Life-time prevalence of MDD in adolescents between 15 to 18 years old was found to be 14%, and additionally 11% had depressive symptoms but did not meet the criteria for MDD (Kessler & Walters, 1998). Lifetime prevalence estimates of depression in adolescents have ranged from four percent to 25% (Kessler et al., 2001; Whitaker et al., 1990). The variation found in life time prevalence numbers in different studies can be due to factors such as different use of the criteria for MDD and bias in the interviewers (Kessler et al., 2001).

When studying the prevalence of MDD from childhood to adolescence, it is impossible not to notice the dramatic increase. By mid- to late adolescence prevalence of depression is comparable to rates of depression found in adult populations (Garber, 2010; Rudolph et al., 2006). The other noticeable finding is the difference in prevalence you see in girls and boys that emerge during the adolescent years. Hankin, Wetter, et al. (2008) report that depressive symptoms in girls increase after the age of 13, while for boys the rates of depression remain stable or increase at a slower rate compared to girls.

Approximately 40% of children and adolescents diagnosed with a depressive episode experience recurrence of MDD in adulthood, and over half of them experience affective disorders (here including MDD, bipolar, and dysthymia; Dunn & Goodyer, 2006) . Further,

adolescents diagnosed with MDD are at high risk for other psychiatric disorders in young adulthood (Lewinsohn, Rohde, Seeley, Klein, & Gotlib, 2000). However, depression is a disorder with considerable variation in its course. Not all young people that become depressed experience recurrence; some people seldom, if ever experience more than one episode of depression, or go years between depressive symptoms (American Psychiatric Association, 2013).

Comorbidity. Kovacs (1996) reports that children and adolescents with MDD have slightly more comorbidity compared to adults and elderly. Generally, depression in youngsters tend to co-occur with anxiety disorders, attention-deficit disorders, disruptive behavior disorders, substance use disorders and eating disorders (Hammen & Rudolph, 2003). The high comorbidity poses a challenge for understanding etiology of, and developmental pathways to, depression. Risk factors for depression and risk factors for other psychiatric disorders might correlate, and there might be common risk-factors for disorders that occur together (Angold, Costello, & Erkanli, 1999; Hammen & Rudolph, 2003). There may exist subtypes of depression that typically co-occur with other disorders (Reynolds & Johnston, 1994). The increase in prevalence of depression in early adolescence, and especially in females, is specific for depression, and is not found in all psychopathology (Hankin & Abramson, 2001).

Etiology of Depression Across Development

Etiology means the study of causes, or the factors that come together and cause an illness (Kazdin, Kraemer, Kessler, Kupfer, & Offord, 1997). There is no clear-cut knowledge about what factors are most important for the increase in depression among girls in early adolescence (Goodyer, Herbert, Tamplin, & Altham, 2000), but we know that it is unlikely that there exists a single cause for this increase (Cicchetti, Rogosch, & Sheree, 1994).

One finding is that the etiology of depression is heterogeneous, with different subgroups of depression (Jaffee et al., 2002; Rudolph et al., 2006). The heterogeneity that is found within adolescents having the same symptoms of depression is a challenge for theory, research and treatment of depression (Jaffee et al., 2002). Kraemer (2003, p. 421) recommends that researchers should try to avoid "muddling", where populations with different risk factors are treated as one population. A lot of research on depression only differentiates between adult and child depression, without sorting out adolescents as a unique group. Girls and boys are also often treated as one group even though it is uncertain if they share the same risk factors. This can be a mistake, because depression in childhood and adolescence might have different expressions, causes, and outcomes.

History and Possible Explanations for Increase in Depression Among Adolescent Girls

The Isle of Wight Study was the first to emphasize that depression increased rapidly in adolescence, and that this pattern was unique for depression (Rutter, Graham, Chadwick, & Yule, 1976). When it comes to explaining the difference in prevalence of depression in girls and boys, there have been numerous explanations. One hypothesized explanation of the difference in prevalence was that it was not a real difference, but reflected difference in reporting symptoms (Hankin & Abramson, 1999). Hence, the difference would occur because girls were more likely than boys to report and talk about depressive symptoms. This hypothesis has not received support, and one study found that depression was equally likely to be detected in depressed boys and girls by primary physicians (Gater et al., 1998).

In what now is considered a classic paper, Rutter (1986) described possible mechanisms that could explain the sharp rise in depression in adolescence, and especially for girls (Strauman, Constanzo, & Garber, 2011). He proposed that one mechanism could be the hormonal change

that accompanies puberty, and this could be related to mood, especially for girls. The second mechanism he discussed was risk genes, where he hypothesized that depression that occurs during adolescence reflects different genetics than for childhood onset depression. Third, he mentioned that the emotional changes that puberty entail, lead to a higher frequency of environmental stressors, although he posed the question how this could explain the gender difference in depression. Fourth, he described possible individual differences when it comes to vulnerability and protective factors, and where differences in gender roles in society might make girls more prone to depression. The fifth mechanism suggested, was how cognitive schemas around learned helplessness might be related to depression, and girls could have learned this helplessness from adults who provide different feedback for girls and boys. Finally, Rutter (1986) suggested that increases in depression could be due to adolescents growing developmental capacity to experience and express emotions, and hereby also depression. Research has generated a lot of new findings since then, but the researchers have tended to focus on a limited number of risk factors, often within one or two perspectives at a time, such as biological or interpersonal (Strauman et al., 2011). In the next section I will present how different factors have been hypothesized to explain the increase in prevalence if depression among girls in early adolescence.

What Factors Are Hypothesized to Contribute to the Increase in Prevalence of Depression Among Girls in Early Adolescence?

Biological and genetic factors. In line with Rutter's (1986) hypothesis about the relation between puberty and depression, Angold, Costello, Erkanli, and Worthman (1999) found that higher levels of the hormones testosterone and estrogen in adolescent females were positively correlated with depression. Angold et al. (1998) found that pubertal status measured by Tanner

stages predicted onset of depression in females, better than age. Further, the functioning of the hypothalamus-pituitary-adrenal axis has been found to be more sensitive to stress in girls compared to boys, and could mediate the relationship between environmental stress and depression. Girls with an early onset of puberty, have an elevated risk for depression. For girls who are early matured, stressful life events seem to increase the risk of depression utterly, compared to girls who are not early matured (Ge, Conger, & Elder Jr, 2001). The authors hypothesize that the early maturation and the bodily changes that follow could entail that these girls are met by social norms and expectancies that they are not psychologically prepared to meet (Ge et al., 2001).

One of the strongest predictors of youth depression is having a mother with MDD (Goodman & Gotlib, 1999). There seems to be a greater heritability for depression in adolescent girls compared to boys (Hankin & Abramson, 1999; Strauman et al., 2011). It has been discussed whether environmental stressors and hormonal changes during adolescence might turn on latent genes for depression, but it has been difficult to measure this in prospective studies (Strauman et al., 2011). Hyde et al. (2008) summarize that depression has moderate heritability, and that some genetic factors could be a part of why depression has a rapid increase among girls in adolescence.

Temperament. Temperament can be described as a stable behavioral, emotional and cognitive style that is thought to have a biological base, but can be altered by social experience (Garber, 2010). Negative affectivity, also referred to as neuroticism, is shown to be a risk factor for depression (Garber, 2010). Already in toddlers, there is a gender difference in display of negative emotions (Abela & Hankin, 2008). Boys show more irritation and anger, while girls show more fearfulness. It has been found that shy and withdrawn temperament is related to

depression especially in girls (Gjerde, 1995). When explaining the increase of depression in female adolescents, temperament is often viewed as a vulnerability that interacts with other factors that impact depression, such as stress or cognitive factors (Garber, 2010).

Stressful life events and trauma. Another area of research has focused on how stress is related to onset of depression in adolescent girls (Garber, 2010). Depressed youth experience significantly higher levels of stress in their lives (Goodyer et al., 2000), and also tend to generate more stressful life events (Hankin, Mermelstein, & Roesch, 2007). However, it has been found that increased levels of stressful life-events from childhood through adolescence, predict increase in depressive symptoms only in girls (Rudolph & Hammen, 1999). There has not been found a single stressful life event that is particularly likely to result in depression among adolescent girls (Garber, 2010), although loss, interpersonal conflict and rejection, parents' divorce and conflict, and family violence are life-events that are particularly likely to lead to depression (Goodyer et al., 2000; Hankin, 2005). In addition, sexual and physical abuses, especially when severe, have been found to predict depression for both girls and boys (Harkness & Lumley, 2008). Girls are more often victims of sexual abuse than boys, and this has been posed as a contributor to why more adolescent girls are depressed than boys (Hankin & Abramson, 1999). It does not explain, however, why this pattern emerges in adolescence. Maltreatment experienced only in adolescence has been found to be an equally strong predictor of depressive symptoms as chronic maltreatment during childhood and adolescence (Thornberry, Ireland, & Smith, 2001). Research indicates that the relationship between stress and depression is bidirectional (Hankin et al., 2007), and can create a "vicious cycle" (Garber, 2010). Not all adolescents that experience the same type of stress will become depressed. The vulnerability-stress model, which will be elaborated later in this review, is a useful framework to understand the influence of stress.

Adolescents that already have vulnerability factors such as biological or cognitive, might more readily become depressed when they experience stressful life-events (Garber, 2010).

Interpersonal relationships. The social environment of an adolescent can be both a source of support and a source of distress (Garber, 2010). The research on interpersonal relationships as a risk factor for depression has focused on family and peers.

Family. Depressed adolescents often come from families that are more dysfunctional, and with negative parenting (Rudolph, Flynn, & Abaied, 2008). According to Cyranowski, Frank, Young, and Shear (2000) girls tend to have a greater orientation towards family and intimate relationships compared to boys. It is hypothesized that adolescents that have grown up with insecure attachments, have developed working models that are fixated around abandonment, self-critique and dependency of others (Garber, 2010). Possibly, girls with insecure attachments have a tendency to become depressed, because of girls` greater orientation towards interpersonal relationships. Another finding is that girls react to death of a parent with more depressive symptoms than boys (Little, Sandler, Schoenfelder, & Wolchik, 2011). It might be that girls somehow have a greater tendency to react to interpersonal loss with depressive symptoms.

