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Cognitive Schemata in Depressed Adolescent Girls and Their Mothers

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Abstract. Schemata (and other cognitions) were investigated in depressed adolescent girls and their mothers and were compared to those in a control group. Links between adolescent and maternal cognitions were also examined. There were 14 girls and mothers in the clinical group and 15 in the control group. The depressed adolescents had higher total scores on a measure of schemata than the control adolescents, and higher scores on several of its sub-scales. They also scored more highly on two other measures of cognition (dysfunctional attitudes and negative automatic thoughts). The mothers of the depressed adolescents were more depressed than mothers of control adolescents. However, the two groups of mothers did not differ on the measures of cognition, including schemata. Depression and schemata in adolescents were related to these variables in their mothers but only in the depressed group. Possible explanations for the findings, including the nature of the link between mood and cognition in the groups studied, are considered. Implications for cognitive theory and therapy in depressed adolescents are briefly discussed.

Keywords: Cognition, schema, dysfunctional attitudes, depression, adolescents, mothers.

Introduction

It has been argued that depression in adolescents has "become a major public health issue" (Moor et al., 2000, p. 331). Prevalence over 12 months in community surveys, using diagnostic interviews and DSM criteria, is approximately 4–5% (e.g. Lewinsohn, Rhode and Seeley, 1998; Haarasilta, Marttunen, Kaprio and Aro, 2001). The risk of recurrence before age 18 is high (Lewinsohn, Clarke, Seeley and Rohde, 1994), adjustment problems in early adulthood are

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subsequently common (Giaconia, Reinherz, Paradis, Hauf and Stashwick, 2001), and the disorder often persists, with adolescent depression predicting depression in adulthood (e.g. Harrington, Fudge, Pickles and Hill, 1990).

As well as being a source of distress and a problem in itself, depression in adolescence can affect all areas of development, particularly social and educational, which may then confer further disadvantage on the depressed adolescent. Although the gender balance is equal in childhood, depression also becomes more common in girls than boys by adolescence, and thus it is a particular problem for girls (e.g. McGee, Feehan, Williams and Anderson, 1992).

Recently, there has been increased interest in cognitions in depressed children and adolescents. Although developmental considerations need to be taken into account, there is evidence that depressed adolescents, like adults, engage in depressive thinking (Garber, Weiss and Shanley, 1993). This includes a small number of studies on clinical populations (e.g. Kazdin, 1990; Farmer et al., 2001). There is also some preliminary evidence that cognitive therapy may be helpful in treating depressed children and adolescents (e.g. Kahn, Kehle, Jensen and Clarke, 1990; Reinecke, Ryan and Dubois, 1998), including those who are clinically depressed (e.g. Wood, Harrington and Moore, 1996; Harrington, Whittaker, Shoebridge and Campbell, 1998; Asarnow, Scott and Mintz, 2002).

However, as yet there is little empirical research on the different types or levels of cognition that may characterize clinical depression in adolescents. Beckian cognitive theory typically identifies several levels and/or types of cognition (Clark and Beck, 1999). These include three for which self-report questionnaires have been developed – schema, dysfunctional attitudes and negative automatic thoughts. All three characterize depression in adults (Beck, Rush, Shaw and Emery, 1979). Schema develop early in life and reflect global, negative views; dysfunctional attitudes also develop relatively early and reflect cross situational rules, beliefs or attitudes. Negative automatic thoughts reflect moment by moment self talk. Some preliminary work has been conducted suggesting that the second two levels characterize clinical depression in childhood and adolescence (e.g. Kazdin, 1990; Martin, Kazarian and Breiter, 1995; Farmer et al., 2001) but we were unable to find any research on schemata in this group. Thus it is not known, for example, whether cognitive disturbance at the level of schemata is typical of clinical depression in adolescents, in the same way that it appears to be a feature of clinical depression in adults.

