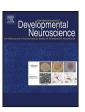
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Approach and avoidant emotion regulation prevent depressive symptoms in children with an Autism Spectrum Disorder



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ABSTRACT

The prevalence of depression is high in children with Autism Spectrum Disorders (ASDs), but its etiology has not yet been studied in this group. Emotion dysregulation is a well-known contributor to the development of depression in typically developing (TD) children, which might also apply to children with ASD. In this study, we examined the longitudinal relationship between three different ways of emotion regulation (approach, avoidance and worry/rumination) and depressive symptoms in children with ASD and a group of TD children which were compatible with the ASD group (age 9–15-years old). Children filled out self-report questionnaires at 3 time points (with a 9-month break between each session). To account for missing data multiple imputations were used. A regression model with clustered bootstrapping was used to establish which factors contributed to depression and to identify possible differences between the ASD and TD group. Approach and avoidant strategies prevented the development of depressive symptoms in both respective groups, whereas elevated levels of worry/rumination in turn increased children's depressive symptoms. Besides differences in absolute levels (children with ASD scored higher on symptoms of depression and lower on approach strategies than the TD group), no other differences between the groups emerged.

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1. Introduction

Besides the diagnosis for an Autism Spectrum Disorder (ASD), children and adolescents with ASD often show comorbidity with other psychiatric symptoms and disorders. One of the more common disorders found in children with ASD is depression, with a prevalence rate that fluctuates between 15% and 24% (Kim et al., 2000; Leyfer et al., 2006; Quek et al., 2012). This prevalence is considerably higher than in typically developing (TD) children, where the prevalence lies between 0.4% and 8.3% (Birmaher et al., 1996). Impaired emotion regulation is an important underlying mechanism for depression in TD children (Galaif et al., 2003; Seiffge-Krenke and Klessinger, 2000; Wright et al., 2010). Recently, more attention is given to problems in emotion regulation in children with ASD (Mazefsky et al., 2012). The question is, can depression in children with ASD be explained by the same factors of emotion regulation which are observed in TD children. Detection

of these factors at an early age would be important for professionals in order to better treat depression in this clinical group. Therefore, the focus of this study is twofold. First, to obtain more insight into the developmental pathway of emotion regulation in children with ASD relative to a comparable TD group. Second, in order to enhance treatment for depression in children with ASD, it is crucial to better understand its etiology and examine the extent to which emotion (dys)regulation contributes to the development of these depressive symptoms.

1.1. Coping and depression

Emotion regulation includes all processes that refer to modulating the intensity or duration of internal feeling states or motivational states, aiming at social adaptation or achieving individual goals (Eisenberg and Spinrad, 2004). One particular type of emotion regulation is coping. Coping is a way to control or modify the arousal level in negative emotion-evoking situations (Miers et al., 2007). Adaptive coping strategies lower the arousal level and reduce stress. Yet, the same situation can evoke different coping strategies in different people, depending on their prior experiences, current capacities and their (social) goals (Frydenberg, 1997).

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Hence, what defines an adaptive coping strategy might be different for ASD and TD children in similar situations (Rieffe et al., 2003).

Coping strategies can be broadly divided into two types: approach and avoidant strategies (Fields and Prinz, 1997). Approach strategies, like seeking social support and problem solving, are the most common strategies (Zimmer-Gembeck and Skinner, 2011). These approach strategies can give a sense of control (Kort-Butler, 2009) and are associated with fewer depressive symptoms in TD children (Abela et al., 2002; Gross, 1999; Nolenhoeksema et al., 1994). Children with ASD reported less use of approach strategies than their TD peers (Pouw et al., 2013), and strikingly, their use was unrelated to the level of depression in the ASD group (Rieffe et al., 2011). In other words, these studies suggest that approach coping strategies that are effective in reducing the level of arousal for TD children, are less effective for children with ASD.

Alternatively, avoidant strategies offer the possibility to shy away from the arousal-evoking situation or lower its importance, such as trivializing. The use of avoidant strategies seems associated with higher levels of depression in TD children (Seiffge-Krenke and Klessinger, 2000) but an opposite effect is found in children with ASD (Pouw et al., 2013). Possibly, avoiding a stressful situation might give children with ASD extra time at the onset of a stressor to gather resources, preventing the level of arousal to become too high. Yet, avoiding coping strategies might be helpful for children with ASD only as a short-term solution. The question is, if turning away from a stressful situation would also be of benefit for children with ASD on a long-term basis. A longitudinal design might shed further light on this issue, but to date studies on coping in children with ASD are all based on cross-sectional data.