Peers. According to Garber (2010), interpersonal relationships with peers may play a key role in development and recurrence of depression in adolescents. Depressed adolescent girls are both more rejected from peers, and perceive they are more rejected from peers than others (Goodyer, Wright, & Altham, 1990). Studies have found that they have fewer friends, experience more rejection and have worse social skills than non-depressives. It is hypothesized that having deficits in social skills work as a vulnerability for depression. Girls are also more focused on peer relationships than boys, both when it comes to peer, romantic and caregiving relationships

(Little et al., 2011). If social relationships are not meeting emotional needs, this might make girls prone to depression.

Gender role expectations. Another possible contribution to why there is such a rapid increase in depression among girls in adolescence is the different gender role expectations for girls and boys (Hankin & Abramson, 1999). Cross-sectional studies have found correlations between body dissatisfaction and depressive symptoms in girls (Wichstrom, 1999). Possibly, when girls reach puberty, they identify more with the western female ideals, which entail a massive focus on physical attractiveness and body fitness. Girls who identify with this stereotype female ideal, and reach puberty with increased body fat, might become depressed. It is also worth noting, that when boys reach puberty they become taller and more muscular, which is in accordance with the ideal for the male body. This could mean that the focus on physical appearance makes girls more vulnerable to depression compared to boys, because girls` increased body fat in puberty is not compatible with the female ideal body.

Cognitive Explanations

The cognitive development in the adolescent years facilitates a more abstract self-image where the adolescent views him or herself in terms of stable trait-like attributes and characteristics (Rudolph et al., 2006). According to Inhelder and Piaget (1958), the formal operational stage takes place between the age twelve and fifteen years. The early adolescent begins to use logic thinking to solve abstract problems, and see that its own and others behavior is influenced by situational factors (Carr, 2006). It is also normal to take greater personal responsibility for one`s role in different situations, and generalize across situations. These advancements in cognitive development makes it possible for adolescents to create negative self-images, and make negative generalizations, which have been shown to be linked with depression

(Rudolph et al., 2006). At the same time, in early adolescence there is still a tendency towards cognitive egocentrism, where youth have difficulties realizing that others may have contradicting viewpoints in different situations (Riegel, 1973). This can make it challenging to solve interpersonal problems, where several viewpoints may come in conflict. Kashani et al. (1989) found that depressed adolescents blamed themselves for negative events, which was unusual among depressed children. It has therefore been natural to look at cognitive factors as a source of explanation for the increase in depression among adolescent girls. There has also been interest for the relationship between cognitive ability and depression in adolescence (Glaser et al., 2011). Some also investigate self-esteem as a cognitive risk factor for depression (Orth & Robins, 2013), while others view self-esteem more as a multifaceted concept, with cognitive, emotional, and social dimensions (Tafarodi & Milne, 2002). There are especially three theories of cognitive explanations of depression, which have been influential in the research on cognitive factors.

The response style theory. A ruminative response style to negative events can increase likelihood of depression, and it is proposed that girls to a larger extent than boys ruminate over negative events (Hankin & Abramson, 1999).The response style theory by Nolen-Hoeksema (1991) has been an important influence in research investigating the onset of depression (Burwell & Shirk, 2007). In response style theory, rumination is seen as a way of responding to stress and negative emotions, where the individual repetitively and passively thinks about his or her symptoms or problems, and the causes and consequences of these, while not engaging in any problem-solving that might help relieve the stress (McLaughlin & Nolen-Hoeksema, 2011). Further, Nolen-Hoeksema (1991) argues that people who respond to stress with distraction instead of rumination, are more likely to avoid depression, but instead experience relief. The response style theory has been further developed by dividing rumination into the subtypes

brooding rumination and reflective rumination (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Brooding consists of passively focusing on problems, while reflection is to actively attempt to gain insight into problems (Burwell & Shirk, 2007). Nolen-Hoeksema and Girgus (1994) hypothesize that a ruminative style together with stressful life events could explain the difference in prevalence of depression among adolescent girls and boys.

The hopelessness theory. Another theory that has gained support in research on depression is the hopelessness theory, which emphasizes that the way individuals interpret causes for negative life events, impact if they will become depressed (Calvete, Orue, & Hankin, 2013; Hankin, 2008a). In hopelessness theory, negative attributional style, negative cognitive style, and negative inferential style are related concepts, but cover slightly different aspects of the theory. Attributional style is defined as a tendency to attribute negative events to internal, stable and global causes and positive events to external, unstable and specific causes (Abramson, Metalsky, & Alloy, 1989; Rueger & Malecki, 2011). Negative cognitive style entails attributional style, but also involve that the negative events lead to lower self-worth for the individuals (Auerbach, Ho, & Kim, 2014). Negative inferential style, also entail negative attributional style, and that the inividuals draw negative conclusions about the self after negative events, and in addition that negative events will affect major life areas (Calvete et al., 2013). It is thought that these negative cognitive factors develop from an accumulation of negative life events (Kim-Spoon, Ollendick, & Seligman, 2012), but it is uncertain when in development for example attributional style becomes stable in the individual, and works as a subsequent risk factor for depression.

**Beck`s cognitive theory of depression.** The third theory of how cognitive factors lead to depression is Beck`s cognitive theory of depression (Beck, 1976; Cole et al., 2009). In this

theory, maladaptive schemas are conceptualized as stored bodies of knowledge, that include representations of the self and past experiences (Abela & Hankin, 2009) It is hypothesized that these schemas develop through early learning experiences, often in the family (Young & Lindemann, 1992). These schemas are seen as relatively stable in the individual once developed (Beck, 1976). Further, when the maladaptive or depressive cognitive schemas are activated, these schemas trigger negative cognitions about the self, the world and the future (Beck, 1970; Cole et al., 2009). Beck (1976) further described that maladaptive schemas are organized in dysfunctional attitudes. The maladaptive schemas and dysfunctional attitudes work as cognitive filters in the individual that select negatively biased social and affective information (Hankin et al., 2009). An activation of the maladaptive cognitive schemas has been hypothesized to be related to emergence of depressive symptoms in adolescence.

Overgeneral autobiographical memory. In addition, the cognitive factor overgeneral autobiographical memory has been examined as a vulnerability factor for depression. Autobiographical memories are a collection of personally experienced past events (Williams et al., 2007).The autobiographical memory can be overgeneralized, as when people retrieve memories as categorical events, (" I used to walk my dog every day") rather than a memory of a specific event or day ("I walked my dog yesterday"). Depressed people are more likely to recall overgeneral memories compared to non-depressed people. It has also been hypothesized that overgeneral autobiographical memory can serve as a vulnerability factor for depression (Hamlat et al., 2014). Exactly how overgeneral autobiographical memory lead to depression is not known, but overgeneralizing memories about negative events could possibly affect mood (Stange, Hamlat, Hamilton, Abramson, & Alloy, 2013) Also, people who recall more overgeneral autobiographical memories, have been shown to have impaired problem-solving

skills and decision-making abilities, which may play a role in exacerbating the risk for depression (Hamlat et al., 2014).

Integrated Theories of the Emergence of Gender Differences in Prevalence of Depression

In the last two decades, several prominent researchers have developed theoretical models that put different vulnerability factors for depression into a larger framework, where they also have tried to explain why there is such a rapid increase in depression among girls in adolescence.

Nolen-Hoeksema and Girgus (1994) wrote that girls develop more risk factors for depression compared to boys before adolescence, and that girls experience more interpersonal challenges in adolescence, that subsequently increase the rates of depression in girls.

Cyranowski et al. (2000) explained in their theoretical model that girls carry more risk factors than boys for depression. The model included risk factors such as negative life events, stronger gender role socialization for girls, and the factors insecure attachment and temperament. They also described that social and hormonal factors stimulate adolescent girls to try to build closer relationships with parents and peers, and if this task is not achieved, it can create depressive symptoms.

Hankin and Abramson (2001) developed a cognitive-vulnerability-transactional stress model aimed to explain the gender differences in depression in early adolescence. They emphasized that girls show a higher base rate for many of the risk factors hypothesized for depression. They mentioned negative affect, negative life events, and cognitive factors such as rumination and attributional style, and negative events happening because of larger stress generation (Strauman et al., 2011).

In the review of Hyde et al. (2008), they build on previous models trying to explain the emergence of gender difference in adolescent depression. They included affective, biological and

cognitive factors, which interact with stressful life events. The researchers explained the gender difference by postulating that girls have more vulnerability factors compared to boys. They proposed that vulnerability factors interact with stressors and this results in a negative emotional reaction that increases rates of depression especially among girls.

Developmental Psychopathology

The field of *developmental psychopathology* has become an overarching framework for understanding psychopathology, especially in children and adolescents. In developmental psychopathology the knowledge of normal development is applied onto the study of deviant populations (Cicchetti, 1989; Kazdin et al., 1997). The developmental changes that happen in adolescence are multifaceted, and involve biological, psychological, cognitive, and social changes (Cicchetti, 1989; Rudolph et al., 2006). To understand the etiology of depression in childhood and adolescence, one must take into account the different stages in development, and how they relate to the expression of depressive symptoms. Cicchetti et al. (1994) point out that there are many characteristics that are related to depression which are inevitably created in the process of development, such as negative attribution style, low self-esteem, helplessness and hopelessness, and will in themselves make the child or adolescent more vulnerable for depression (Kerig & Wenar, 2006). There are unique developmental tasks that adolescents go through, for example separating from family and building close relationships with peers. Failure to master these challenges might increase likelihood of depression.

In research on etiology of psychopathology it is now known that there are no simple causal pathways that can explain the outcome of psychopathology (Kazdin et al., 1997). Risk-factor research has been an important contribution to understanding development, dysfunction, and adaption. Risk-factor research can shine light on preceding processes of a specific outcome

as depression. A core assumption of developmental psychopathology is the concept of *multifinality*, which means that children that experience a symptom at a given time, may have different outcomes during adolescence (Kazdin et al., 1997). There is also the principle of *equifinality*, where two adolescents that have the same symptom, may have had different causal paths that have lead to this symptom. Sroufe (1997) describes how depressive symptoms for some people might be rooted in alienation and others in anxiety and helplessness. It is also recognized that there seldom is one single factor that can explain the outcome of depression in an individual. Furthermore, factors that lead to onset of depression, may not be the same as the factors that maintain depression (Avenevoli & Steinberg, 2002). In research concerning the etiology of depression, it is an ongoing challenge to differ between the factors that specifically lead to depression, rather than an overall risk for psychopathology (Rudolph et al., 2006).

