Chapter 7

CONCLUSIONS AND GENERAL DISCUSSION
We started this thesis by asking why it is important to study disruptive behavior in girls. The empirical papers and literature reviews presented in the previous chapters show that the study of explanatory factors in girls, compared to boys, is underdeveloped. Although the number of studies has increased in recent years, a gender-sensitive contextual model that explains and predicts girls’ disruptive behavior has yet to be formulated. The need for such a model is supported by some limited research suggesting that there are some distinct gender differences in the phenotype, prevalence rates and course of disruptive behavior. Key differences include a) lower prevalence rates of disruptive behavior in childhood in girls compared to boys; b) higher rates of relational aggression than physical aggression (Crick & Grotpeter, 1995) among girls; and c) a faster increase in disruptive behavior among girls from early to late adolescence (e.g. Scaramella, Conger & Simons, 1999; Galambos, Barker & Almeida, 2003). Gender-specific contextual differences also exist. For example, girls are exposed to different parenting practices compared with boys (see review by Keenan & Shaw, 1997). Among these differences is that parents tend to focus on interpersonal relationships in girls by emphasizing the need for prosocial behaviors such as considering the personal consequences of their actions, and the need to control/mask their feelings of anger and aggression. Furthermore, girls, in contrast to boys, tend to be treated by their parents with less aggression and physical punishment, and with more warmth (Lytton & Romney, 1991; Zahn-Waxler & Polanichka, 2004) and tend to be more closely supervised by their parents (Hagan, 1989; Kim, Hetherington & Reiss, 1999).

The main objectives for this thesis were threefold. The first objective was to examine the development of disruptive behavior in girls aged 7 to 12 years old. We addressed this objective by empirically studying a sample of 7- and 8-year-old girls from the Pittsburgh Girls Study that had been followed up annually for five consecutive years. The second goal was to examine individual, family, peer and neighborhood explanatory factors in the development of girls’ disruptive behavior. To address this goal we conducted empirical studies and reviewed the existent literature. The third objective was to create a gender-sensitive model for girls’ disruptive behavior, based on the empirical studies and reviews of the literature, which included factors related to individual characteristics, family functioning, peer affiliation and neighborhood residence. We studied both risk (e.g. disadvantaged neighborhood) and protective factors (e.g. positive parenting) because the joint consideration of risk and protective factors has been shown to improve the prediction of a negative outcome (Stouthamer-Loeber, Loeber, Wei, Farrington & Wikström, 2002).
By also examining interaction effects, we tried to move beyond identifying a list of risk factors for disruptive behavior in girls, and instead searched for mechanisms that could potentially explain the links between risk factors, protective factors and outcomes.

This chapter addresses the three objectives and presents an overview of the findings described in the previous chapters. We will also address limitations of the studies in this thesis and opportunities for future research. Lastly, we will discuss the clinical implications of the findings.

7.1 Summary of key findings

7.1.1 Objective 1: The development of disruptive behavior in 7- to 12-year-old girls

Growth curve analyses in chapters 2 and 6 showed that mean levels of teacher-reported disruptive behavior (ODD and CD symptoms) first slowed down and then increased as the girls aged closer to 12 years (quadratic growth). These findings are in accord with previous studies regarding the developmental course of girls' disruptive behavior that showed a slight and gradual decrease with increasing age during the childhood period (Broidy et al., 2003; Côté, Zoccolillo, Tremblay, Nagin, & Vitaro, 2001; Harachi et al., 2006; Lahey et al., 2006; Odgers et al., 2008; Schaeffer et al., 2006). The findings also agree with studies on adolescents, in which girls, compared to boys, showed a faster increase in disruptive behavior from early to late adolescence (Scaramella, Conger & Simons, 1999; Galambos, Barker & Almeida, 2003). Furthermore, our findings showed that there was significant individual variability in the pattern of disruptive behavior over time, which supports the notion that different subgroups of girls follow differential developmental patterns (Côté et al., 2001; Moffitt et al., 2001).

