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Willemen, A.M.

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General Discussion

The present thesis focused on the mechanisms through which personal and family factors influence the persistence and changeability of psychopathology in children and adolescents referred for mental health services. Prolonged levels of stress are assumed to put children at risk for the persistence or reoccurrence of psychological problems (Bradley, 2000), while emotion regulation competencies may help children to deal with stress. Children's emotion regulation is learned in the context of and partially dependent on the parent-child relationship. Therefore, mechanisms of emotion regulation in response to stress were studied within the context of the parent-child relationship. Firstly, the risk effects of stressful life events and perceived stress on the course of psychopathology in referred adolescents were estimated. Secondly, the validity of a stressful paradigm was investigated by examining observations of parent-adolescent interactions and physiological indicators of emotion regulation in clinical and non-clinical adolescents. Although children gradually increase their ability to regulate their distress by themselves, the parent-child relationship may continue to function as a secure base facilitating the alleviation of distress in adolescents. This may particularly be the case when distress is too high or too complex to be regulated by the adolescents themselves, or when adequate regulation skills are compromised, which is likely the case among adolescents with a history of psychopathology. Therefore, thirdly, it was investigated whether the role of parent-adolescent interactions in the regulation of stress is different for adolescents with low or high levels of psychopathology. Finally, it was examined whether observed parent-adolescent interactions are indicative of protective influences of parent-adolescent relationships on psychological problems in referred adolescents.

The current chapter summarizes and integrates the results of the previous chapters. In addition, the strengths and limitations of the study will be addressed and possible clinical implications will be discussed.

Summary and Conclusions

This thesis described four studies based on three different samples. The first study made use of a sample of children and adolescents between 6 and 18 years old who were referred for mental health services (Bastiaansen et al., 2005b) and were

followed-up one (Time 2) and four years later (Time 3). At each measurement wave questionnaires were filled in by parents (Child Behavior Checklist; Achenbach, 1991a) and children (Youth Self-Report; Achenbach, 1991b) to obtain standardized measures of psychological problems. Stressful life events were reported by parents and perceived stress by both parents and adolescents. For the third and fourth study, a sub-sample of 102 families was selected who participated in the intensive part of the study (Time 3). During a home visit, the Family Interaction Task (Weinfield et al., 1999) and the Alarm Stress Task (AST) were administered to obtain observations of parent-adolescent interactions. Secure base behaviour during the AST was coded following the Secure Base Scoring System (Crowell et al., 1998). When adolescents performed the AST, a range of physiological indices were obtained including heart rate, and indicators of parasympathetic and the sympathetic activity. In the second study, data from two separate samples were reported. Twenty adolescents currently involved in outpatient treatment and twenty adolescents from the community were visited at home where the AST was administered.

The first study (Chapter 2) focused on the role of stress on the course of psychopathology in children and adolescents after their referral to an outpatient clinic for mental health services. At three waves across four years, parents and children reported emotional and behavioural problems, as well as stressful life events and perceived stress. The findings indicated that internalising and externalising problems in children declined after referral. However, large variation between individuals was found. Stressful life events were found to predict higher levels of internalising and externalising problems and were associated with a slower recovery from internalising, but not externalising problems across time. Earlier studies with referred children also found significant associations between life events and the course of psychopathology. However, follow-up intervals were short and both predictor and outcome were reported by parents (Mathijssen et al., 1999). The results in the first study of this thesis add to the existing literature because the effects were found across informants and across a longer follow-up time, indicating that referred children remain vulnerable for the experience of stressful life events.

Prolonged levels of perceived stress are assumed to put children at risk for persistent or reoccurring psychological problems (Bradley, 2000). Therefore, the mediating role of perceived stress was investigated to further understand how stressful life events affect the course of psychological functioning in referred children.

Perceived stress was reported by children themselves as the experience that demands of daily life are beyond their abilities to cope. The results were consistent with the hypothesized model in which perceived stress explained the effects of life events on both initial level and course of psychopathology. It was concluded that for referred children the experience of life events increases the perceived difficulty to meet the demands of daily life, which in turn increases the vulnerability for the continuation or reoccurrence of psychological problems.