Vulnerability-Stress Model

The vulnerability-stress model is another framework that is useful in understanding etiology of psychopathology, because it conceptually separates vulnerability from stress (Ingram & Price, 2010). The vulnerability-stress model entails that stress activates vulnerability factors that lies within the individual, and that this precedes onset of depression. Meehl (1962) was the first to connect the terms vulnerability and stress in his studies on etiology of schizophrenia, and this approach has been widely applied in understanding the origins of psychopathology since then (Ingram & Luxton, 2005).

Vulnerability factors are often long-standing factors within the individual that increase likelihood for maladaptation (Cicchetti et al., 1994). Sometimes, vulnerability factors have been used interchangeably with risk factors, but now most researchers distinguish between these types of factors. Risk factors could be a wide array of factors that increase the likelihood of depression

(Price & Zwolinski, 2010). Vulnerability factors are a subset of risk, where the vulnerability factors originate from within the individual, and may work as a mechanism in developing depression (Price & Zwolinski, 2010). Kerig and Wenar (2006) point out that while a risk factor would have a negative effect on all children exposed to it, a vulnerability factor increases the likelihood that a particular child will experience onset of depression. Vulnerability factors often interact with stress and in this manner increase likelihood of depression (Abela & Hankin, 2009; Hyde et al., 2008). Stress is also a broad term, which is used when referring to major negative life events, but also when referring to accumulation of minor events (Ingram & Price, 2010) The vulnerability-stress model, with vulnerability factors and protective factors include that in certain developmental periods a protective factor may be especially strong, or a vulnerability factor at a certain age may make the child or adolescent especially prone to depression (Cicchetti et al., 1994). There is yet a lot of specific knowledge about these pathways to be gained, but using this framework when studying the etiology of depression in adolescents can work as a guide in the process.

Conceptualization of Factors

In research on predictors of depressive symptoms, the predicting variables are often conceptualized as having many different roles. When using the term *predictor* it merely refers to the variable that is used to predict from, and is the same as the independent variable (Aron, Aron, & Coups, 2009). When something is conceptualized as a risk factor, this means that the presence of this factor increases the probability of a future outcome occurring (Kraemer, 2003). This does not necessarily mean that risk factors are causal factors, but rather that they are correlates where the time sequence is established (Kazdin, 2014). The terms moderator and mediator are often used in research on etiology of psychopathology. A moderator influences the relationship

between two variables, and specifies who and under what conditions a variable will produce a certain outcome (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001). There is an interaction between a factor and the moderator, which leads to a change in the outcome variable (Holmbeck, 2002). A mediator on the other hand, is assumed to account for the relationship between a factor and the outcome, and can be a guide to a possible mechanism but is not necessarily a mechanism itself (Kazdin, 2014). The predicting variable is related to the mediator, which then is related to the outcome (Holmbeck, 2002). A mechanism is the processes or events that are responsible for a change in outcome (Kazdin, 2014), and entails a greater level of specificity and knowledge than a mediator. The goal in risk factor research is to understand the mechanisms that lead to psychopathology, and discovering moderators and mediators may be a step towards this.

Objective of the Literature Search in this Review

So far, I have examined how different factors are hypothesized to explain the increase in prevalence of depression in adolescent girls. There seems to be multiple factors that contribute to this increase in depression (Abela & Hankin, 2008). Yet, it is not clear how these factors explain that the increase in depression is particularly rapid in girls. As the reviews mentioned previously indicate (Cyranowski et al., 2000; Hankin & Abramson, 2001; Hyde et al., 2008; Nolen-Hoeksema & Girgus, 1994), the work of creating meaningful theories explaining the gender differences in prevalence of adolescent depression has already started, and will hopefully be continued. However, I cannot examine all the factors that are hypothesized to impact the increase in depression through a systematic search. Further, this review will focus on how cognitive factors contribute to the increase in depression among girls in early adolescence through a systematic search. Still, the larger context that has been provided so far is crucial to understand how cognitive factors translate into depression (Price & Zwolinski, 2010).

Cognitive factors were chosen because they have an important role in the reviews mentioned earlier. To focus on girls is particularly interesting, because the increase is higher among girls compared to boys. It might also be especially important to direct prevention and treatment interventions at girls in early adolescence, before cognitive factors become stable and more difficult to change (Ames, Richardson, Payne, Smith, & Leigh, 2014; Weersing & Brent, 2010). It is important to note that while this literature review has a clear focus on girls; it will be relevant to compare girls with boys. It is not my intention to explore the possible unique developmental pathways to depression that exist for boys. Sometimes it will be relevant to examine cognitive factors that are equally important for boys and girls.

Further in this review, the aim is to examine the increase in prevalence of depression in adolescent girls, and what role cognitive factors play in this increase. One possible role cognitive factors might have, is that girls in early adolescence exhibit higher levels of negative cognitive factors, which lead to higher levels of depressive symptoms. Another possible role is that cognitive factors, together with other factors, work differently in girls compared to boys in a way that creates higher levels of depressive symptoms for girls.

Method

The following databases were searched for relevant English-language articles: PsychInfo, ISI Web of Science, and PubMed in the period 2000 to 2014. The databases were chosen because they are widely recognized in the fields of psychology, psychiatry and health sciences, and cover the majority of published and peer reviewed research. The time-frame was chosen because researchers have used longitudinal designs much more often after 2000, and the research is currently more targeted at the temporal relationship between a predicting factor and the outcome (Hyde et al., 2008). The research in this time frame also gathers more information about gender

and age, and this is included in the results. Cross-sectional research on the other hand, describes correlations between different factors, but whether certain factors precede an outcome, cannot be answered. This literature study focuses on longitudinal prospective studies because they follow participants over time, and in this way can discover what factors precede a certain outcome (Kazdin, 2003; Kraemer, 2003). A longitudinal study means that you collect data about a group at several time points, and a prospective study means that the group is followed over time, rather than as in retrospective studies, where you collect data about events that already happened (Kazdin, 2003). In longitudinal studies, different variables can be tracked over time, and it is therefore possible to learn about varying developmental pathways to depression.

The search did not include unpublished material. Keywords in 6 different categories were used, as stated in table 1.

Table 1

Overview of keywords

Category 1	Category 2	Category 3	Category 4	Category 5	Category 6
depress*	adol*	girl*	«cognitive factors»	vulner*	longitudinal
MDD	youth	female	ruminat*	pathway	prospective
	teen*	gender	attribut*	develop	
	child*	sex	cognit*	risk	
			hopelessness		
			helplessness		

Note. The keywords within each category were combined with «OR». The categories were then combined with "AND".

The keywords in the six categories were used in a search based on article keywords, abstracts and titles. The keywords from category 1 were used to include articles that looked at

depressive symptoms, as well as the DSM diagnosis MDD. In category 2 the aim was to find articles that focused on early adolescence or the transition from childhood into adolescence. The keywords in category 3 were used to obtain articles that focused on girls, or that separated between the genders in their statistical analysis. In category 4 the idea was to search broadly on cognitive factors, as well as other more specific cognitive factors. In category 4 and 5 the aim was to find the articles with the suitable research design. In order to exclude articles that were not on the topic of depression, the search based on keywords, abstracts and titles were combined with a search based on titles using only the keywords "depress*" and "MDD".

The literature search identified 495 possible relevant articles. The inclusion criteria were that the articles had to be longitudinal prospective studies that had collected information about the participants at minimum twice, to be able to establish a temporal relationship between the predicting factors and onset of depression. The participants had to be measured while they still were children, and into adolescence, or they could be measured at different times during adolescence. This article focuses on early adolescence which can be defined as 12-14 years (Garber, 2010). In this period, the increase in depression prevalence and the gender difference start to emerge. Focusing on early adolescence makes it easier to capture the changes that happen in this developmental period, which are relevant for early onset of depression. To ensure this focus, one of the criteria was that the mean age of the participants had to be below 15 years of age at first measurement. Articles that focus on late adolescence ($M \geq 15$) were excluded. The studies in question must have used a community sample rather than an inpatient or clinical sample. This selection was made because samples collected from a clinic might be a different population compared to a community sample, with more severe symptoms and possibly different etiology (Kazdin, 2003). The articles had to study cognitive factors, which could be attribution,