There has also been work on the intergenerational transmission of cognitions in depression. To date, most of this work has been conducted on either depressed mothers and/or "at risk" children, and not on adolescents or children who are themselves clinically depressed. Thus there is, for example, some evidence for differences in cognition in the mothers of "at risk" and control children (e.g. Alloy et al., 2001). There is also some evidence for links between negative cognition in non-clinical groups of parents and children (e.g. Garber and Robinson, 1997; Stark, Schmidt and Joiner, 1996). To date, however, none of these studies has studied a group of clinically depressed adolescents.

Ideally, a longitudinal design is required in order to draw conclusions about vulnerability or causal relationships between adolescent and parent mood and cognition. However, such a design is costly and expensive, particularly when clinical disorder is to be studied. Given that so little work has been conducted with clinically depressed adolescents in this field, a cross sectional design, to investigate preliminary hypotheses that might later be examined longitudinally, seemed a good first step. The current study therefore had three hypotheses. These were that: (1) clinically depressed adolescents would score more highly than non

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depressed adolescents on a measure of schemata (and other cognitions); (2) mothers of the depressed adolescents would score more highly than mothers of non depressed adolescents on a measure of schemata (and other cognitions); (3) adolescent and maternal cognitions would be related.

Method

Design

A case control design was used.

Participants

Females aged 13–17 years with depression meeting DSM-IV criteria (American Psychiatric Association, 1994) were recruited through adolescent mental health services. They were invited to take part in the study by their primary therapist and, if agreeable, were referred to the research team to obtain further information about the study, and then to decide whether or not they would like to take part. None declined at this stage. Potential participants were excluded if their primary problem was not depression, or if they were experiencing psychotic symptoms (in practice none of those referred had to be excluded for these reasons). Their mothers were also recruited, regardless of their own mental health status.

Control participants were female, aged 13–17 years and were recruited through local schools. Participants were excluded if they had a history of depression, or had received treatment for mental health problems. Their mothers were also recruited, regardless of their own mental health status.

Measures

Demographic data were collected on age, occupation (to obtain social class), living arrangements for the child, mental health status and treatment.

Self-report questionnaires – adolescents

Schema Questionnaire, short form (Young, 1998). This measures 15 "early maladaptive schemas" (Young, 1990). These form the deepest level of cognition, and serve as templates for the processing of experience. They are thought to develop during childhood, and may be activated by experiences that are similar to those that led to their initial development. Six domains have been identified: instability/disconnection, impaired autonomy, undesirability, restricted self-expression, restricted gratification, and impaired limits. Some initial data suggest that the reliability and validity of the short form is good (Waller, Meyer and Ohanian, 2001; Stopa, Thorne, Waters and Preston, 2001). A few minor amendments were made, with Young's permission, to make the wording acceptable to adolescents and to the UK population.[1] To our knowledge the measure has not previously been used with adolescents.

[1]The revised copy is available from the authors.

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Dysfunctional Attitude Scale-24 (Weissman and Beck, 1978; Power et al., 1994). This measures the maladaptive attitudes that provide a link between schema and automatic thoughts. There are three sub-scales – Achievement, Dependency and Self-control. Studies suggest that the measure has good reliability and validity (Power et al., 1994). A longer version has also been shown to have good psychometric properties with adolescents (Martin et al., 1995), and the long and short versions are highly related (Power et al., 1994).

Automatic Thoughts Questionnaire (Hollon and Kendall, 1980; Kazdin, 1990). This measures negative thoughts at the "automatic thought" level. Versions for adults (Hollon and Kendall, 1980) and for children (Kazdin, 1990) are available. Both versions have good psychometric properties. The adolescents completed the child version (Kazdin, 1990).

Mood and Feelings Questionnaire (Costello and Angold, 1988; Kent, Vostanis and Feehan, 1997). This assesses depressive symptoms in children aged 8 to 18 years, and has good psychometric properties (Kent et al., 1997).

Self-report questionnaires – parents

The parents completed the same versions of the Schema Questionnaire and Dysfunctional Attitude Scale. In addition, they completed the adult version of the Automatic Thoughts Questionnaire (Hollon and Kendall, 1980). They also completed an additional measure:

Beck Depression Inventory (Beck, Ward, Mendelson, Mock and Erbaugh, 1961). This is a 21-item measure of depressive symptoms, with good reliability and validity (Beck et al., 1961).