Chapter 3 examined the development of one problem behavior that is a particular feature of girls' disruptive behavior: relational aggression. The findings showed that the mean levels of teacher-reported relational aggression decreased in a linear way between ages 7 and 12 years. Although previous research has reported increasing rates in middle childhood (e.g. Murray-Close, Ostrov & Crick, 2007; Vaillancourt, Miller, Fagbemi, Côté, & Tremblay, 2007), methodological differences between the current and prior research may account for the discrepancy in findings. For instance, different effects may be revealed by using teacher- compared with peer-reports. Girls may become more subtle in the ways they display aggression with age, and as a result, teachers, compared to peers, may become less
aware of relational aggression. This may reflect the fact that girls’ social skills (behavioral and social-cognitive) become more sophisticated as they age and overt expression of aggression becomes increasingly inappropriate. As a result, relational aggression may become less visible to teachers (Crick et al., 1999). Our findings furthermore showed significant heterogeneity in initial levels of relational aggression but similar rates of change for all girls, indicating that girls who scored highest at the first assessment remained highest across the entire growth curve (relative stability; i.e., the individuals’ rank order within a group does not change over time); suggesting a trait-like quality to relational aggression. This notion of relative stability is consistent with previous findings (Zimmer-Gembeck, Geiger & Crick, 2005) and is further supported by the fact that girls’ relational aggression in the current study was assessed by different teachers in successive grades of elementary schools. Our findings also showed a linear decrease in relational aggression between girls’ ages 7 to 12, whereas ODD and CD symptoms showed a quadratic shape during the same time span. This differential finding may mean that an increase in relational aggression lags behind; i.e. if girls would be followed up longer, an increase in relational aggression may become evident.

Taken together, the findings in the present thesis show that the transition from childhood to early adolescence appears to be a crucial period for the development of disruptive behaviors in girls and that heterogeneity in developmental patterns exists among girls; some girls, for instance, show higher initial levels of disruptive behavior and slower decreases over time. These might be the girls that are characterized by more serious outcomes later in life, have poorer responses to treatment and are exposed to more risk factors.

7.1.2 Objective 2: The examination of individual, family, peer and neighborhood explanatory factors in the development of girls’ disruptive behavior

The summaries of findings in the subsequent subparagraphs will vary in length due to the fact that the reviews of the literature have been conducted pertaining to family and neighborhood factors and do not cover the other domains.

*Individual characteristics*

Chapter 2 showed that callous-unemotional features (CU) appeared to be associated with chronic high levels of disruptive behavior in girls, thus contributing to the emerging
evidence that the presence of CU features in girls is associated with a particularly severe and persistent form of antisocial behavior (for a review see Frick & White, 2008). Although some degree of self-centeredness and lack of concern is normative in young children, mid-to late childhood may be an important developmental period for identifying CU behaviors as precursors to subsequent antisocial behavior (Hipwell et al., 2007). Thus, during this developmental period, one would expect healthy children to become increasingly aware of the importance of considering others' needs (Eisenberg & Fabes, 1998), to accept personal responsibility for one's own behavior, and to feel guilty after doing something wrong (e.g. Kochanska, 1994). Alternatively, among children with disruptive behavior a reduction in concern for others has been shown to emerge around ages 6 to 7 (Hastings, Zahn-Waxler, Robinson, Usher & Bridges, 2000).

It is important to bear in mind however, that several other individual risk factors associated with disruptive behavior (e.g. victimization, educational failure) may also be related to CU features. For instance, Weiler and Widom (1996) reported high levels of CU features in children who had been victims of childhood abuse and/or neglect. The latter data were not available for examination in the current thesis. It thus remains unclear whether the association between disruptive behavior and CU in young girls may be better accounted for by other “third” variables that were not included in our analyses.