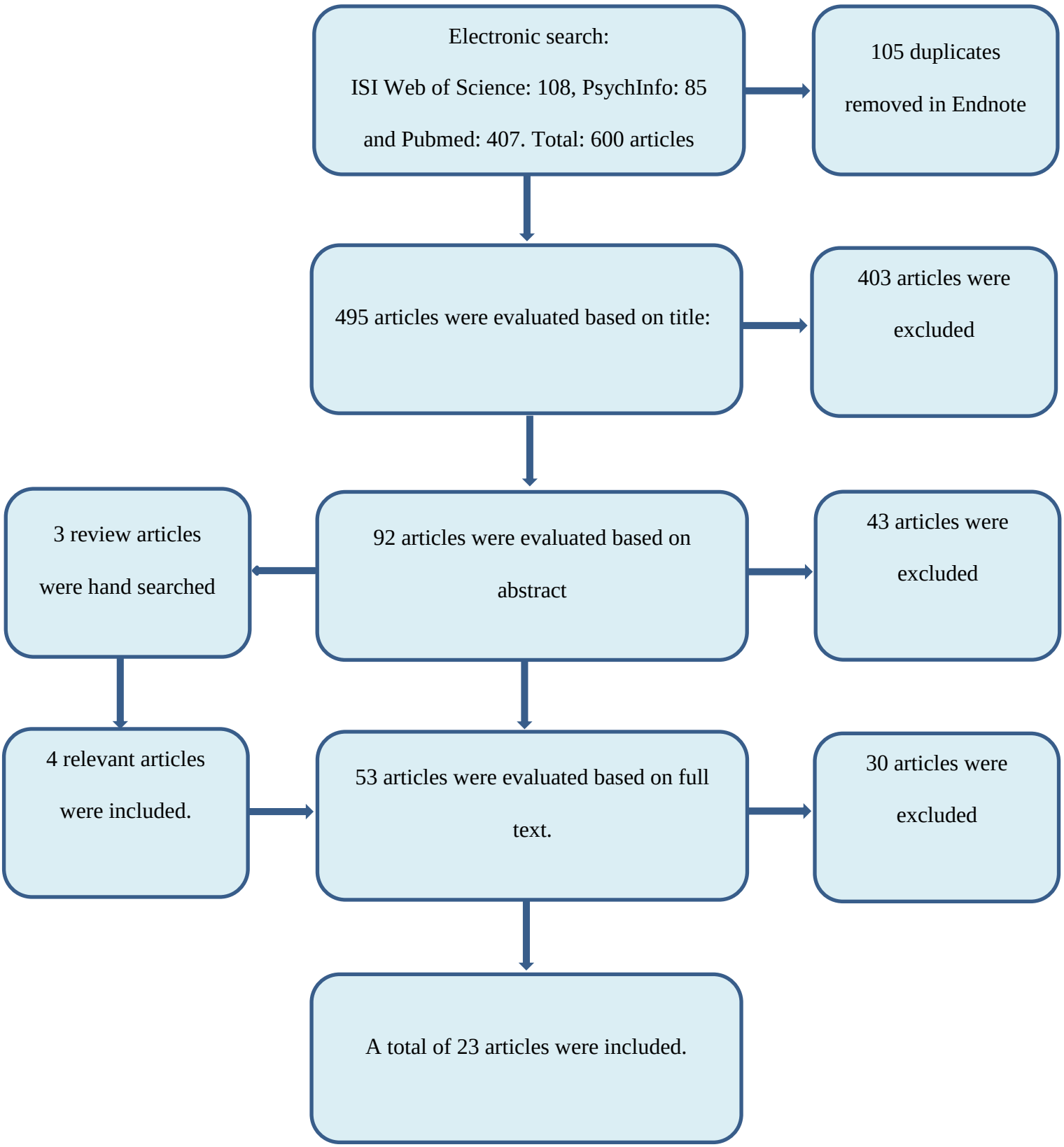
rumination, memory, or other cognitive factors. It was decided to exclude articles regarding self-esteem or self-worth, because these are often not only conceptualized as cognitive factors, but also entail social and emotional dimensions (Tafarodi & Milne, 2002). Literature reviews, dissertations, and cross-sectional studies were excluded, but literature reviews were hand searched for relevant articles and used as background literature. From February 2014 until March 2014 a "citation alert" was active based on the searches in PsychInfo, ISI Web of Science and, PubMed. No new articles were included in this period.

Result

The search yielded 85 articles in PsychInfo, 108 articles in ISI Web of Science, and 407 articles in PubMed. All 600 articles were imported into Endnote (windows version x7), and after duplicates were removed, there were 495 articles left. See Figure 1 for description of the inclusion process. An overview of the exclusion categories is presented in Appendix B1.

In total, three review articles were hand searched for relevant articles for the present literature review (Hankin et al., 2009; Jacobs, Reinecke, Gollan, & Kane, 2008; Rood, Roelofs, Bogels, Nolen-Hoeksema, & Schouten, 2009). Especially Jacobs et al. (2008) and Rood, Roelofs, Bogels, et al. (2009) were found relevant as background literature. Jacobs et al. (2008) reviewed longitudinal studies of the cognitive factors attributional style, dysfunctional attitudes, self-perceptions, and information processing, and their prospective effect on depressive symptoms in children and adolescents. The present literature review differs from Jacobs et al. (2008) in several ways. First, the inclusion criteria are different; the present literature review has a specific focus on early adolescence, and has only included articles with a community sample.

Figure 1. Flowchart describing the inclusion process.



There are also other cognitive variables included, such as overgeneral autobiographical memory, cognitive ability, and rumination, and the cognitive factor self-perception has been excluded. The goal of this literature study is to look at how cognitive factors can explain the rapid increase in depression among girls in early adolescence. Jacobs et al. (2008) do not explicitly discuss the difference in prevalence between girls and boys in early adolescence. In the meta-analytic review of Rood, Roelofs, Bögels, Nolen-Hoeksema, and Schouten (2009), they focus on rumination as a predictor of depression in youth. They also focus on gender differences in rumination and symptoms of depression. Meanwhile, the present literature study look at a broader range of cognitive factors, and again has stricter criteria when it comes to age-span. Also, it is worth noting that several of the articles included in the present literature study have been published after 2008-2009.

The majority of the articles included collected data from samples in the United States, but Canada, the UK, Spain, Belgium, New Zealand and Australia were also represented. Most of the studies measured depressive symptoms through self-measure instruments, but some measured depressive symptoms through standardized clinical interviewing (Abela & Hankin, 2011; Stange et al., 2013).

In Table 2 there is an overview of the articles included with demographic data, time lap between measurements, cognitive variables, other relevant variables included in the articles, and measurement instruments used for cognitive variables and depressive symptoms.

Table 2

Overview of the Included Articles: Demographic Data, Time Lap Between Measurements, Cognitive Variables and Other Variables

Author(s) / Year	N	Time lap between measurements	Age/(Mean) at time of first measurement	Cognitive variable(s)	Measurement of cognitive variables(s)	Hypothesized role of cognitive variable(s)	Other variables	Measurement of depressive symptoms:
Spence et al., 2002	994 (45.0% girls)	1 year, 2 times in all	12-14 (12.91)	Attributional style	CASQ-R	Moderators	Social problem solving, negative life events	BDI
Abela & Sullivan, 2003	184 (42.4% girls)	6 weeks, 2 times in all	12-13 (12.8)	Dysfunctional attitudes	CDAS	Vulnerability factors	Social support, self-esteem	CDI
Burwell & Shirk, 2007	168 (58.3% girls)	Every 6-8 months. 3 times in all	12-15 (13.58)	Rumination subtypes: brooding and reflection	Ruminative Response Scale	Predictors	Coping	CDI, CDRS, Mood and Conduct Checklist
Calvete et al., 2007	1187 (45,9% girls	Every 6 months. 2 times in all	13-17 13.42)	Maladaptive cognitive schemas, negative interferential style	YSQ-SF, ACSQ	Vulnerability factors	Stressors	CES-D
Grabe et al., 2007	299 (52.8 % girls)	2 years, 2 times in all	10-12 (11.24)	Rumination	RSQ	Mediator	Body objectification, shame	CDI
Nolen-Hoekseme et al., 2007	496 (all girls)	1 year, 4 times in all	11-15 13.50)	Rumination	RRS	Predictor	Bulimia, Substance abuse	K-SADS
Hankin, 2008	350 (57% girls)	5 months, every 5 weeks, 4 times in all	11-17 (14.50)	Negative inferential style	ACSQ, CRSQ	Vulnerability factor	Negative life events	CDI, MASQ

Author(s) / Year	N	Time lap between measurements	Age/(Mean) at time of first measurement	Cognitive variable(s)	Measurement of cognitive variables(s)	Hypothesized role of cognitive variable(s)	Other variables	Measurement of depressive symptoms:
Stange et al., 2008	174 (57.9 % girls)	8 months, 2 times in all	12-13 (12.31)	Overgeneral autobiographical memory	AMT	Vulnerability factor	Emotional maltreatment	CDI, K-SADS-E
Cole et al., 2009	593 (56.0% girls)	Once a year for 4 years	9-12[a]	Depressive cognitive schemas	CTI-C	Vulnerability factor	Self-perceived competence	CES-DC, CDI
Hankin, 2009	350 (57.0% girls)	5 months, every 5 weeks, 4 times in all	11-17 (14.5)	Rumination, Negative cognitive style, dysfunctional attitudes	CRSQ, ACSQ, Dysfunctional Attitudes Scale,	Vulnerability factors	Stressors	CDI, MASQ
Verstraeten et al., 2009	304 (58.8% girls)	1 year, 2 times in all	11.5-17.9 (14.26)	Rumination, Effortful control	CRSQ, ECS	Mediator, moderator	Temperament	BDI-II
Glaser et al., 2010	5250 (50.7% girls)	3 years and every year. 5 measurements in all	8[a]	Cognitive ability	WISC-III	Risk factor	Puberty	SMFQ
Lee et al., 2010	350 (54.6% girls)	5 weeks, 3 times in all	11-17 (14.50)	Negative cognitive style	ACSQ	Moderator	Perceived social competence, negative social interactions	CDI
Mezulis et al., 2010	301 (52.5%)	2 years, 2 times in all	13 (13.52)	Rumination	RRS	Mediator	Infant temperament	CDI
Abela & Hankin, 2011	382 (58.9% girls)	Every 3 months and every 6 months for 2 years	11-15 (12.59)	Rumination	CRSQ	Vulnerability factor, moderator, mediator	Negative events	CDI and K-SADS

Author(s) / Year	N	Time lap between measurements	Age/(Mean) at time of first measurement	Cognitive variable(s)	Measurement of cognitive variables(s)	Hypothesized role of cognitive variable(s)	Other variables	Measurement of depressive symptoms:
LaGrange et al., 2011	515 (55.5% girls)	Once a year for 4 years	7-11[a]	Maladaptive cognitions	CTI-I, ATQ	Predictor	--	CDI, CES-DC
Rueger & Malecki, 2011	497 (51.7% girls)	4 months, 2 times in all	12-15 (13.2)	Attributional style	CASI-II	Vulnerability factor	Stress, perceived parental support	CES-DC
Kim-Spoon et al., 2012	431 (51.30% girls)	First after 6 months, than after 2 years. 3 times in all	13-14 (13.62)	Attributional style	CASQ-R	Moderator	Perceived competence	RADS
Felton et al., 2013	239 (56% girls)	6 months, and 10 days, 2 times in all	10-15 (11.27)	Rumination	RSQ	Vulnerability factor	A natural disaster	CDI
Jose & Keir, 2013	976 (46% girls)	4 months, 2 times in all	11-16 (13.14)	Rumination subtypes: brooding, reflection	RSQ	Predictors	Anxiety	CDI
Michl et al., 2013	1065 (48.8% girls)	3 times during 7 months	12 (12.2)	Rumination	CRSQ	Mechanism	Stressful life events	CDI
Auerbach et al., 2014	157 (59.2% girls)	Every 6 weeks for 6 months	12-18 (13.99)	Negative cognitive style	ACSQ	Predictor, vulnerability factor, mediator	Self-criticism, dependency, negative life-events	CES-D
Hamlat et al., 2014	160 (43.8% girls)	9 months, 2 times in all	12-13 (M = 12.44)	Rumination, overgeneral autobiographical memory	CRSQ, AMT	Vulnerability factors	Stressful life events	CDI

Note: CASQ-(R) = The Children`s Attributional Style Questionnaire – (Revised); BDI = Beck Depression Inventory; CDAS = Children's Dysfunctional Attitudes Scale; CDI = Children`s Depression Inventory; CDRS = Children`s Depression Rating Scale-Revised; YSQ-SF = Young Schema Questionnaire; ASCQ = Adolescent Cognitive Style Questionnaire;); CES-D(C) = Center for Epidemiologic Studies Depression Scale (for Children); RSQ = The Response Style Questionnaire; RRS = Ruminative Response Scale; K-SADS-(PL)/(E) = Kiddie-Schedule for Affective Disorders and Schizophrenia (Present and Lifetime)/(Epidemiological Version; CRSQ = Children`s Response Styles Questionnaire; MASQ = Mood and Anxiety Symptom Questionnaire; AMT = Autobiographical Memory Task; CTI-C = The Cognitive Triad Inventory for Children; ECS = Effortful Control Scale; WISC-III = Wechsler Intelligence Scale for Children; SMFQ = Short Mood and Feelings Questionnaire; ATQ = Automatic Thoughts Questionnaire; RADS = Reynolds Adolescent Depression Scale.