Semi-structured interview

Each adolescent also participated in a semi-structured interview based on that used by Turner and Cooper (2002), and designed to elicit information on core beliefs. Data on number of beliefs and mean rational and emotional belief (the latter two measures rated on scales from 0-100 for degree of belief) were collected. This information was used to provide convergent validity for the adolescents' YSQ scores. Some preliminary psychometric data have been reported for this measure in young adults (Turner and Cooper, 2002).

Procedure

Participants were visited at home. Demographic information not already known was obtained. Daughters completed the semi-structured interview. Mothers and daughters then completed the self-report questionnaires separately. They were also asked if they would be willing to complete the Schema Questionnaire at a later date to provide data on test-retest reliability.

All adolescent participants were screened for depression at the time of the study by a researcher using the depression module of the Structured Clinical Interview for DSM-IV (Spitzer, Williams and Gibbons, 1996). All adolescents in the depressed group met DSM-IV criteria for major depression at the time of taking part. The SCID (designed for adults) was used because of the limited data base pertaining to psychometric base of child diagnostic measures when used with adolescents (e.g. Hamilton and Gilham, 1999).

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Table 1 Scores on measures of depression for the adolescents and mothers in the two groups

	Depressed adolescents		Control adolescents		
	Mean	*SD*	Mean	*SD*	Significance level
Moods and Feelings Questionnaire	38.1	7.6	11.3	4.9	< .001
	Mothers of depressed adolescents		Mothers of control adolescents		
	Mean	*SD*	Mean	*SD*	
Beck Depression Inventory	9.8	6.1	5.4	6.6	< .04

Results

Demographic characteristics

All the girls who participated were aged 13 to 17. There were 14 participants in the clinical group and 15 in the control group. All were Caucasian, including the mothers. The mean age of the clinical group was 15.9 years ($SD = 1.12$), and of the control group, 15.6 years ($SD = .96$). There was no significant difference between the two groups in mean age ($t = .18$, NS). Social class was assessed using the Registrar General's method (Office of Population Censuses and Surveys, 1990). Inspection of the data suggested that the distribution of social class in the two groups was similar.

Depressive symptoms

Mean scores for the two groups of girls and mothers on measures of depressive symptoms are shown in Table 1. The depressed adolescents had significantly more symptoms of depression than the controls ($U = 0$, $p < .0001$). The mothers of depressed adolescents also had significantly more symptoms of depression than the mothers of controls ($U = 57.5$, $p < .04$).

Current treatment

All the depressed adolescents had begun treatment for depression (current duration of treatment at time of study was 2 weeks to 3 months). Two were receiving cognitive behaviour therapy, the remainder were receiving medication. All met DSM-IV criteria for major depression at the time they took part in the current study.

Psychometric properties of the Young Schema Questionnaire

Internal consistency. Cronbach alpha coefficients were computed for each YSQ factor, separately for adolescents and mothers. Values in adolescents ranged from 0.78

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to 0.98. Values in mothers ranged from 0.75 to 0.94. These suggest good internal consistency.

Test-retest reliability. Twenty-five per cent of the participants were retested 2 weeks later. Using Wilcoxon matched pairs sign rank tests, none of the 75 items, in either adolescents or adults, were significantly different at the 1% level. These results suggest good test retest reliability.

Convergent validity. Total YSQ scores were correlated with number and rational and emotional belief in negative core beliefs elicited using the semi-structured interview. These correlations were: number of core beliefs .60, mean rational belief .56, mean emotional belief .63 (all correlations $p < .01$).

