



Preliminary communication

Affective bias and current, past and future adolescent depression: A familial high risk study



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ABSTRACT

Background: Affective bias is a common feature of depressive disorder. However, a lack of longitudinal studies means that the temporal relationship between affective bias and depression is not well understood. One group where studies of affective bias may be particularly warranted is the adolescent offspring of depressed parents, given observations of high rates of depression and a severe and impairing course of disorder in this group.

Methods: A two wave panel design was used in which adolescent offspring of parents with recurrent depression completed a behavioural task assessing affective bias (The Affective Go/No Go Task) and a psychiatric interview. The affective processing of adolescents with current, prior and future depressive disorder was compared to that of adolescents free from disorder.

Results: Adolescents with current depression and those who developed depression at follow-up made more commission errors for sad than happy targets compared to adolescents free from disorder. There was no effect of prior depression on later affective processing.

Limitations: Small cell sizes meant we were unable to separately compare those with new onset and recurrent depressive disorder.

Conclusions: Valence-specific errors in behavioural inhibition index future vulnerability to depression in adolescents already at increased risk and may represent a measure of affective control. Currently depressed adolescents show a similar pattern of affective bias or deficits in affective control.

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1. Introduction

Adolescence is associated with a marked increase in the prevalence of depressive symptoms and disorder (Kim-Cohen et al., 2003; Lewinsohn et al., 1998; Thapar et al., 2012). Depression in young people is not benign and is associated with a range of poor outcomes including deliberate self-harm, academic failure and poor mental health in adulthood. Cognitive theories of depression propose that affective bias and negative styles of thinking play a crucial role in the development and maintenance of depression (Beck, 2008; Roiser et al., 2012). More recent models emphasise the role of 'low level' affective information processing biases in the development of 'higher level' negative schemata and depression (Roiser et al., 2012). Whilst it is clear that depressive symptoms and affective biases co-occur, the precise role of affective biases in

the onset of depression and the role of prior depression on later affective processing is unclear (Jacobs et al., 2008; Roiser et al., 2012). Longitudinal studies are required in order to determine whether affective biases are state markers associated with current depression, or 'trait' markers of risk that precede depression onset or persist after remission.

One group where the investigation of affective processing and depression is particularly warranted is the offspring of depressed parents. Parental depression is a robust risk factor for depression in adolescence, with approximately 40% of the offspring of depressed parents developing depressive disorder themselves by early adulthood (Rice et al., 2002). Although there is heterogeneity in outcome for the children of depressed parents, when depression does develop, evidence suggests a severe and impairing course (Lieb et al., 2002). The potential importance of affective processing in explaining outcome in this high-risk group is illustrated by the efficacy of a preventive form of Cognitive Behavioural Therapy (CBT) that seeks to challenge negative thinking in selected high-risk groups (Garber et al., 2009), and

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reports of more negative explanatory styles (schemata) in high-risk compared to low-risk offspring when self-report measures are used (Garber and Robinson, 1997). However, existing studies of affective bias in adolescent depression are often cross-sectional making it difficult to draw conclusions about the direction of influence over time. Moreover, very few studies to date have used behavioural measures of affective processing which are thought to provide a more objective assessment of affective bias than self-report questionnaires, which rely on introspection and awareness of affective bias.

The Affective Go/No Go task (AGN; Murphy et al., 1999) is an inhibitory control paradigm that has been used to investigate affective biases in depressed adults and adolescents. The task requires participants to make a motor response ('go') to words of a target valence (happy or sad), while simultaneously inhibiting motor responses ('no-go') to words of the competing valence. It also involves affective set-shifting of attention and responses, as the target category changes across experimental blocks. Depressed adults have been shown to respond faster to sad targets than happy targets, and miss more happy than sad targets (Erickson et al., 2005; Murphy et al., 1999), suggesting the presence of affective biases in currently depressed adults.

Two cross-sectional studies have examined affective processing in adolescent depressive disorder using the AGN. Although these studies have found evidence of affective bias, they do not precisely mirror those reported in adult studies. Kyte et al. (2005) compared the performance of healthy controls to that of adolescents with a first onset of depression in the past year. Recently depressed adolescents made more commission errors during blocks with happy targets, suggesting they were less able to inhibit responses to sad distractors. Maalouf et al. (2012) included current and remitted depression groups as well as healthy adolescent controls. They found evidence of state-dependent affective biases; currently depressed adolescents responded more quickly when shifting to sad targets than when shifting to happy targets compared to remitted and control adolescents. To date, there is no longitudinal study of affective bias measured with the AGN and adolescent depression, and no such study in adolescents at high familial risk of developing depression.