[a]Mean age not available in the article.

The Response Style Theory - Rumination

In total 11 articles studied rumination as a cognitive factor predicting depressive symptoms. All studies that focused on rumination within the response style theory found that rumination had a prospective impact on depressive symptoms

Burwell and Shirk (2007) examined the rumination subtypes brooding and reflection, and the longitudinal relationship with depressive symptoms. They found that brooding, but not reflection predicted development of depressive symptoms. The levels of brooding and depressive symptoms were similar among boys and girls, but brooding mediated the increase in depressive symptoms only for girls.

Grabe, Hyde, and Lindberg (2007) investigated the impact body shame and rumination had on the relationship between self-objectification and depression among early adolescents. They found that 13 year old girls exhibited higher levels of body-shame, self-surveillance, rumination and depressive symptoms compared to boys. Self-surveillance means monitoring the appearance of your own body, which can lead to shame and anxiety for not looking good enough. Their investigation supported that body shame and rumination could partly explain the relation between self-objectification and depression among girls. They also found that self-surveillance predicted levels of rumination. Their effects were moderate, and not all variation in depressive symptoms could be explained by self-surveillance, body-shame and rumination.

Nolen-Hoeksema, Stice, Wade, and Bohon (2007) examined the prospective effect rumination had on depression in female adolescents. They found that girls with higher levels of rumination at first measurement had a higher probability of developing episodes of major depression over the 4 years of the study.

Hankin (2009) studied how the interaction between rumination and stress was related to depressive symptoms in early and middle adolescence. The interaction between rumination and stress was found not to account for the gender difference in depressive symptoms over time, only for depressive symptoms measured at the beginning of the study. Girls exhibited higher levels of depression, stress and rumination.

Verstraeten, Vasey, Raes, and Bijttebier (2009) investigated how rumination might mediate the relationship between negative emotionality and depressive symptoms. They also examined how effortful control could work as a moderator on the mediation role rumination had on the relationship between negative emotionality and depressive symptoms. Effortful control entails self-regulatory processes such as controlling behavioral and emotional responses. The hypothesis that rumination worked as a mediator on the relationship between negative affectivity and depressive symptoms was supported. This effect was stronger in those scoring low on effortful control, suggesting a moderating effect. They found that girls showed higher levels of rumination at first measurement, and that negative affectivity was more strongly related to depressive symptoms in girls compared to boys. However, they did not find a gender difference in level depressive symptoms in second measurement.

Mezulis, Priess, and Hyde (2011) examined the mediation role rumination had on the relationship between infant temperament and depressive symptoms. Their results showed that negative emotionality measured in infancy predicted rumination levels at age 13 only for girls, but there were no differences in negative emotionality in infancy among girls and boys. They also found a significant path from rumination at age 13 to depressive symptoms as age 15 only among girls. When rumination was included in the statistical model, the relationship between negative emotionality measured at infancy and depressive symptoms at age 15 was not

significant. This supports the mediating role of rumination. This again, was only significant among girls. Further, they did not find a relationship between negative emotionality in infancy and rumination at age 13 among boys, and the relationship between rumination and depressive symptoms at age 15 was not significant among boys.

Abela and Hankin (2011) investigated rumination as a vulnerability factor to depression in early and middle adolescence. They found that higher levels of rumination were associated with a higher probability of onset of a major depressive episode after 2 years. Adolescents that reported higher levels of rumination also reported higher levels of depressive symptoms after experiencing negative life events, supporting a vulnerability-stress model of depression. They found a gender difference when it came to levels of depression, where girls were twice as likely as boys to experience a depressive episode at the last measurement. However, they found no gender differences when it came to level of rumination or level of experienced negative life events, nor was there any support for gender as a moderator of the relationship between rumination and depressive symptoms.

Felton, Cole, and Martin (2013) examined effects of rumination on depressive symptoms after the 2010 Nashville flood, a natural disaster. The level of pre-flood rumination enhanced the effects of the flood on depressive symptoms for adolescents but not children. They also found that the severity of flood-experiences and post-flood rumination predicted depressive symptoms after the flood. They did not find any gender differences in any of the predictors, nor interactions between any of the predictors.

Jose and Weir (2013) studied the relationship between the rumination subtype brooding and depressive symptoms in adolescence and how anxiety was involved in this relationship. Brooding rumination was found to predict depressive symptoms. They found that by the age of

13 years, girls engaged in more brooding rumination than boys. They also found that girls reported higher levels of depressive symptoms compared to boys from age 14. Jose and Weir (2013) tested if anxiety worked as a mediator between brooding rumination and depressive symptoms, but found that both brooding rumination and anxiety had unique contributions to changes in depressive symptoms.

Michl, McLaughlin, Shepherd, and Nolen-Hoeksema (2013) evaluated rumination as a mechanism linking stressful life events to depressive symptoms among adolescents. They found that girls reported higher levels of rumination and depressive symptoms, while the level of negative life events was the same for girls and boys. Rumination predicted depressive symptoms. They tested whether rumination worked as a mediator on the relation between stressors and depressive symptoms, and although they found a pattern supporting this, the effect was not statistically significant. They found no gender difference in rumination linking stressful life events to onset of depressive symptoms.

Hamlat et al. (2014) investigated the cognitive vulnerabilities rumination and overgeneral autobiographical memory and their relationship to depression. Their study supported that rumination predicted depressive symptoms. They found no gender differences in level of rumination, overgeneral autobiographical memory, nor depressive symptoms, however they found that girls exhibited higher levels of stressful life events between the first and second measurement. They found that girls with more overgeneral autobiographical memories, combined with higher levels of rumination, were most vulnerable to experiencing depressive symptoms after negative life events. This interaction was not significant for boys, even though they had the same levels of overgeneral autobiographical memory

The Hopelessness Theory – Attributional Style, Cognitive Style, and Inferential Style

Of all the articles, eight articles investigated cognitive factors within the hopelessness theory. How these factors were conceptualized varied in the articles. Some articles used negative attributional style, and others used negative cognitive style or negative inferential style as the cognitive factors. All eight studies reported a relationship between either attributional style, cognitive style, or inferential style and prospective depressive symptoms.

Spence, Sheffield, and Donovan (2002) studied how problem-solving orientation and attributional style could work as moderators on the impact negative life events had on development of depressive symptoms. They found an interaction between negative problem-solving orientation and negative life events, in predicting onset of depressive symptoms. They also found that pessimistic attribution style predicted future increase in depressive symptoms, also without the occurrence of negative life events. Attribution style did not interact with negative life events to predict increase in depressive symptoms, and did not work as a moderator, neither in girls nor boys. This does not fit into the vulnerability-stress model of depression. Girls were more likely to exhibit higher levels of negative problem-solving orientation and depressive symptoms.

Rueger and Malecki (2011) examined the impact of stress, attributional style, and perceived parental support on depressive symptoms in early adolescence. They found that girls with a pessimistic attributional style and low or moderate levels of perceived parental support had higher levels of depressive symptoms than those with a more positive attributional style. Level of stress did not impact this relation. Also, attributional style moderated the relationship between stress and depressive symptoms for girls. Girls exhibited more negative life events and more depressive symptoms at the second measurement.

Kim-Spoon et al. (2012) investigated the moderating role of attributional style on the relationship between perceived competence and depressive symptoms among adolescents. They found that for girls with a negative attributional style, lower perceived competence in physical appearance predicted prospective depressive symptoms. Also, they found that for both genders depressive attribution style moderated the relationship between perceived athletic competence and depressive symptoms. They found that boys and girls did not differ in levels of depressive attributional style, Girls showed higher levels of depressive symptoms in all measurements. Boys showed higher levels of perceived athletic and physical appearance competence, compared to girls, but the genders showed similar levels in perceived social acceptance.

Hankin (2008a) investigated whether negative inferential style, interacted with stress to create prospective increases in depressive symptoms. He found support for this interaction. Hankin (2008a) also found that negative inferential style predicted increase in depressive symptoms as a main effect. Also, he found that this was specific for depression, and did not hold for anxious arousal nor general internalizing and externalizing symptoms. Another finding was that the interaction between negative inferential style and stress in predicting increases in depression was the same for girls and boys.

Hankin (2009) examined the interaction between negative cognitive style and stress and the longitudinal impact on depressive symptoms among adolescents. This interaction was supported. Hankin (2009) also found that this interaction could explain some of the gender difference in the prospective onset of depressive symptoms. Girls had higher increases in depressive symptoms over time. Negative cognitive style alone could not explain any of the variation between the genders.

Lee, Hankin, and Mermelstein (2010) studied how negative cognitive style would moderate the prospective relationship between negative interactions with parents, and increases in depressive symptoms. They found that negative cognitive style interacted with higher levels of negative parental interactions to increase depressive symptoms. The effect of this interaction was stronger than negative cognitive style or negative interactions with parents alone. They did not find that gender moderated this relation.

Calvete et al. (2013) examined the relationship between the cognitive factors maladaptive cognitive schemas and negative inferential style, stressors and depressive symptoms in adolescence. They found that negative inferential style predicted increases in depressive symptoms, alone and together with stress. There were no significant gender differences in inferential style.