In the second study (Chapter 3) a new stressful paradigm, the Alarm Stress Task, was developed to investigate adolescents' regulation of physiological arousal in the context of the parent–adolescent relationship. Existing stress paradigms were not suitable for studying affect regulation within the context of parent–child interactions, because they may not be stressful beyond pre–school age or require activities that may interfere with parent–child interaction. The Alarm Stress Task is a simple task which presumably all adolescents can succeed at (lying quietly on a bed), but for which they invariably are led to believe that they fail it. Irrespective of their actual movements, a computer alarm is set off twice, indicating that they do not lie quietly enough. The experimental stressor was assumed to produce physiological arousal in need of regulation. In such a situation, seeking information and support from an attachment figure was considered an adaptive emotional response. Whether adolescents and parents use these behaviours to adapt to the arousal, was assessed by reuniting the adolescents twice within the procedure with their attachment figure (the adolescent's mother or father). Physiological reactivity was studied after exposure to the stressor and during reunion with the primary caregiver. A range of physiological indices were obtained including heart rate, and indicators of parasympathetic (respiratory sinus arrhythmia) and sympathetic (pre–ejection period) activity. Clinical and non–clinical adolescents were compared in their physiological reactivity and behavioural interactions with their parents.

The findings indicated that the stressor elicited a stress response, which was most clear in the sympathetic branch of the autonomic nervous system. In addition, the task was shown to allow reliable ratings of parent–adolescent secure base interaction. When adolescents were reunited with their parents after the alarm, and in particular when they approached their parent for support, parasympathetic activity increased. These findings confirmed Porges' hypothesis that social engagement is associated with emotion regulation as indicated by increases in parasympathetic

activity (Porges, 2003a). No differences were found between clinical and non-clinical adolescents in their physiological reactivity to stress and reunion. However, parents and adolescents in the clinical sample showed less secure base behaviour. Adolescents in the clinical sample showed a less clear and direct expression of the desire for support from the parent and were less easily comforted, while their parents showed less correct understanding of the adolescent's distress and showed less readiness to and effectiveness in supporting the adolescent compared to parents of non-clinical adolescents. It was concluded that individual and relationship-based processes of affect regulation can be simultaneously assessed in the Alarm Stress Task. The results were first evidence that the parent-child relationship continues to be important for affect regulation and mental health in adolescents.

The third study (Chapter 4) focused on physiological regulation within the relationship between parents and referred adolescents. Again the Alarm Stress Task was used to obtain measures of physiological reactivity and recovery and observations of parent-adolescent secure base interactions. In this study the focus was specifically on the question whether adolescents with high levels of psychological problems benefit more from high quality secure base interactions with the parent, as indicated by better physiological regulation. As expected, adolescents with high levels of externalising problems and high quality parental secure base support, showed improved physiological regulation. Specifically, parasympathetic reactivity and recovery were increased in high externalising adolescents when parents show high quality secure base support. Increased parasympathetic activity was not found for adolescents with a tendency towards internalising problems. Adolescents with internalising problems were found to express their secure base behaviour less explicitly and parent and adolescent secure base behaviours were less attuned to each other compared to externalising adolescents. Furthermore, it was found that adolescent secure base seeking behaviours during reunion were related to increased sympathetic reactivity after the stressor. Moreover, sympathetic recovery was increased in adolescents who displayed their distress to their parent during reunion. It was concluded that the physiological regulation of stress in adolescents at risk for psychopathology was facilitated when adolescents openly display their distress to a positively involved parent, especially in adolescents with externalising problems.

The fourth and final study of this thesis (Chapter 5) examined whether parent-adolescent interactions were indicative of a protective effect of the parent-adolescent

relationship against the deleterious effects of stressful life events on the course of psychopathology. Specifically, it was examined whether the effects of life events on psychopathology were smaller when adolescents had high quality interactions with their parents. Earlier studies into the protective effect of the family context in times of stress have mainly relied on questionnaires, rather than on actual observations of parent and adolescent behaviour. Observations of the parent–child relationship have been shown to be stronger predictors of adjustment and less biased indicators compared to questionnaires, because they focus on what individuals actually do and are less confounded by individual perceptions and expectations. Therefore, parent–adolescent dyads were observed during an interaction task in which they collaborated on four structured tasks, in which parent, adolescent and the dyad were coded on autonomy behaviour and, and positive and negative affect.

The results indicated that the effects of stressful life events on adolescents' internalising and externalising problems four year after referral were weakened when parent-adolescent interactions were characterized by high autonomy and low hostility. In these interactions, parents provided assistance in understanding and structuring the tasks, but allowed the adolescent to engage in self-directed problem solving whenever possible. In addition, these interactions were characterized by adolescents who strove for autonomy during the interactions, as indicated by keeping focused and goal oriented during a difficult task and explaining their own opinions and wishes. Finally, adolescents and parents did not show any signs of anger, rejection or hostility in their interaction. Post-hoc analyses revealed that positive affect of parents (such as responding to adolescents' need for emotional support), rather than positive affect of adolescents or the dyad, were also indicative of protective effects. In conclusion, high quality interactions between parents and their vulnerable adolescents were indicative of protective effects for referred adolescents, especially for the effect of life events on internalising and externalising problems.