Cognitive differences between adolescent groups

Young Schema Questionnaire. The YSQ was scored in each of the three ways recommended – total numerical score, percentage of clinically significant schema, clinical significance of schema. Scores for the two adolescent groups using all the three scoring systems can be seen in Table 2. Total numerical score was higher in the depressed ($M = 236.9$, $SD = 41.4$) group than in the control group ($M = 139.1$, $SD = 32.4$) ($U = 5.5$, $p < .001$) as was total percentage of clinically significant schema score (depressed group $M = 225.2$, $SD = 52.6$, control group $M = 141.5$, $SD = 36.7$, $U = 0$, $p < .0001$). Total number of clinically significant schema was also higher in this group ($U = 2$, $p < .001$).

Each of the 15 schemata was also considered separately. Using the numerical score, the depressed adolescents scored more highly on all but four of the subscales. The exceptions were enmeshment, self-sacrifice, unrelenting standards and entitlement. On percentage of clinically significant schema, the depressed adolescents scored more highly on seven sub-scales. These were abandonment, mistrust/abuse, social isolation, defectiveness/shame, subjugation, emotional inhibition, and insufficient self control.

On number of clinically significant schema, the depressed adolescents scored more highly on five subscales. These were abandonment, mistrust/abuse, social isolation, defectiveness/shame, and insufficient self-control.

Dysfunctional Attitude Scale

Mean DAS scores for the two groups of adolescents can be seen in Table 3. The depressed group scored significantly more highly on the DAS total score ($U = 32$, $p < .001$), and on two of the three sub-scales (Achievement, $U = 37.5$, $p < .002$, and $p < .02$; Self control, $U = 45.5$, $p < .008$ but not Dependency).

Automatic Thoughts Questionnaire

Mean ATQ scores for the two groups of adolescents can be seen in Table 3. Scores for the depressed group were significantly higher than the control group on the ATQ ($U = 1$, $p < .0001$).

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Table 2 Scores on the Young Schema Questionnaire for the two groups of adolescents – all three scoring systems

	Numerical scores			Percentage scores			Number of clinically significant schema		
	D *M* (*SD*)	C *M* (*SD*)	*U*	D *M* (*SD*)	C *M* (*SD*)	*U*	D *M* (*SD*)	C *M* (*SD*)	*U*
Emotional deprivation	12.1 (5.0)	6.5 (2.9)	27.5*	10.0 (18.1)	1.3 (5.2)	61.5	0.08 (0.29)	0.00 (0.00)	82.5
Abandonment	20.2 (8.2)	8.0 (4.1)	21.5*	51.7 (41.3)	2.7 (10.3)	32.5*	0.67 (0.49)	0.07 (0.26)	36.0*
Mistrust/abuse	17.9 (6.0)	9.1 (3.4)	13.5*	36.7 (33.9)	0.00 (0.00)	30.0*	0.58 (0.51)	0.00 (0.00)	37.5*
Social isolation	17.2 (7.7)	6.9 (2.1)	21.0*	38.3 (39.5)	0.00 (0.00)	37.5*	0.58 (0.51)	0.00 (0.00)	37.5*
Defectiveness/shame	20.3 (6.4)	6.7 (1.8)	5.0*	48.3 (48.1)	0.00 (0.00)	15.0*	0.67 (0.49)	0.00 (0.00)	30.0*
Failure	17.4 (9.3)	8.4 (3.2)	42.0	43.3 (48.1)	0.00 (0.00)	45.0	0.50 (0.52)	0.00 (0.00)	45.0
Dependence/incompetence	14.7 (5.7)	8.5 (3.8)	32.5	13.3 (19.7)	0.00 (0.00)	52.5	0.17 (0.40)	0.00 (0.00)	75.0
Vulnerability to harm	13.6 (6.1)	7.5 (2.1)	24.5*	25.0 (36.3)	0.00 (0.00)	52.5	0.33 (0.49)	0.00 (0.00)	60.0
Enmeshment	11.7 (6.3)	8.3 (2.3)	60.0	15.0 (30.9)	1.3 (5.2)	72.5	0.17 (0.39)	0.00 (0.00)	75.0
Subjugation	14.7 (4.5)	8.5 (3.0)	23.0*	20.0 (22.6)	1.33 (5.2)	48.5*	0.42 (0.51)	0.00 (0.00)	52.5
Self-sacrifice	17.5 (6.6)	13.9 (5.6)	59.5	36.7 (34.9)	14.7 (25.6)	51.0	0.50 (0.52)	0.20 (0.41)	63.0
Emotional inhibition	15.6 (3.6)	7.7 (3.2)	14.0*	20.0 (22.6)	0.00 (0.00)	37.5*	0.25 (0.45)	0.00 (0.00)	67.5
Unrelenting standards	20.4 (7.5)	15.3 (6.1)	52.0	48.3 (40.4)	25.3 (33.3)	58.5	0.58 (0.51)	0.40 (0.51)	73.5
Entitlement	12.2 (4.8)	10.5 (4.4)	70.5	16.7 (22.3)	9.3 (18.3)	74.5	0.33 (0.49)	0.13 (0.35)	72.0
Insufficient self-control	21.7 (5.8)	13.2 (5.1)	24.5*	51.7 (35.6)	12.0 (24.8)	32.5*	0.67 (0.49)	0.13 (0.35)	42.0*