Family functioning

The literature review in chapter 4 focused on family-linked risk and protective processes in the development of girls’ disruptive behavior and showed the importance of including family functioning when studying the etiology and developmental course of girls’ disruptive behavior. To summarize key aspects of the review, parental socialization has been suggested as a potential explanation for a lower overall prevalence of disruptive behavior in girls compared to boys (Crick & Zahn-Waxler, 2003; Keenan & Shaw, 1997; Maniadaki, Sonuga-Barke & Kakouros, 2003; Zahn-Waxler & Polanichka, 2004). Girls’ typical socialization focusing on interpersonal relationships, and suppression of anger and curtailing aggression may, for example, explain why girls tend to show less physical aggression than boys, and use relational aggression instead. In addition, higher levels of parental supervision and monitoring tend to be associated with higher rates of secure attachment relationships between parent and child. Securely attached children internalize the values of their parents and in turn are less likely to become affiliated with deviant peers.
(Giordano, Cernkovich & Pugh, 1986). Evidence pointing in the same direction comes from studies indicating that normative gender-differentiated parenting styles become disrupted for children with conduct problems (e.g. Webster-Stratton, 1996). The literature review furthermore showed that there is some evidence from prospective studies that a suboptimal child-rearing environment (low levels of parental monitoring, and high levels of psychological control, coercive parental discipline and conflict) is linked to early onset disruptive behavior in girls. These girls may have developed disruptive behavior in the absence of the protective effects of parenting. It may, however, also be the case that the socially deviant nature of the girls' behavior causes disruptions in the child-rearing environment, which in turn, is likely to further increase or escalate the girl's disruptive behavior. Studies on the reciprocal association between child disruptive behavior and parental behavior provide support for this hypothesis (Hipwell et al., 2007; Huh, Tristan, Wade & Stice, 2006). In addition, girls who display aggressive, antisocial tendencies are more likely, due to the existing gender stereotype, to be rejected by their parents, teachers and peers. This, in turn, further increases the risk of developing disruptive behavior and may potentially explain the existence of the small subgroup of girls that shows disruptive behavior from early childhood onwards. In adolescence, we found some evidence for a connection between decreasing levels of parental monitoring and warmth and increasing levels of parent-adolescent conflict, and the emergence of disruptive behavior, at least for some girls. The transition from childhood to adolescence is also marked by an increase in time spent with peers outside the home, therefore increasing the influence of peers and potentially reducing the protective effects of positive parenting behaviors.

The empirical study presented in chapter 2 showed that parental warmth is of particular importance in the development of disruptive behavior in girls between 7 to 12 years. Girls who were exposed to low parental warmth had higher initial levels of disruptive behavior at age 7. In addition, from age 10 onwards girls exposed to low parental warmth experienced an escalation in disruptive behavior relative to girls in families with high parental warmth. Girls exposed to lower parental warmth showed higher levels of disruptive behavior across the entire time span from ages 7 to 12. The influence of low parental warmth on the development of disruptive behavior in girls may be explained by the fact that girls, partly as a result of gender-typical parental socialization, show a greater orientation to interpersonal relations and higher sensitivity to rejection than boys (e.g. Gabriel & Gardner, 1999; Maccoby, 1990). This orientation and sensitivity towards
interpersonal relationships, in turn, is likely to cause girls to be particularly affected by disruptions in their childrearing environment such as high levels of familial conflict and suboptimal parenting.

Contrary to our expectations and in disagreement with our findings on ODD and CD symptoms in chapter 2, low parental warmth did not predict girls' relational aggression (empirical study in chapter 3). It is possible however that an indirect, rather than a direct relationship exists, and that low parental warmth leads to negative self-perceptions which, in turn, are related to relationally aggressive behaviors, especially among girls (Moretti, Holland & McKay, 2001). Harsh punishment, however, predicted higher levels of relational aggression across the entire time span, similar to results found for overt aggression in previous research (for a review see Coie & Dodge, 1998). As a result of harsh punishment children may learn to use alternative, manipulative strategies for achieving their goals, because the costs of more overt forms of aggression are too high (i.e. to avoid harsh punishment).

The empirical study in chapter 2 also examined harsh punishment as an explanatory factor for girls' disruptive behavior (ODD and CD symptoms). Contrary to expectations, parent reports of harsh punishment were not associated with teacher-reported ODD and CD symptoms. Longitudinal evidence has suggested that the relation between physical punishment and increases in teacher-reported disruptive behavior is most pronounced during the early elementary school years in boys, but this detrimental effect dissipates quickly (Pardini, Fite, & Burke, 2008). It is possible that the girls in the present study may have passed the developmental period in which harsh parenting practices most often result in poor behavioral functioning.