Auerbach et al. (2014) examined the impact negative cognitive style, self-criticism and dependency had on depression in adolescence. They found that higher levels of interpersonal stressors mediated the relationship between negative cognitive style and depressive symptoms. They found no gender differences.

Beck`s Theory of Depression - Maladaptive Cognitive Schemas and Dysfunctional Attitudes

Five articles examined cognitive factors within Beck`s Theory of Depression. One article (Hankin, 2009), studied both rumination and maladaptive schemas, and is presented in both sections. The article of Calvete et al. (2013) has been mentioned earlier, because they also examined inferential style, in addition to maladaptive schemas. All studies found that maladaptive schemas, negative cognititions, or dysfunctional attitudes had a longitudinal impact

on depressive symptoms, except from LaGrange et al. (2011), that found that maladaptive cognitions did not predict prospective symptoms of depression.

Abela and Sullivan (2003) examined if dysfunctional attitudes worked as a vulnerability factor for depressive symptoms in early adolescence, and if dysfunctional attitudes interacted with negative events to predict depressive symptoms. They found support for this interaction. When looking closer at the depressive symptoms, they found that dysfunctional attitudes, predicted specific aspects of depressive symptoms such as negative views of the self and acceptance by others. Dysfunctional attitudes did not predict depressive symptoms such as sadness, anhedonia, sleep disturbance, or changes in appetite. They found no gender differences in any of their measures.

Cole et al. (2009) evaluated how negative cognitive schemas were related to depressive symptoms in children and adolescents. They found similar levels of negative cognitive schemas (cognitions about self, world and the future) among girls and boys. However, negative cognitions were found to be more "trait-like" in girls, meaning that they were more stable throughout the four years the study was conducted, and more perceived as personal characteristics. For boys, negative cognitions were more related to situational factors. Negative cognitions were found to have a stronger relationship with depressive symptoms by each measurement (1 year between).

Hankin (2009) investigated the relationship between dysfunctional attitudes and stress, and the prospective relation with depressive symptoms. Negative dysfunctional attitudes had a prospective relation with depressive symptoms. Hankin (2009) investigated whether dysfunctional attitudes could explain why girls have higher levels of depression. He found that boys exhibited higher levels of dysfunctional attitudes, and did therefor not include the relationship between dysfunctional attitudes and stress in his mediation analyses. The result

indicated that dysfunctional attitudes did not work as a mediator for the gender difference in depressive symptoms.

LaGrange et al. (2011) investigated the prospective relationship between maladaptive cognitions and depressive symptoms. They did not find that maladaptive cognitions predicted onset of later depressive symptoms. They did not find any differences between the genders.

As mentioned earlier, Calvete et al. (2013) examined the relationship between the cognitive factors maladaptive cognitive schemas and negative inferential style, stressors and depressive symptoms in adolescence. They also found that maladaptive schemas in the domain of disconnection and rejection, predicted increases in depressive symptoms, alone and together with stress. Girls exhibited higher levels of maladaptive schemas and depression. They found the same level of stress in boys and girls.

Overgeneral Autobiographical Memory

There were two articles that examined overgeneral autobiographical memory. Hamlat et al. (2014) was discussed earlier, because it also examined rumination.

Hamlat et al. (2014) investigated the effect rumination and overgeneral autobiographical memory had on depressive symptoms. Their findings indicated that ovegeneral autobiographical memory worked as vulnerability factor for depressive symptoms, especially for girls. Among girls with high levels of overgeneral autobiographical memory, that also had higher levels of rumination, experienced increase in depressive symptoms when facing stressful life events. This was not evident for boys.

Stange et al. (2013) evaluated whether overgeneral autobiographical memory and familial emotional maltreatment may interact and predict depressive symptoms in early adolescence. They reported that adolescents that experienced emotional abuse, and had higher levels of

overgeneral autobiographical memory, had higher levels of depressive symptoms, compared to those who also experienced emotional abuse, but had lower levels of autobiographical memories. They found that girls exhibited higher levels of overgeneral autobiographical memory, as well as higher levels of emotional abuse, and higher levels of depressive symptoms at follow-up measurement, compared to boys.

Cognitive Ability

One article examined cognitive ability and the prospective increase in depressive symptoms.

Glaser et al. (2011) investigated the prospective impact cognitive ability in childhood had on depressive symptoms at age 11, 13-14, and 17 years. They found that high IQ at age eight was negatively related to depressive symptoms at age 11, while at age 13 and 14, higher IQ score was associated with higher levels of depressive symptoms. At age 17, a gender difference emerged. For boys, high IQ at age eight was still associated with depressive symptoms at 17, while for girls this pattern was no longer evident. They found that girls had more depressive symptoms compared to boys from 13 years. They also investigated the association between puberty and IQ and the impact on depressive symptoms, and found a significant interaction between pubertal stage and IQ, so that timing of puberty was important for what age cognitive ability was associated with depressive symptoms.

Discussion

The cognitive factors were found to play several different roles, and interact with other important factors such as biological (puberty), interpersonal (negative interactions with parents), stressful life events and gender role expectations (body ideals). The articles yielded different findings, when it comes to the impact cognitive factors have on the increase among girls in early

adolescence. It is therefore hard to draw clear conclusions about how cognitive factors contribute to the increase in depression among adolescent girls.

In this section I will outline what different roles the cognitive factors were found to have, whether they were found to be predictors, mediators, moderators or vulnerability factors. Then I will discuss what the article`s findings can say about possible ways cognitive factors can contribute to the increase in depression in early adolescence among girls. An interesting question is if cognitive factors work differently for girls and boys, and thereby increase levels of depressive symptoms especially in girls. Another question is if girls have higher levels of cognitive factors, and if this can contribute to the increase in depressive symptoms among girls.

Different Roles of Cognitive Factors

The response style theory – rumination. Some of the studies examining rumination found that rumination worked as a mediator, others found that rumination worked as a predictor for depressive symptoms. It was also found that rumination fit into a vulnerability-stress model, and one study found that rumination worked as a moderator on the relationship between flood severity-experiences and depression (Felton et al., 2013). This demonstrates the different roles cognitive factors can take, but it also poses a challenge to understand the specific role cognitive factors have on the increase in depression in early adolescence, particularly among girls. This could indicate that rumination is an especially important cognitive factor that plays different parts to increase levels of depressive symptoms.

The hopelessness theory – attributional style, cognitive style, and inferential style. The research within the hopelessness theory yielded support for multiple ways attributional style, negative inferential style, and negative cognitive style exerted an impact on depressive symptoms. Mediation, moderation, prediction, and a vulnerability-stress relationship were

different roles the cognitive factors were found to have in predicting depressive symptoms. Again, it is difficult to say that cognitive factors had a specific role in the increase of depressive symptoms in girls; studies find support for several roles.

**Beck`s theory of depression - maladaptive cognitive schemas, and dysfunctional attitudes.** In Beck`s theory of depression, the cognitive factors were found to work as a predictor and a vulnerability factor in a vulnerability-stress model. Interestingly, it was found not to work as a mediator of the increased level of depressive symptoms in girls, because boys had higher levels of dysfunctional attitudes compared with girls (Hankin, 2009). Even though this finding should be replicated, it is interesting that they found that dysfunctional attitudes did note mediate the increase in depression among adolescent girls. Dysfunctional attitudes might not be uniquely related to the increase in depression in girls.

Overgeneral autobiographical memory. Both studies examining overgeneral autobiographical memory found that it functioned as a vulnerability factor that interacted with stress. Although more research is needed on overgeneral autobiographical memory as a risk factor for depression in early adolescence, these studies suggest that this cognitive factor can be important to include when examining different pathways to depression. It could be that negative life events have greater impact on depressive symptoms when girls have an overgeneral autobiographical memory, where single events are recalled as general events.

Cognitive ability. According to Glaser et al. (2011), the timing of puberty is important in understanding how cognitive ability is related to depressive symptoms. Early timing of puberty has been linked with lower cognitive ability, while later timing of puberty has been linked with higher cognitive ability. In this vein, the timing of puberty mediates the increases in depressive symptoms, rather than cognitive ability in itself. Onset of puberty has been found to increase the level of stress in young girls, and can therefore increase levels of depression. At age 17, girls are at the end of pubertal development, and Glaser et al. (2011) found that lower cognitive ability was related to higher levels of depressive symptoms. It is possible that after puberty, higher cognitive ability will not be related to depression, because higher cognitive ability enhances problem solving and coping in meeting with stress. The authors also emphasize that before and during puberty, the brain is more sensitive to stress, and has a prolonged stress reaction. This could also explain why timing of puberty is important for onset of depressive symptoms.

This finding adds to the complexity of how cognitive factors can contribute to the increase in depressive symptoms in girls in early adolescence. This also points to the importance of integration of different factors in the understanding of risks for depression in adolescence. It must be noted that this is only one study, so the relationship between onset of puberty, cognitive ability and depressive symptoms must be replicated in more studies.

How Can Cognitive Factors Contribute to the Increase in Depression Among Girls in Early Adolescence?

There is no single cause for the onset of depression, and it is unlikely that there exists one single cause for the increase in depression among adolescent girls. Cognitive factors are still under construction during early adolescence, and this developmental period may be a vulnerable time for cognitive risk factors to emerge (Beck, 1970). All studies in this review found that the

cognitive factors did have an impact on prospective depressive symptoms, except one (LaGrange et al., 2011), supporting that cognitive factors are important in understanding the increase in depression among adolescents. Also, LaGrange et al. (2011) emphasize that the lack of impact maladaptive schemas had on depression in their study should be interpreted with caution. They had a time lag of 1-year between the four measurements, and it might be that the optimal time-range for detecting maladaptive cognitive schemas impact on depressive symptoms is shorter.

Do cognitive factors work differently for girls and boys? Cognitive factors can be differently related to depression for girls and boys, so that similar cognitive processes might have different effects on girls and boys, and may lead to the increase in depression among adolescent girls. This is in accordance with a moderation model, where the cognitive factors are more strongly related to depressive symptoms among girls (Abela & Hankin, 2011).