D = Depressed adolescents. C = Control adolescents. *U* = Mann Whitney U. *M* = Mean. *SD* = Standard deviation. $^{*}p < .05$.

Table 3 Scores on the Dysfunctional Attitude Scale and Automatic Thought Questionnaire for adolescents and mothers

	Depressed adolescents		Control adolescents	
	Mean	*SD*	Mean	*SD*
ATQ*	92.0	26.3	44.3	8.2
DAS – achievement*	34.9	13.4	25.5	9.9
DAS – dependency	30.4	7.8	29.3	12.0
DAS – self-control*	36.6	5.3	30.8	9.6
DAS total*	101.9	21.7	85.7	23.9
	Mothers of depressed adolescents		Mothers of control adolescents	
	Mean	*SD*	Mean	*SD*
ATQ	42.5	9.9	41.8	15.9
DAS – achievement	22.8	6.7	21.3	8.6
DAS – dependency	31.7	2.1	24.8	7.6
DAS – self-control	27.0	4.6	31.2	7.9
DAS total	81.5	8.0	77.2	21.7

ATQ = Automatic Thoughts Questionnaire; DAS = Dysfunctional Attitude Scale; $^{*}p < .01$ for differences between groups.

Cognitive differences between the two groups of mothers

Young Schema Questionnaire. There were no significant differences between the two groups of mothers for any of the total scores on the YSQ (numerical score, $U = 70$, NS; percentage of clinically significant schema, $U = 82$, NS; number of clinically significant schema, $U = 18$, NS). When each of the 15 schema was considered separately, the mothers of depressed adolescents had a significantly greater number of social isolation schema ($U = 47$, $p = .01$). This difference remained significant when level of depression was controlled ($p = .02$).

Dysfunctional Attitude Scale. There were no differences between the two groups of mothers on total DAS ($U = 92.5$, NS) or DAS sub-scale scores (Achievement, $U = 88$, NS; Dependency, $U = 97.5$, NS; Self control, $U = 92.5$, NS).

Automatic Thoughts Questionnaire. There were no differences between the two groups of mothers on ATQ scores ($U = 65$, NS).

Cognitive similarities between mothers and daughters

These were examined for the two groups of mothers and daughters separately.

Young Schema Questionnaire. There was a significant correlation between depressed adolescents and mothers total scores on the YSQ ($r = .89$, $p < .02$), but not between the scores of the control adolescents and mothers ($r = .66$, NS). There was also a significant correlation, for the depressed group, on the defectiveness/shame sub-scale ($r = .63$, $p < .02$).

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Table 4 Summary details for hierarchical multiple regression analysis

Significant predictor	Adj R square	Beta	*df*	T	Significance level
ATQ total		.09		7.8	.0001
Vulnerability to harm	.90	.63	3,28	2.7	.01

ATQ = Automatic Thoughts Questionnaire.
Adj R Square = Adjusted R Square.