Findings from the empirical studies furthermore showed that parental stress and positive parenting were not associated with girls' disruptive behavior. These family factors may, however, be indirectly associated with girls' disruptive behavior, i.e. exert their influence through other factors. Positive parenting may, for example, cause children to do well in school, which, in turn, decreases the likelihood of their developing disruptive behavior. In the case of parental stress, it may also be that by controlling for welfare status (as a proxy for the family's socio-economic status) and family composition (e.g. single parenthood), the effect of parental stress disappeared in the current analyses. In addition, the inclusion of neighborhood disadvantage in the analyses may also have caused the effect of parental stress to disappear.
Peers

The empirical study presented in chapter 2 showed no prospective associations between child reports of deviant peer group affiliation and teacher-reported disruptive behavior. This may be due to sample characteristics (e.g., age and gender). It may also support the notion, however, that parental influence is of greater importance than peer influences in the development of girls’ disruptive behavior in middle childhood. A previous study using a sample from the Pittsburgh Girls Study had suggested that prospective associations between deviant peer group affiliation and both parent- and teacher-reported conduct problems in young girls are negligible after controlling for factors such as dysfunctional parenting and prior behavior (Miller, Loeber & Hipwell, 2009). The notion that parental influences are likely to be more influential in the development of girls’ disruptive behavior in childhood, while the influence of peers increases over time as young girls enter into adolescence, was also supported by our findings in chapter 3. Although affiliation with deviant peers at girls’ ages 7 and 8 was not concurrently associated with relational aggression at the same age, it did predict subsequent relational aggression at ages 11 and 12. It remains unclear, however, whether this is best explained by selection effects (children actively seeking out friends who are similar to themselves on certain salient behavioral characteristics), socialization effects (similarity among friends developing over time as a result of influence operating within the friendship relationships), or a combination of both. Since high levels of relational aggression have been shown to be associated with peer difficulties (Crick, 1996; Crick et al., 1999; Werner & Crick, 2004), affiliation with deviant peers at ages 7 and 8 may lead to persistent social/interpersonal difficulties and relational aggression for a subgroup of girls. In addition, deviant friends may exert a stronger influence on children who already show disruptive behavior. Findings have shown that preadolescents who were initially moderately antisocial were particularly vulnerable to negative peer influences (Vitaro, Tremblay, Kerr, Pagani, & Bukowski, 1997).

Neighborhood residence

The literature review in chapter 5 showed that girls as well as boys residing in disadvantaged neighborhoods show more problem behavior than those in advantaged neighborhoods. Although the neighborhood effects tend to be small to moderate, they still can be observed in mixed samples of males and females, even after controlling for demographic and family level variables (e.g. Brooks-Gunn et al., 1993; Greenberg, Lengua,
Coie & Pinderhughes, 1999; Leventhal and Brooks-Gunn, 2000). At the time of the review it was unclear whether “true” neighborhood effects on problem behavior also existed in female-only samples. In answer to this question, the empirical study in chapter 6 presented findings showing that the effect of growing up in a low SES neighborhood (as defined by census data) on the development of girls’ disruptive behavior remained significant after taking into account socio-demographic and family factors. This was true for the entire period of ages 7 to 12, which is consistent with the existent literature showing that neighborhoods effects on children’s behavior (regardless of gender) are thought to emerge at the time of entry into elementary school (Chase-Lansdale & Gordon, 1996). Unfortunately we were unable to test for nested effects in the research paper to also account for the notion that families are not randomly distributed across neighborhoods (e.g. Tienda, 1991).

The review of the literature in chapter 5 furthermore indicated that girls in disadvantaged neighborhoods are exposed to a larger number of risk factors, including exposure to different forms of community and family violence, suboptimal parenting and affiliation with deviant peers. The empirical study in chapter 6 confirmed this conclusion by showing that parents in disadvantaged neighborhoods (as defined by census data) experienced significantly more stress than parents in the non-disadvantaged neighborhoods. Parents in disadvantaged neighborhoods also used more harsh punishment than parents in the non-disadvantaged neighborhoods, which is consistent with previous findings in mixed-gender samples (Furstenberg, 1993; Klebanov, Brooks-Gunn, & Duncan, 1994). These findings indicated that parental behavior may be an important mediating factor in explaining neighborhood effects on girls’ disruptive behavior, as suggested in chapter 5. In contrast, other findings showed that low parental warmth and positive parenting did not differ by neighborhood SES. The use of harsh punishment and levels of parental warmth, however, appeared to be confounded by race. While levels of parental warmth, for example, did not differ by neighborhood SES in African American families, European American families in disadvantaged neighborhoods displayed lower levels of warmth compared to European American families in non-disadvantaged neighborhoods. This showed the importance of taking into account ethnicity when studying the neighborhood context of parental behaviors.