Several studies found that the cognitive factors worked differently for girls, compared to boys, where girls and boys had the same level of that cognitive factor initially. This indicates that it is not the higher level of the cognitive factors that led to the cognitive factors` effect on depressive symptoms, but that the cognitive factors had different impact, dependent on gender. Burwell and Shirk (2007) found that brooding worked as a mediator only for girls. Further, Rueger and Malecki (2011) found that attributional style worked as a moderator on the relationship between stress and depressive symptoms only for girls. They also found that low or negative perceived parental support together with negative attributional style led to depressive symptoms only in girls. This indicates that lack of social support from parents could be more important for girls, and could together with negative attributional style lead to increases in depressive symptoms. Also Kim-Spoon et al. (2012) found that negative attributional style worked as a moderator, and moderated the relationship between perceived physical appearance

and depressive symptoms only in girls. Hamlat et al. (2014) found that girls with more overgeneral autobiographical memories and with higher levels of rumination were most vulnerable to depressive symptoms after negative life events. This interaction was not significant in boys. Furthermore, Cole et al. (2009) found that negative cognitions were more "trait-like" in girls, where as in boys the negative cognitions were more related to situational factors. If the negative cognitions are more trait-like for girls, it is likely that they have a bigger impact on depressive symptoms in girls over time.

The articles mentioned above indicate that even though girls and boys had similar levels of the cognitive factors initially, they impacted girls in a different way. Kim-Spoon et al. (2012) had some interesting findings, were girls and boys had the same level of negative attributional style, but where negative attributional style moderated the relationship between perceived physical appearance and depressive symptoms only for girls. When they examined perceived athletic style, they found that negative attributional style worked as a moderator in both girls and boys.

There were also, however, several articles that found that girls and boys exhibited the same level of the cognitive factors investigated, and where the cognitive factors impacted the prospective depressive symptoms the same way for girls and boys (Abela & Hankin, 2011; Abela & Sullivan, 2003; Auerbach et al., 2014; Felton et al., 2013; Spence et al., 2002). These findings may reflect the developmental period, where the gender differences in prevalence of depression have not yet emerged. They may also reflect that some cognitive factors are similar for boys and girls, and lead to depression in the same way.

Do girls have higher levels of cognitive factors than boys? It is possible that one of the reasons why girls have more depressive symptoms than boys, is that they have higher levels of

different cognitive risk factors that are related to depression. This would be in lines with a mediational model, where higher levels of the cognitive factors lead to higher levels of depressive symptoms (Abela & Hankin, 2011).

Grabe et al. (2007) found that girls exhibited higher levels of brooding, and also that brooding rumination together with body shame partly mediated the relationship between self-objectification and depression in girls. Hankin (2009) found higher levels of a negative cognitive style among girls, and this together with stress could account for some of the gender difference in depressive symptoms over time. Interestingly, Mezulis, Priess, et al. (2011) found that girls exhibited higher levels of rumination, and that rumination mediated the relationship between infant temperament and depressive symptoms only among girls. Verstraeten et al. (2009) also found that girls had higher levels of rumination; They found that rumination mediated the effect of negative emotionality on depressive symptoms among both genders, but that this effect was stronger among girls.

Some studies also found higher levels of the cognitive factors in girls, without finding a difference in girls and boys when it came to the effect these cognitive factors exerted on depressive symptoms (Calvete et al., 2013; Jose & Weir, 2013; Michl et al., 2013; Stange et al., 2013) Only one study found that boys had higher levels of a cognitive factor, which was maladaptive cognitive schemas (Hankin, 2009).

Altogether, this lends some support to the notion that higher levels of cognitive vulnerabilities lead to higher levels of depressive symptoms among girls compared to boys. One reason that some studies found that girls had higher levels of the cognitive factors, but no gender difference in how these factors impacted depressive symptoms, could be the time of measurements. It is possible that the higher levels of cognitive vulnerabilities could lead to

depressive symptoms when the girls are older. This is in accordance with research that shows that depressive symptoms in girls increase throughout adolescence, and that the gap between the genders also increases throughout adolescence (Garber, 2010).

Even though there were studies supporting that cognitive factors work differently for boys and girls, and that girls` higher levels of cognitive factors could lead to the increase in depression among girls, there were approximately the same number of articles that found that these cognitive factors contributed to depression in the same way for girls and boys. This makes it hard to draw conclusions about what specific role cognitive factors have in the increase in depressive symptoms among girls in early adolescence. However, it seems like cognitive factors do not impact depressive symptoms in girls only in one way – but several ways. It seems likely that some cognitive factors do contribute to the increase in depression especially among girls, but also that some cognitive factors predict depressive symptoms in both girls and boys. Anyhow, it is too early to conclude what specific contribution cognitive factors have on the increase in prevalence of depression among girls in early adolescence.

Possible pathways to depression. The articles included in this literature review suggest that there exist different pathways to onset of depression, and that some of these might be unique for girls. This is also consistent with the concept of equifinality, where different pathways may lead to the same outcome. Cicchetti and Toth (1998) emphasize that it is important to reveal different pathways to depression. There seems to be several other types of factors that work together with cognitive factors, that are especially potent in predicting depression, and that suggest unique pathways to depression for girls.

Body image and physical appearance. Both Grabe et al. (2007) and Kim-Spoon et al. (2012) found that body image and physical appearance together with cognitive factors predicted

depression in girls, particularly. Physical appearance is found to matter more for girls, compared to boys. This could explain why a negative attributional style could be damaging for these girls, and work as a moderator on the relationship between perceived competence in physical appearance and depressive symptoms (Kim-Spoon et al., 2012). Girls with a negative attributional style, who have low levels of perceived competence in physical appearance, might think that there is something wrong with them and their looks, and that what they do, will not improve this. It seems like the pressure to live up to unrealistic ideals about physical appearance, might contribute to depression among girls in early adolescence. This demonstrates how a societal factor like body ideal for females, can be internalized, and together with cognitive factors increase depressive symptoms.

Infant temperament and negative emotionality. Mezulis, Priess, et al. (2011) found that rumination mediated the relationship between infant temperament and depressive symptoms only in girls. Verstraeten et al. (2009) also found that the impact rumination had as a mediator between negative emotionality and depressive symptoms were stronger in girls compared to boys. Even though the same process may contribute to depression in boys, this may be an especially potent contributor to depression among girls. It is interesting that rumination was found to mediate the relationship between infant temperament and depressive symptoms in early adolescence, which underlines the importance of a multifactorial approach to the understanding of how cognitive factors impact increase in depressive symptoms among girls in early adolescence.

Different Conceptualizations of Cognitive Factors

The studies in this literature review have demonstrated that the cognitive factors can work as predictors, mediators, moderators, and as vulnerability factors. The findings indicate

support for both mediation and moderation in impact cognitive factors have on depressive symptoms in early adolescence among girls. This is not necessarily a contradiction, because it is possible that cognitive factors have different roles in the prospective relation with depressive symptoms (Abela & Hankin, 2011). It can be valuable to examine how different mediating and moderating variables fit together in a causal chain and have multiple and reciprocal effects in early adolescence to learn more about the increase in depression in adolescent girls (Hankin & Abramson, 1999; Kazdin, 2014) However, it is important to remember that the use of the different conceptualizations of cognitive factors such as mediators and moderators are tools to understand how these factors impact the increase in depressive symptoms among girls (Kazdin, 2014). Thus, they can also simplify the reality. The future goal is to move beyond these conceptualizations of cognitive factors, and reach an understanding of different mechanisms that lead to depression in different people.

Research also indicates that the relationship between cognitive vulnerabilities, stressors, and depressive symptoms are reciprocal and more complex than the vulnerability-stress model entails (Calvete et al., 2013). It is more descriptive to talk about a "cascade-effect", where after one has experienced depressive symptoms, it is likely to experience more stress and higher levels of negative cognitive factors, which again increases risk of depression.

It is also worth noticing that in many of the articles that found that cognitive factors contributed to the increase in depression especially for girls, the cognitive factors worked together with other factors, such as stress and negative life events, body image, perceived parental support, puberty, and infant temperament. This underlines the importance of keeping multiple factors in mind when examining the increase in depression among girls in early

adolescence. Kraemer (2003) also emphasizes that the future of risk factor research lies in understanding how different risk factors work together.

In order to evaluate the specific and statistically correct impact cognitive factors have on the increase in depressive symptoms among adolescent girls, it would have been necessary to combine the findings in a meta-analytic design. This review has focused on the different roles cognitive factors have on this increase, instead of a statistical evaluation of the importance of the cognitive factors. Nevertheless, it is valuable to examine possible sources of the different and somewhat contradicting findings these articles present. One explanation is that early adolescence is a developmental period where the increase in prevalence of depression has just started, and not fully presented itself, and in the same fashion, that gender differences in prevalence of depression has not yet fully been manifested. This could be an indication of why the results in this age group are ambiguous. It is not until early adolescence that individuals develop cognitive capacities that are used to separate between situational and internal causes, as in attributional style (Hyde et al., 2008). Also, cognitive factors have started to stabilize in early adolescence, but they also fluctuate (Hankin, 2008b). Depression is also a multifactorial disorder, and cognitive factors are one of several types of factors that contribute to depression (Hankin et al., 2009). Many other factors are hypothesized to contribute to the increase in depression that we find in adolescent girls. Therefore, it is possible that each of these factors contribute just a smaller part, and that the sum of all these factors, and the interaction between them, can explain why girls exhibit more depressive symptoms than boys.

It is important to note that although longitudinal designs can tell us whether certain factors precede an outcome, the relationships are still correlational. Even though we get ideas about causes, the longitudinal studies cannot establish causality (Nolen-Hoeksema et al., 2007).

The majority of the studies included in this literature study have found that cognitive factors have a prospective impact on later depressive symptoms in early adolescents**.** Even though the gender differences in depression have not fully emerged in all the articles, this points to the importance of getting to know these cognitive factors and how they work together with other factors to create different pathways to depression (Kraemer, 2003).

Limitations and Strengths

A limitation of this literature review is that the inclusion criteria could have been even more precise. For example, the age span of the participants in the study could have been smaller. Kraemer (2003, p. 426) notes that studying risk factors through longitudinal designs is somewhat like stepping into a fast-moving "stream", where you have to know exactly when to step in and when to step out. If you step in too late, the relevant changes you want to study might already have happened. Likewise, if you step in too soon, the changes might not have occurred yet. Some of the studies in this literature review measured youth from their late childhood through early adolescence. Some changes might have not happened yet when it comes to increase in cognitive vulnerability, and depressive symptoms. This could have contributed to the mixed results of the studies in this review. Also, the literature review could have chosen studies that had more than two measurements. In this way, it could have been easier to capture the different changes that happened along the "stream", and made it possible to reduce sources of error (Kraemer, 2003, p. 426).