When depression was controlled, the first correlation was no longer significant, but that for defectiveness/shame remained significant ($r = .54$, $p = .05$).

Dysfunctional Attitude Scale. There were no significant correlations between depressed adolescents and their mothers, or between control adolescents and their mothers, scores on the DAS total (Depressed group, $r = .36$; Control group, $r = -.14$), or on any of the three subscales (Achievement depressed group, $r = 40$, control group, $r = -.03$; Dependency depressed group, $r = .19$, control group, $r = .20$; Self control depressed group, $r = -.02$, control group, $r = -.18$).[2]

Automatic Thoughts Questionnaire. There was no significant correlation between depressed adolescents and their mothers' scores on the ATQ ($r = .26$). There was a significant correlation ($r = .75$, $p < .001$) between control adolescents and their mothers scores on the ATQ.

Cognitive predictors of depression

A hierarchical regression was conducted in order to see whether the YSQ numerical scores added additional variance to the prediction of depression when ATQ and DAS total scores were controlled. The unstandardized residuals of the dependent variable were assessed for normality – these met the assumptions necessary for a regression analysis.

One sub-scale of the YSQ emerged as a significant predictor – vulnerability to harm. No other YSQ variables were significant predictors. When vulnerability to harm entered the analysis adjusted R square was .88. Despite the small sample size, the ratio of predictors to cases closely approaches acceptability (Tabachnick and Fidell, 2001). Summary details for the analysis are presented in Table 4.

Discussion

The results of the current study indicated that the YSQ has good internal consistency, good test retest reliability and good convergent validity in a sample of depressed and control adolescents and their mothers. Depressed adolescents scored more highly than control adolescents on total YSQ scores, including numerical score, percentage of clinical significant schema, and total number of clinically significant schema. They also scored more highly on the numerical score

[2]YSQ and DAS measures may be seen to be related measures of tacit beliefs but while relationships between the two were significant in the adolescent and maternal control groups, and in the mothers of depressed adolescents, the relationship was not significant in the depressed adolescents.

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for the majority of the sub-scales. Differences were also found on several individual sub-scales for percentage and number of clinically significant schema. The depressed adolescents also scored more highly on both the DAS (including all three sub-scales and total score) and ATQ than the control adolescents.

There were no significant differences between the two groups of mothers on YSQ, DAS or ATQ scores, although there was a difference in depressive symptoms. There was a significant correlation between depressed adolescents and their mothers' scores on the YSQ total score, and on the defectiveness/shame sub-scale. While the first relationship disappeared when depression was controlled, the second did not. There was also a significant correlation between control adolescents and their mothers' on ATQ scores.

One sub-scale of the YSQ (vulnerability to harm) added to the prediction of depression in the adolescents when scores on the DAS and ATQ were controlled. The study indicates that depression in adolescents is associated with negative cognitions, including negative schema, as well as dysfunctional attitudes and negative automatic thoughts. This finding mirrors results from the adult field (e.g. Shah and Waller, 2000, for schema), and confirms previous findings in depressed adolescents for negative thoughts and dysfunctional attitudes (e.g. Kazdin, 1990; Farmer et al., 2001). It also extends existing research with adolescents to include schema.

The mothers of depressed adolescents were more depressed than control mothers. This finding is consistent with research into the familial mature of depression (Garber and Robinson, 1997). Mothers of depressed adolescents also had a higher total YSQ score and greater number of social isolation schema than the control mothers. However, while difference in total YSQ scores was related to mothers' level of depression, difference in social isolation schema was not.

Despite difference in depressive symptoms the two groups of mothers did not differ on DAS or ATQ scores. This might be thought surprising, given that negative schema are hypothesized to result in higher levels of such cognitions. One possibility is that depression in these mothers is the result of having a depressed daughter, and the stresses that brings, perhaps mediated directly by a sense of being different and isolated from other families with daughters of a similar age who are not depressed, or receiving psychiatric treatment. Another possibility is that the DAS and ATQ, unlike the YSQ, are not particularly sensitive measures of cognitive differences in a non-clinical population.