The analysis in chapter 2 focused on parent report of neighborhood risk as opposed to risk defined by census data. The findings indicated that parent reported neighborhood
risk was associated with the pattern of change in girls’ disruptive behavior. Girls residing in high-risk neighborhoods, compared to girls in non-disadvantaged neighborhoods, exhibited higher levels of disruptive behavior as they progressed through middle childhood, but this differential effect disappeared in early adolescence. Close evaluation of this effect revealed that girls in high-risk neighborhoods did not seem to experience an escalation in disruptive behavior during childhood. Instead, they were more likely to exhibit stable levels of disruptive behavior in middle childhood, while girls in low-risk neighborhoods experienced a decrease in disruptive behavior during the same developmental period. This finding elucidates that the positive association between neighborhood risk and disruptive behavior does not mean that girls in disadvantaged neighborhoods show an escalation in their conduct problems over time, but rather, a slower deceleration than girls in non-disadvantaged neighborhoods. Phrased differently, fewer girls in disadvantaged neighborhoods outgrow disruptive behavior compared to girls in non-disadvantaged neighborhoods.

Taken together, the findings show that girls who grow up in disadvantaged neighborhoods are less likely to desist from disruptive behavior than girls in non-disadvantaged neighborhoods, similar to the adverse effect found for boys who grow up in these settings (e.g. Leventhal & Brooks-Gunn, 2000; Sampson & Groves, 1989). Like boys, girls living in disadvantaged neighborhoods compared to those in advantaged neighborhoods tend to be exposed to a higher number of risk factors, including family dysfunction, which, in turn, exacerbates the development of disruptive behavior. The effect of growing up in a low SES neighborhood (as defined by census data) on girls’ disruptive behavior, furthermore, remained after taking into account socio-demographic and family factors and was evident across the entire period of ages 7 to 12.

Multiple Domains and/or Factors: Multivariate results

In the explanation of girls’ disruptive behavior it is important to consider multiple risk and/or protective factors simultaneously to also take into account synergistic and cumulative effects. The combination or accumulation of risk factors within different domains appears more informative than the examination of a single risk factor. For instance, examining individual characteristics and contextual factors simultaneously, the empirical study in chapter 2 found no evidence that the link between contextual risk factors (harsh punishment, low parental warmth, deviant peer affiliation, neighborhood risk) and
disruptive behavior was stronger in girls without significant CU features compared to girls with high levels of CU features. In contrast, a low level of parental warmth was associated with a chronically high level of disruptive behavior primarily for girls with elevated CU features. It may be that girls who are high on CU features are particularly in need of a warm and close relationship with their primary caregiver in order to develop an internalized sense of morality and to adopt prosocial behaviors. Consequently, a parent-child relationship that is cold and unloving may be particularly detrimental to the behavioral functioning of girls with high levels of CU features. This finding is in agreement with longitudinal studies on moral emotions (e.g. empathy, guilt) that have suggested that children with low levels of anxiety may be at risk for developing CU features (e.g. Kochanska, 1995; Rothbart, Ahadi, & Hershey, 1994; Young, Fox, & Zahn-Waxler, 1999), particularly if they are not exposed to a warm and involved parenting environment (Kochanska, 1997). The synergistic negative effect of a mismatch between parenting style and child disposition in our study, however, seemed to disappear over time, supporting the notion that the younger the age of the girl, the greater the influence of parental behaviors.

In addition, findings indicated the potential presence of mediating variables. Parental behaviors such as harsh punishment and parental stress that are more prevalent in disadvantaged neighborhoods compared to non-disadvantaged neighborhoods, for instance, may be an important mediating factor in explaining neighborhood effects on girls' disruptive behavior.