In this study we examined affective bias in a 1-year longitudinal study of adolescents at risk of depression due to parental history of depression. The aim was to assess relationships between adolescent depressive disorder and affective bias by making use of a two-wave panel design where psychopathology and affective bias had been assessed on two occasions using well-validated methods. We examined the following questions: What is the cross-sectional and longitudinal relationship between measures of affective bias and depression in a high-risk sample? Specifically, we examined 1) the association of affective bias with current depression and 2) the relationship between earlier depression and later affective bias, in order to assess whether experience of depression alters affective processing. Finally, we examined 3) whether individuals with depression at follow-up (new onset or recurrence) differed in their affective processing at baseline from those who did not.

2. Method

2.1. Participants

Participants came from a three-wave longitudinal study of the offspring of parents with recurrent unipolar depression: the Early Prediction of Adolescent Depression (EPAD) study (Mars et al., 2012). Parents were recruited predominantly from primary care (general practice surgeries) in South Wales, UK on the basis of treatment for at least two episodes of DSM-IV major depressive disorder (confirmed at interview). The mother was the affected parent in 93% of the

eligible sample at baseline and 99% reported their ethnicity as British (Mars et al., 2012). This paper reports on data collected at the second (hereafter referred to as baseline) and third assessments (carried out on average 12.5 months later; hereafter referred to as follow-up) of this cohort, when adolescents completed a test battery including the AGN. Assessments were conducted in families' homes. Parents and adolescents aged 16 years and over provided written informed consent, younger participants provided written assent. Ethical review and approval were provided by the Multi-Centre Research Ethics Committee for Wales.

We included participants with no disorder or with depressive disorder (see Section 2.2). Fig. 1 describes participation rates, reasons for non-completion of assessments and the groups that were compared. Technical issues at baseline meant that the AGN completion rate was lower than at follow-up. Nevertheless, there was no evidence of systematic differences in participation between study phases: there were no differences between adolescents who completed the AGN and those who did not in terms of gender ($\chi^2 = .10, p = .753$ baseline; $\chi^2 = .09, p = .350$ follow-up) or depressive symptoms ($t = -.07, df = 282, p = .948$ baseline; $t(31.06) = .73, p = .474$ follow-up), although participants completing the AGN had higher IQ scores ($t(328) = -2.83, p = .005$ baseline; $t(328) = -4.32, p < .001$ follow-up).

2.2. Assessments

2.2.1. Emotional processing task

Participants completed the Affective Go/No Go task (AGN) task (www.camcog.com; Murphy et al., 1999) which takes approximately 10 min to administer. Sad and happy words are rapidly presented one at a time in the centre of a screen and participants are required to respond to words matching a target valence by pressing a button, while ignoring words of the other valence (distractor stimuli). The task consists of 10 blocks (2 practice and 8 experimental) of 18 words (nine happy and nine sad), each of which is presented for 300 ms, with an inter-stimulus interval of 900 ms. 45 happy words (e.g. joyful, confident) and 45 sad words (e.g. mistake, gloomy) matched for word length and frequency are presented randomly. In each block either happy (H) or sad (S) words are specified as the target valence, in one of the following randomly assigned presentation orders: HHSSHHSSHH, SSHHSSHHSS. The first two blocks are practice blocks. Of the eight experimental blocks, in four the target valence stays the same between blocks (non-shift condition), and in four the target valence changes between blocks (shift condition). In shift blocks participants are required to inhibit their previous response and respond to a new target valence, enabling assessment of set shifting and cognitive/inhibitory control. The task gives three outcome measures of interest: 1) mean reaction time to respond to target words in trials where the correct response is given (latency); 2) total number of button presses to distractor stimuli (commissions) and 3) the total number of missed responses to targets (omissions). A 500 ms/450 Hz tone sounded for commissions; however no feedback was given for omissions.

2.2.2. Psychopathology and derivation of groups

Adolescent psychiatric disorders and symptoms were assessed using the Child and Adolescent Psychiatric Assessment (CAPA; Angold and Costello, 2000), which is a semi-structured interview that provides a detailed assessment of psychopathology over the previous 3 months. Interviews were conducted separately with the parent and adolescent, and a disorder was considered present if a diagnosis was made based on either interview. All cases meeting DSM-IV criteria and sub-threshold cases were reviewed by two child psychiatrists and diagnoses agreed by clinical consensus.

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