While differences in mothers on total YSQ score seemed to be related to depression, differences in social isolation schema were not related to depression. This suggests that in the current sample mood is not a sufficient explanation for differences in this schema.

Depressed adolescents and their mothers' scores on the YSQ, including on the defectiveness/shame sub-scale, were highly correlated. This suggests that depressed adolescents and their mothers are similar in their schema. The correlation became non-significant for total YSQ scores when depression was controlled, but remained significant for defectiveness/shame. Thus the relationship between mothers and daughters on this schema seems unrelated to level of depression.

Similarity between depressed daughters and their mothers in mood and negative schema raises the possibility that depressed mood and its associated cognitions in mothers may have an influence on the development of depression in their daughters. However, as suggested above, it is also possible that depression in daughters influenced the development of low mood in mothers. Indeed, informal feedback from the semi-structured interviews with mothers suggested that this may have been the case. Another possibility is that mother and

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daughter have been affected by a third, shared life event or depression in another family member.

Lack of a relationship between cognition in control mothers and daughters is consistent with previous research (Goodman, Adamson, Riniti and Cole, 1994; Garber and Robinson, 1997). One explanation for this may be methodological – lack of variance in scores in the two groups. Alternatively it may be that some degree of depression is necessary for a correlation to be present. This suggestion is supported by the finding that controlling for depression reduced the correlation between YSQ scores in the depressed group and their mothers to a non-significant level. One possibility is that schema may, in fact, be mood dependent (e.g. Stopa et al., 2001), and that cognitions become inaccessible once someone is no longer depressed. However, the relationship remained for one individual schema when depression was controlled, in the depressed group, suggesting that links between schema in the two groups may on occasion be independent of mood. In a similar vein, it may be that both DAS and ATQ scores are mood dependent – and failure too find differences between the two groups of mothers is also due to their relatively low levels of depressive symptoms. Indeed, the stability of cognition in adolescents is not yet much researched. Our preliminary findings suggest that the YSQ has good stability over time, but it is not clear whether the DAS and ATQ have stability, or whether they are also mood dependent in adolescents.

The current study was small in size, and caution must be exercised in generalizing from its results (particularly when considered the regression analysis). A large number of comparisons were also conducted given the sample size, and although methods for statistical correction were considered, it is not clear that these are advisable in small scale exploratory studies (Cohen, 1992). Nevertheless, the study has generated useful new information relevant to depression and cognition in adolescents, that deserves to be further investigated in future, and larger, studies.

Theoretically, the results suggest that cognitive theory, including the construct of schema, is generalizable to adolescents. Clinically, the measures employed here, including the YSQ, may be useful assessment measures in treatment, and also in research studies conducted with adolescents who are depressed. Cognitions, including schema, may also be a useful focus for intervention in this group.

The results highlight the systemic nature of adolescent depression and suggest that maternal depression and cognitions may need to be considered when treating a depressed adolescent.

More research is needed into the direction of causality of adolescent and maternal schema and other cognitions in clinically depressed adolescents and their mothers. Longitudinal studies, tracking adolescent and maternal changes in schema, for example in those at high risk of developing depression, and as adolescents recover, although difficult and costly to organize, might be particularly useful here. Further research into the relationship between schema and mood, including psychiatric disorders in adolescents, is also needed.

One important issue for further research, which is suggested by the variability in some of our results, and which is also an important issue in the adult field, is how best to assess cognitions, particularly deeper level beliefs, in adolescents. Early research studies on cognition in children made use of detailed semi- or unstructured assessment methods (e.g. Kendall and Hollon, 1981). Although interest in this methodology has waned, it may be a particularly useful way to identify important and idiosyncratic beliefs and their relationships to depression and other types of cognition in an area where there are, to date, few measures designed specifically for this group. Our developing work with semi-structured interviews (Turner and Cooper,

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2002) also seems a promising avenue for further research in this area, and avoids some of the problems of pre-specifying the beliefs and relationships expected.

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