In conclusion, the findings in this thesis provide us with improved knowledge about developmental processes regarding girls' disruptive behavior. This knowledge is important since the implementation of interventions should be buttressed by empirical evidence. In addition, the findings also show the importance of examining dynamic, interactional processes within and between different domains of risk factors as evidence was found for the presence of both moderating and mediating effects. Studies on boys have shown that no single risk factor but rather an accumulation of multiple risk factors (in different domains) is associated with the development of disruptive and delinquent behavior (e.g. Stouthamer-Loeber et al., 2002; Yoshikawa, 1994). This appears to be true for girls as well as boys. The present findings also stress the importance of developmental research as in several cases, effects changed or disappeared over time. Lastly, the findings also underscore the benefit of using a within-individual modeling approach. This approach for example clarified that the positive association between neighborhood risk and disruptive behavior did not mean that
girls in disadvantaged neighborhoods showed an escalation in their disruptive behaviors over time, but that fewer girls in disadvantaged neighborhood outgrew their disruptive behavior compared to girls in non-disadvantaged neighborhoods.

7.1.3 Objective 3: A gender-sensitive model for girls’ disruptive behavior

Figure 7.1 depicts the model used in this thesis showing the nesting of explanatory factors (based on Bronfenbrenner’s 1979 model; Loeber, Slot & Stouthamer-Loeber, 2008). The inner circle represents the girls’ individual characteristics (e.g. age, race, callous-unemotional features). The next circle represents (proximal) family related factors, such as household composition, welfare status, and parental behaviors (e.g. harsh punishment, low parental warmth, positive parenting). The outer circle represents the distal factor neighborhood residence (e.g. low SES versus non-disadvantaged neighborhoods, crime rates in the neighborhood). Other circles included represent school and peer related risk and protective factors.

Figure 7.1 – Explanatory model utilized in the present thesis
Figure 7.2 shows the evidence found for explanatory factors of girls’ disruptive behavior. The figure summarizes the key findings of the current thesis and highlights areas for further research in order to better inform prevention and treatment programs.

Our findings showed that individual characteristics such as callous-unemotional features and girls’ orientation and sensitivity towards interpersonal relationships need to be considered when explaining girls’ disruptive behavior. As expected, at this young age the girl is mostly affected by family factors (Winslow & Shaw, 2007). Family factors of particular importance in explaining girls’ disruptive behavior are the presence or absence of the typical parental socialization of girls, low parental warmth (for disruptive behavior) and harsh punishment (for relational aggression). The review of family-linked risk and protective processes in chapter 4 pointed out reciprocal associations between girls’ individual characteristics and family factors (shown by two-sided arrows in Figures 7.1 and 7.2). We found some evidence for a delayed effect of deviant peer affiliation on girls’ relational aggression, but not for symptoms of disruptive behavior. This partial support is shown by a dotted arrow in Figure 7.2. The studies presented in this thesis furthermore showed direct effects of neighborhood residence on girls’ disruptive behavior as well as on

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**Figure 7.2** – Heuristic, explanatory model of girls’ disruptive behavior
parental behavior, which in turn, may influence girls' behavior.

A comparison of Figure 7.1 with Figure 7.2 shows that the findings from the literature reviews and empirical studies fit the proposed heuristic model well. The current model, however, can be improved further by a more close examination of direct and indirect effects of girls' affiliations with peers and introducing school related risk and protective factors as other explanatory factors of girls' disruptive behavior. The model may also be expanded by consideration of different outcomes such as ODD/CD symptoms, relational aggression and perhaps others such as violence, given that the present findings showed differential prediction by parenting context.

In conclusion, the model can be considered as an advanced model over Bronfenbrenner's model (1979) because it shows more differentiation by, for example, considering multiple outcomes (relational aggression, ODD/CD symptoms) and including moderating effects. For instance, our findings on the association between CU, low parental warmth and the development of disruptive behavior showed evidence for a moderating effect. However, the model needs further improvement as empirical studies on explanatory factors of girls' disruptive behavior accumulate.