Although steps were taken to minimize possible errors in the process of excluding and including articles, it can be a limitation that this process was done by only one person. Accordingly, the exclusion process was not done through consensus between several people, which could reduce the chance of errors in the exclusion and inclusion process.

Depression, adolescence and cognitive factors are all areas which have yielded a lot of research since the year 2000. It was therefore challenging to find the precise keywords in the literature search, in order to find the articles relevant for this particular review. The aim was to be specific enough to exclude non-relevant articles, but also have keywords that would generate the possible relevant articles. The search generated many hits, and there were many articles that had to be excluded. Still, I cannot rule out the possibility that relevant articles can have been missed.

Even though the studies included in this literature review have been conducted in several different countries, they all belong to the western part of the world. Therefore, we do not know if the findings in these articles can be generalized to adolescents in other cultures. Several of the studies in this review had samples with different ethnic groups, and one of the studies found that only among Caucasian adolescents with higher levels of overgeneral autobiographical memory did emotional abuse predict depressive symptoms (Stange et al., 2013). This was not significant among African-American adolescents. Without overemphasizing this finding before it has been replicated, it seems important to also focus on possible differences between ethnic groups and cultures.

There are several strengths in this literature review. The fact that all the articles included in the review had a longitudinal design, made it possible to follow the impact the cognitive factors had on subsequent depressive symptoms. Also, the limited focus on early adolescence was important, because the development in childhood and adolescence is so comprehensive and rapid. However, it seems that this focus could have been limited further. Also, that the review contains studies that used community samples makes it possible to generalize the results about cognitive factors and depressive symptoms to the normal population. It is also a strength that I

included articles that examined how cognitive factors work together with other factors, such as stress, negative life events, infant temperament and parent interaction. This is important because we know that the etiology of depression is multifactorial, and that the future in understanding etiology of depression entails to investigate how factors work together to create depressive symptoms (Hankin et al., 2009). The focus on depression in girls is also a considerable strength of this literature review. This is in terms with the recommendation of Kraemer (2003, p. 427), to avoid "muddling" populations.

Implications

Some articles found that cognitive factors lead to increased depression only in girls, while other articles found that cognitive factors lead to increased depression for both girls and boys. We do not know enough about the mechanisms that lead to depression among girls in early adolescence. Still, the findings in this literature review have implications for development of better interventions; both prevention and treatment of depression among girls in early adolescence.

Prevention. Any intervention that aims to prevent depression from occurring, must address causal risk factors for depression (Kraemer et al., 2001). An important goal of research on cognitive factors` contribution to depression, is to understand the multiple and complex pathways that lead there. This understanding can be used to decide when, and for whom and how to prevent onset of depression (Kraemer et al., 2001). Gillham and Chaplin (2011) emphasize that the transition into adolescence is a critical period for preventing depression in girls. By the time cognitive vulnerabilities start to become stable and trait-like, the time for prevention as an intervention alone may already have passed (Cole et al., 2009). Therefore, it can be a good idea

to aim intervention programs as early as late childhood, and have separate intervention programs for girls, in order to prevent cognitive vulnerabilities from becoming traits in this group.

Treatment. LaGrange et al. (2011) found that maladaptive cognitions persist after depression, and subsequently increase risk for new episodes of depression. This further underlines the importance to address cognitive factors in treatment of depression.

In cognitive-behavioral therapy (CBT), one of the therapeutic goals is to reduce the levels of cognitive factors such as rumination, negative automatic thoughts and maladaptive schemas (Weersing & Brent, 2010). CBT has been found to lead to clinical improvement among depressed adolescents (Brent et al., 1997), although there is still a significant proportion that stay depressed, or experience recurrence of depressive symptoms (Weersing & Brent, 2010). Reduction of levels of these cognitive factors, have been thought to create relief of depressive symptoms. Indeed, it was found in one study that depressed adolescents that received CBT, experienced decreased levels of rumination to the level of adolescents that had never been depressed (Wilkinson & Goodyer, 2008). However, one study found that the improvement found in CBT, could not be accounted for by a reduction in negative cognitions (Brent et al., 1998). It might be that what predicts depression, and maintains depression, is not the same as the factors that account for the effectiveness of the treatment of depression. This might imply that the best way to reduce negative cognitive factors is to prevent them from developing in the first place.

Mindfulness-based treatments have also been suggested as promising alternatives for treating depression in adolescence (Ames et al., 2014). Mindfulness-based cognitive therapy is proposed to reduce depressive symptoms in adolescents partly through awareness of rumination cycles and negative cognitive style. The depressed clients are taught to observe their negative

thought processes such as rumination, and instead of being absorbed by their thoughts; they can learn to disengage from them (Teasdale et al., 2000). Several of the articles in this literature review find that body-image was a part of the increasing rates of depression among girls (Grabe et al., 2007; Kim-Spoon et al., 2012). This could be a theme that might be particularly important to address in therapy with girls.

Evidently, cognitive factors play a crucial part in how these treatments are thought to be efficient. Even though present psychological treatments of depression have received considerable support, there is a pressing need to improve evidence-based treatments for depression among adolescents (Hankin, 2012). It has been found that 40-50% of adolescents receiving treatment for depression do not recover (Fonagy et al., 2002). March (2009) point out that we know too little about which treatments work for which clients, and that there is a need to personalize treatments to a larger extent than what is being done today (Hankin, 2012). In order to personalize interventions, it is necessary to gain an understanding of how depression might be different in subgroups of depressed adolescents, and how this might affect what treatment they need. Maybe it is better to focus on the developmental pathway to depressive symptoms when choosing interventions, rather than just focusing on the presenting symptoms. Therefore, the knowledge of cognitive factors`s role in the different pathways to depression should inform and hopefully advance interventions (Hankin, 2012).

Recommendations for future research. The importance of a limited age span when it comes to studying how cognitive factors contribute to depressive symptoms in adolescent girls, should be taken into consideration in future research. Even though longitudinal studies are time-consuming and expensive to conduct, to initiate more longitudinal studies will be beneficial. These longitudinal studies should include several measurements, and shorter time span between

the measurements, which can hopefully reduce possible errors in collecting data about this group. Further, Hankin (2008a) notes that caution is needed not to overgeneralize results about gender and age to other age groups. Research on depression demonstrated that development stage is very important when it comes to risk factors for depression, especially when it comes to childhood and adolescence. This literature review shows the possible variations in only one developmental period, mainly early adolescence.

Further, the studies included in this literature review use a myriad of different instruments to measure cognitive factors and depressive symptoms. Most of the articles selected in this literature review have used self-report measures of depression. The exceptions are Nolen-Hoeksema et al. (2007), Stange et al. (2013), and Abela and Hankin (2011) which used K-SADS, a diagnostic interview. It has been noted that studies using K-SADS find larger gender differences in depressive symptoms than studies using CDI, a self-report questionnaire, which could have implications for how results are interpreted (Abela & Hankin, 2011). It would therefore be useful to agree on certain instruments in the future, in order to rule out that the instruments could be a source of bias.

Concluding Remarks

The articles included in this literature review demonstrate that cognitive factors contribute to the onset of depressive symptoms in different ways. Cognitive factors worked together with other factors, such as stress and negative life events, body image, perceived parental support, puberty, and infant temperament to increase depressive symptoms in girls in early adolescence. This demonstrates how important it is to study the multiple pathways that can lead to depression. Unfortunately, it is difficult to draw any conclusions about how cognitive factors contribute to the increase in depressive symptoms among girls in early adolescence

because the articles had different results. However, we know that cognitive factors are important, and work together with several other factors, and that there are several pathways to depression in adolescent girls. The hope for the future is that advances in research on different risk factors, together with more well-designed longitudinal studies, will lead to progress in the field (Insel, 2009; Kraemer, 2003). In order to find better prevention and treatment programs in the future, it is crucial to continue with the disciplined and careful research on etiology of depression.

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Appendix A. Criteria for Depression in DSM-5

Table A1.

DSM-5 Diagnostic Criteria for Major Depressive Disorder

A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either 1) depressed mood or 2) loss of interest or pleasure.
Note: Do not include symptoms that are clearly attributable to another medical condition.

1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, hopeless) or observation made by others (e.g., appears tearful). (Note: In children and adolescents, can be irritable mood.)
2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation).
3. Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase inn appetite nearly every day. (Note: In children, consider failure to make expected weight gain).
4. Insomnia or hypersomnia nearly every day.
5. Psychomotor agitation or retardation nearly every day.
6. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick).
7. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as by observed by others).
8. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or specific plan for committing suicide.

B. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
C. The episode is not attributable to the physiological effects of a substance or to another medical condition.
Note: Criteria A-C represent a major depressive episode.
Note: Responses to a significant loss (e.g., bereavement, financial ruin, losses from a natural disaster, a serious medical illness or disability) may include the feelings of intense sadness, rumination about the loss, insomnia, poor appetite, and weight loss as noted in Criterion A, which may resemble a depressive episode. Although such symptoms may be understandable or considered appropriate to the loss, the presence of a major depressive episode in addition to the normal response to a significant loss should also be carefully considered. This decision inevitably requires the exercise of clinical judgment based on the individual`s history and the cultural norms of expression of distress in the context of loss.
D. The occurrence of the major depressive episode is not better explained by schizoaffective disorder, schizophrenia, schizophreniform disorder, delusional disorder, or other specified and unspecified schizophrenia spectrum and other psychotic disorders.
E. There has never been a manic episode or a hypomanic episode.
Note: This exclusion does not apply if all of the manic like or hypomanic-like episodes are substance-induces or are attributable to the physiological effects of another medical condition.

Note. A major episode can further be specified as mild, moderate or severe, with or without psychotic features, in partial or full remission or as a single or recurrent episode. From American Psychiatric Association (2013, p. 160).

Appendix B. Overview of Exclusion Categories

Table B1.

Number of articles excluded based on titles, abstracts, and full text, by exclusion categories.

Categories of exclusion:	Titles:	Abstracts:	Full text:
Dissertation:	11		
Not depression:	170		
Not cognitive factors:	73	5	3
Wrong age:	111	15	12
Not community sample:	11	8	6
Not longitudial study:	6	3	
Self-esteem:	3		
Depression not outcome:	7	9	3
Review/ meta-analysis:			
Not seperation of genders:			6
Total:	403	43	30