Strengths and Limitations and Directions for Future Research

The current thesis has contributed to existing knowledge of factors that influence the persistence and change of psychopathology in referred children and adolescents. Until now, studies with referred children were mainly descriptive, focusing on the epidemiological aspects of the course of psychopathology after referral (Heijmens Visser et al., 1999). A small number of studies focused on related

factors, such as life events, quality of life and family relations of referred children (Bastiaansen et al., 2005a; Bastiaansen et al., 2004; Mathijssen et al., 1999). This thesis extended earlier studies on the link between stress and psychopathology in referred children by showing that perceived stress mediates the relation between parent-reported stressful life events and the persistence of psychopathology over time. This thesis showed that mechanisms shown to produce risk or to be protective in the general population also applied to adolescents, particularly for adolescents vulnerable for the development of psychopathology. Future studies should not only focus on further identifying these risk and protective mechanisms, but also on the question whether improvement of these factors would actually improve recovery in referred children.

In addition to the literature on referred children, the current thesis contributed to the literature on the role of the attachment relationship during adolescence in the context of stress and psychopathology. Until now, the role of the parent-child relationship for child emotion regulation was limited to studies into young children. The Alarm Stress Task is the first paradigm for adolescents that enables to measure physiological regulation within the context of the parent-child relationship, while movement artifacts were limited. Synchronized assessment of physiological and behavioural responses revealed the process of affect regulation that explains how secure base interactions with parents protect adolescents against the effect of stress. This paradigm might enable future studies to elaborate on the potential physiological mechanisms underlying attachment relationships and their influence in both clinical and non-clinical groups. In addition to these physiological mechanisms, it might be interesting to investigate the effects of adolescent attitudes and cognitions regarding stress, own competence and the parent-child relationship on the regulatory process.

In the current thesis, effects of stress and the parent-child relationship were separately examined for internalising and externalising problems, to account for variations in emotion regulation tendencies. Stress and quality of parent-adolescent interactions appeared differently related to adolescents' internalising and externalising problems. Internalising, but not externalising problems showed a slower recovery after occurrence of life events (Chapter 2). Also, life events remained significantly associated with internalising, but not externalising problems, after perceived stress was included as a mediator. Thus, effects of life events appeared stronger for

internalising compared to externalising problems. In Chapter 4 we found that externalising problems showed stronger associations with parasympathetic reactivity and recovery during a stressful situation, when the support from their parents was high. Responsive reactions from parents improved the regulation of stress for adolescents with externalising, but not internalising problems. Internalising adolescents expressed their secure base behaviour less explicitly and parent and adolescent secure base behaviours were less attuned to each other compared to externalising adolescents. Nevertheless, in Chapter 5, high quality of parent-adolescent interactions was indicative of protective effects for both internalising and externalising problems after the experience of life events. Possibly, this discordance might have something to do with the design of Chapter 4, where physiological recovery is measured in a short time span. Further research is needed on factors that promote emotion regulation and resiliency in adolescents with internalising and externalising problems. Differentiating between behavioural tendencies in studies into emotion regulation is highly recommended.

Although this study accounted for variations in emotion regulation tendencies between adolescents with internalising and externalising problems and yielded clear results, it did not account for different subtypes of behavioural and emotional problems. For example, it might well be that some of the effects found for externalising problems are mainly attributable to children with Attention Deficit Hyperactivity Disorder, who tend to strongly react to stressful circumstances, rather than to children with Conduct Disorder, who tend to under react, at least physiologically (Raine, 1993). The topics addressed in this study need still to be addressed in samples including sufficient numbers of children with specific subtypes of problems.

There are also some limitations that should be noted. Firstly, although the AST provides a unique paradigm to measure adolescent secure base behaviours, it remains unclear whether these behaviours reflected the history of interactions, as originating from the attachment relationship. Secondly, although this study benefited from a longitudinal design, observations of the parent-adolescent relationship were only administered at the third measurement wave. Therefore, we were not able to investigate whether a secure parent-child relationship actually *predicted* recovery of psychopathology. Finally, information about treatment or family counselling is not included into the analyses, although these factors may importantly influence the

dealing with stressful life events. Therefore, no conclusions about treatment effects may be drawn on the base of this thesis.

General Conclusion

This thesis indicated that recovery from psychological problems in children with a history of mental health problems is threatened by stressful life events through increasing children's perception of stress in daily life. The perception that demands of daily life are beyond their ability to regulate especially threatened the recovery from internalising problems. This vulnerability places referred children in a situation of 'permanent risk' (Koot, 1999) for the maintenance or reoccurrence of internalising problems. Parent-adolescent interactions characterized by sensitive and responsive parental reactions to adolescents' display of concerns facilitated adolescents' regulation of emotion and protected adolescents against the deleterious effects of stress on the level of psychopathology. This study showed that the attachment relationship between parents and children continues to be important for vulnerable adolescents and the regulation of stress.