7.2 Limitations of the present studies

Several limitations of the empirical studies presented in this dissertation need to be considered when interpreting the results. First, the studies examined mean trajectories of disruptive behavior and relational aggression and did not focus on different trajectories that may exist for subgroups of girls, who in turn, could have different outcomes. Future studies should focus on teasing apart these different trajectories and could, for instance, examine whether different explanatory factors play a role for the subgroup of girls that shows high levels of disruptive behavior at an early age.

Furthermore, the trajectories studied in this thesis were based on teacher reports of girls' disruptive behavior. Because the developmental trajectories spanned from age 7 to 12 and self-reports of problem behavior are deemed reliable from age 10 onwards, we were not able to use girls' self-reports. While the use of teacher reports eliminated the influence of shared informant effects on disruptive behavior, the trajectories in this thesis may be influenced by teacher reporting bias as teachers have been found to report higher rates of disruptive behavior than parents (Hipwell et al., 2002; Keiley, Bates, Dodge & Pettit, 2000; Offord, Boyle & Racine, 1989). Moreover, low agreement between different informants
regarding overt and covert problem behavior is the rule rather than the exception. Potential explanations for these discrepancies include informant bias, differences in the meaning of the behaviors measured in each context and/or the instability of girls' behavior across settings (Hipwell et al., 2002) and are subject to further study. Covert behaviors, such as relational aggression, are in themselves more difficult to detect by parents and teachers. Peer nomination techniques could not be used in the present studies although it has been suggested that peers are better informants than teachers, for instance on relational aggression, as they are often the victims (Crick et al., 1999; Leff et al., 1999), although this introduces its own set of biases. Ideally, an observational component of parental behavior would have also been included. Self-report measures of parenting are typically only modestly correlated with measures based on direct observation (Holden & Edwards, 1989), and the two assessment approaches can yield disparate findings (Rothbaum & Weisz, 1994). Taken together, findings from the present studies should therefore be replicated using different informants.

In addition, the trajectories in this thesis spanned from girls' ages 7 to 12. Developmental studies following girls into adolescence would, for example, help to elucidate whether the relative influence of peers and parents shifts over time.

Also, while longitudinal studies can examine the temporal ordering of relationships between variables necessary for causal inference, this methodology is not sufficient for making firm causal interpretations as the observed relations may be better accounted for by some unobserved “third” variable. For example, genetic and neurocognitive factors have been implicated in the development of disruptive behavior (Moffitt, 2005; Moffitt et al., 2001).

A limitation pertaining to the literature reviews is that we did not conduct meta-analyses. This is an important gap that needs to be addressed in the future.

Last, a word of caution should be given regarding the generalizability of the findings, which is limited by the use of an all-female sample within inner-city Pittsburgh, Pennsylvania, United States. Owing to the differences between the United States and the Netherlands in the social and political climate, organization of mental health services, availability of different treatments, and characteristics of minority populations, generalization to the Dutch situation is complicated. Therefore, Dutch studies are needed to replicate these findings.
7.3 Directions for future research

Future studies should focus on examining multiple risk and protective factors from multiple domains simultaneously. To date, no empirical studies have simultaneously examined prospective associations between family and peer factors and girls’ disruptive behavior. Attention should be particularly paid to interactive associations; risk factors are likely to cluster (e.g. girls growing up in unloving homes may affiliate with deviant peers, punitive parents may live in disadvantaged neighborhoods) or trigger other risk factors over time (e.g. school failure may trigger unsupervised wandering in the neighborhood). Simultaneously taking into account protective and risk factors is another important goal. Risk and protective factors may, for example, interact in a way that the presence of protective factors may buffer the effects of risk factors (Stouthamer-Loeber et al., 2002). Specific attention should also be paid to mediators and moderators. Questions that remain unanswered, for example, are: Does peer influence mediate neighborhood effects on girls’ disruptive behavior? And, which parenting behaviors mediate neighborhood effects?

Future studies should furthermore focus on disentangling the differential development of disruptive behavior in subgroups of girls. For example, are the same risk factors important in early and late onset of girls’ disruptive behavior? And, do differences exist in neighborhood effects in early versus late onset of disruptive behavior in girls?

Last, although the literature reviews in this thesis addressed gender differences, the empirical papers did not due to the use of an all-female sample. In order to examine gender differences in explanatory factors of disruptive behavior future studies will need large mixed-gender samples, including large groups of girls (because of a lower prevalence rate of disruptive behavior).