1.2. Worry/rumination

Not everyone will approach a stressful situation in an adaptive way. Another kind of reaction toward a stressful situation is to worry or to ruminate. Worrying and ruminating refer to a maladaptive cognitive strategy that consists of thinking repeatedly about the arousal-evoking situation without coming any closer to a solution (Watkins, 2008). Some children can become immensely worried about what to do or what to expect, and think of all the possible worst-case scenarios. Worrying about being late, or about a lack of friends, does not help to decrease the level of a person's arousal. Still, it is a frequently observed reaction to an emotioninducing situation in children (Fields and Prinz, 1997; Rieffe et al., 2007). Not surprisingly, worrying is associated with higher levels of depressive symptoms in TD children (Abela et al., 2002; Gross, 1999; Nolenhoeksema et al., 1994). To the best of our knowledge, only one study to date has examined this topic in children with ASD and found higher levels of social worrying in ASD compared a TD group (Russell and Sofronoff, 2005). It has been argued that children with ASD might worry to a higher degree, because their social impairments give them more situations to be worried about (Bauminger and Kasari, 2000; Kelly et al., 2008). Additionally, a limited repertoire for adaptive problem-solving coping strategies could also magnify higher levels of worrying and rumination. More worry and rumination, in turn, could contribute to the explanation for more depressive symptoms in children with ASD.

1.3. Current study

The aim of the current study was to examine the effect which the three common forms of emotion regulation (approach and avoidant coping strategies, and worry/rumination), mentioned above, have on the predictability of depressive symptoms in children with ASD over a time period (3 time points with intervals of 9 months). The age range of 9–15 years was chosen, because a child's capacity to

reflect on his own emotions increases sharply during this age period (Harris, 1989). Based on the previous research, we expected less use of approach strategies (Rieffe et al., 2011) and more symptoms of depression in children with ASD than in TD children.

Yet, our main question was the extent to which the three strategies of emotion regulation would uniquely contribute to the prediction of depressive symptoms; and whether these contributions would differ for children with ASD and TD children. First, approach strategies (Rieffe et al., 2011) were expected to decrease the level of depressive symptoms for TD children, but not for those children with ASD (Pouw et al., 2013). Second, although a cross-sectional study by Pouw et al. (2013) showed that avoidant strategies were related to lower levels of depressive symptoms in children with ASD, Pouw et al. argued in their discussion that this effect might not stay over time. We indeed support their view that avoiding the emotion-evoking situation might only be a shortterm solution for children with ASD, and expected this effect not to be sustained across a longitudinal design. Third, we expected higher levels of worry/rumination to be associated with higher levels of depression for both groups (Abela et al., 2002; Gross, 1999; Nolenhoeksema et al., 1994).

2. Method

2.1. Participants

The group of children consisted of 81 high functioning children/adolescents diagnosed with ASD. Children with ASD were recruited from facilities that are specialized in treating and diagnosing autism. Diagnoses were based on the Autism Diagnostic Interview-Revised (Lord et al., 1994) administered by various child psychiatrists. Children with ASD had IQ indicator scores of 11.18 with a standard deviation of 3.17 (average 10). The differential diagnoses in the autism spectrum are presented in Table 1.

The TD group was composed of 131 children, which were recruited from primary and secondary schools in The Netherlands. TD children had IQ indicator scores of 10.59 with a standard deviation of 2.63 (average 10) and no diagnosed developmental disorders. The two groups did not differ in age, IQ indicator scores, or SES (see Table 1). The groups did differ substantially in the boy and girl ratio as could be expected (see Table 1), which was controlled for in the analyses.

2.2. Procedure

Participants were visited three times (with a 9-onths' time interval) at home or their institution. They were asked to answer questions which were presented on a notebook. All items were presented one by one on the computer screen with the response categories listed underneath. Children could select the best response by clicking the computer mouse on one of the responses that were shown. Once the child had clicked one of the items, the following item was presented automatically. Children were ensured that their answers would be anonymous. Parents were also asked to complete questionnaires which are not included in this study, except for the information needed to obtain SES scores. The Ethics Committee of Leiden University granted permission for the study.

2.3. Measures

The Child Depression Inventory (CDI; Kovacs, 1985) is a self-report measure containing 26 multiple-choice items about specific symptoms of depression (for example: "I feel alone"; "I am happy with the way I look"). The item associated with suicide was removed from the questionnaire. The original version consists of three sentences per item. We converted these sentences to one sentence with three response categories, in order to put a lower demand on children's working memory (Theunissen et al., 2011). An example item is "I am tired", which children could answer on a 3-point response scale (1 = sometimes, 2 = often, 3 = always). Scores on positively formulated items were reversed. The internal consistency of the adapted version was good $\alpha > .7$ (Nunnally, 1978) (see Table 2). The CDI is widely used, and has good internal consistency, test–retest reliability, and concurrent validity (Masip et al., 2010). The adapted version that we used in this study has high correlations with the original version r=.75, p=.000 (Theunissen et al., 2011).

The Coping Scale (Wright et al., 2010) is a self-report measure which consists of 34 items. Children were asked what they would do if something bad happened. Two different coping strategies are assessed: 12 items that measured Approach (example items: "I tell a family member or a friend what has happened", "I try to find a solution for the problem"), and 12 items that measured Avoidant (example items: "I'll do something that makes me forget the problem", "I would say that I don't care"). Response categories were: almost never = 1, sometimes = 2, and often = 3. The internal consistency was good (see Table 2). The test–retest reliability is found adequate

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