This thesis showed that adolescents who have secure relationships with their parents in times of stress have lower levels of psychological problems compared to adolescents without these supportive relationships. It should be noted that demonstrating this does not necessarily mean that children's psychological problems had the origins in disturbed parenting. It is one thing to demonstrate that higher parenting quality leads to reductions in the child's disruptive behaviour, it is quite another thing to say that it was the poor parenting that caused the disturbance in the first place.

The results of this thesis suggest that parental behaviours of sensitivity and involvement with adolescents' concerns, as well as behaviours of granting adolescents' autonomy and stimulating independency improve adolescent resiliency. These qualities of the parent-child relationship correspond to the function of the attachment relationship between children and their caregivers. According to the attachment theory, infants use the parent-child relationship to find security in times of stress and to feel confident to explore the world (Waters & Cummings, 2000). The adolescent's task of establishing autonomy is functionally similar to the infant's task of exploring the environment from the secure base of the parent-infant relationship (Allen et al., 2003). In infancy, exploration focuses on discovering the physical

environment. In adolescence, however, exploration is more focused on the adolescent's emotional and cognitive independence from parents (Allen et al., 1994). The results of this thesis indicate that both qualities of the secure base are involved in the relationship between parents and their adolescents.

Clinical Implications

Notwithstanding the large investments in psychiatric treatment, psychological problems in referred children have the tendency to remain high or return after a period of recovery. This thesis focused on understanding the particular processes that are involved in the development and maintenance of psychopathology in these children and adolescents, in order to provide some building blocks for interventions aimed to improve recovery of psychopathology in the end. The findings of the studies allow us to make some tentative recommendations for the treatment of referred children and adolescents.

First, children that perceive high levels of stress after the experience of life events are less likely to recover from psychological problems after referral. This appeared especially the case for children with internalising problems. Interventions that focus on skills that promote feelings of control and self-confidence in times of stress, may decrease the level of perceived stress and may prevent children from the continuation of psychopathology after the exposure to life events. Therefore, in line with existing intervention programs for depression and anxiety, especially those that originated within the cognitive behaviour therapy tradition (e.g., Barrett, 1998), intervention efforts need to focus on teaching children to identify their incorrect thoughts and provide them cognitive skills for more realistic evaluation of the stressful situation and their resources in times of stress. In addition, these adolescents might be taught to turn to competent adults for support.

Second, it is frequently assumed that during adolescence, interventions should focus primarily on adolescents themselves. However, the results of this study indicate that parents play an important role in supporting their adolescent children in the regulation of stress. It is therefore important to acknowledge that the relationship between parents and adolescents needs professional attention. To support the development of adolescent autonomy and independence, it should be acknowledged that adolescents need their parents to discuss their concerns and find solutions and comfort.

Professional acknowledgment of the emotional bond between parents and adolescents may result in the explicit implementation of the quality of the parent-adolescent relationship in the diagnostic process as a risk factor for regression or a potential protective or promoting factor for recovery. In addition, interventions may offer training and support for parents and adolescents involved in treatment settings. Multisystemic treatment (Henggeler & Borduin, 1990) and functional family therapy (Alexander & Parsons, 1982) are examples of interventions that emphasize the role of the parent-adolescent relationship, and have shown to improve adolescent adjustment problems (Kazdin, 1997; Waldron & Turner, 2008).

In line with existing attachment-based family intervention programs (Diamond, Siqueland, & Diamond, 2003), intervention efforts need to focus on the emotional bond between parents and adolescents. Events from history and actual behaviours might have importantly affected the perceptions of adolescents and parents about trusting each other to develop a secure base relationship. Therefore, feelings of insecurity, irritability, anger, or sadness that hamper the willingness or possibility to contribute to the secure base relationship have to be discussed with both parents and adolescents separately. Therapists may help parents and adolescents to improve their secure base relationship. Parents need to learn to be alert and aware of adolescents' feelings and to show that he or she is available and responsive at moments of distress. For adolescents with internalising problems, parents and adolescents need to attune their secure base behaviours. Adolescents may need help to learn to approach the parent in times of stress and to openly display his or her concerns to the parent. Furthermore, parental responses may focus more directly on the meaning and appraisal of stressors and on regulation strategies that are adequate in a stressful situation. Finally, a situation should be created in which both adolescents and parents feel secure to discuss adolescents' concerns. The ultimate goal is that parents and adolescents improve their skills to maintain a high-quality secure base relationship in daily life. This is a general tenet, but seems especially important for adolescents with a history of behavioural and emotional problems. It may help prevent the reoccurrence of these problems even years after referral to mental health services, and enhance a sound development into adulthood.