7.4 Clinical implications

Assessment

The present findings show that assessments of girls should be improved to counter under-identification and underestimation of disruptive girls. Frequently used assessment tools, such as the Child Behavior Check List (CBCL, Achenbach, 1991) as well as the diagnostic criteria in the Diagnostic and Statistical Manual of Mental Disorders (DSM, American Psychiatric Association, 1994) should for example include callous-unemotional features, as has been suggested by Moffitt and colleagues (2008), because CU features are associated with chronically high levels of ODD/CD over time in girls as has been
shown in boys, and thus may delineate a severe and persistent form of conduct problems in youth. Assessment tools and diagnostic criteria should also include ‘female-sensitive’ symptoms such as relational aggression, as has been suggested by multiple scholars (e.g. Bjorkqvist, Lagerspetz & Kaukiainen, 1992; Crick & Grotpeter, 1995; Galen & Underwood, 1997; Xie, Cairns & Cairns, 2002), to do justice to the differential phenotype of disruptive behavior in girls compared to boys. The options for diagnostic practice will be to create separate disorders for the two genders (i.e. to assign different criteria to the diagnosis of, for instance, conduct disorder for boys and girls), or to create subtypes of conduct disorder that are correlated with gender.

**Prevention**

The present findings may help to improve the detection of girls who are at elevated risk for developing / escalating disruptive behavior. Due to their different phenotype many girls who show disruptive behavior go undetected and are therefore not targeted by prevention workers. This stresses the need for gender-oriented prevention.

Increasing awareness that girls who grow up in unloving homes are at risk for disruptive behavior and all the negative outcomes associated with that (such as mental health problems, school drop out, teenage pregnancy) points out the girls (and families) that should be specifically targeted by prevention efforts. A noteworthy multi-level prevention program focusing on parenting and family support, which has been specifically developed as a population level-strategy and a public health approach to promote children’s well-being currently available and proven effective is *Triple P* (Positive Parenting Program; Sanders et al., 2005).

Another group that should be targeted by prevention efforts, based on the present findings, are children residing in disadvantaged neighborhoods. Communities That Care (CTC), for instance, is an operating system that provides research-based tools to help communities mobilize to promote the positive development of children and youth and to prevent adolescent problem behaviors that impede positive development including substance abuse, delinquency, teen pregnancy, school dropout, and violence. Results from a 7-state experimental trial involving 24 communities showed that within 4 years of adopting the CTC system, community coalitions reduced the incidence and prevalence of delinquent behaviors and of alcohol, and tobacco use among young people community wide (Hawkins et al., 2008).
**Intervention**

Research shows that a large group of girls with disruptive behavior does not receive help or not in a timely manner (see review by Hipwell & Loeber, 2006). Studies have shown that early adolescence appeared to be a crucial period for the development of disruptive behavior in girls. As a result, prevention and intervention programs should ideally start or intensify just before the girl’s transition from childhood to adolescence. Studies presented in this thesis also showed that in girls aged 7 to 12 parents are the primary target and tool in interventions for girls who exhibit disruptive behavior. Since family functioning is clearly important in the development of disruptive behavior in girls, and findings suggest that this relationship is reciprocal (e.g. Hipwell et al., 2007; Huh, Tristan, Wade & Stice, 2006; Laird, Pettit, Bates & Dodge, 2003), it is crucial for intervention programs to include parent training programs or systemic therapies. A greater emphasis on building more positive relationships with parents may be a critical component of effective, multi-component interventions for girls. Even if the family is not the only contributor to the development of disruptive behavior in girls, it is certainly the central vehicle by which change can be made to turn development in a more positive direction. Parent Management Training (PMT) indeed appears to be effective for girls at an early stage in development (Hipwell & Loeber, 2006).

Regarding interventions in middle childhood and adolescence, the majority of programs has not been designed specifically to reflect the qualities of girls’ disruptive behavior. Two notable exceptions exist; the EarlsCourt Girls Connection program (Pepler, Walsh & Levene, 2004; Walsh, Pepler & Levene, 2002) and the Multi-dimensional Treatment Foster Care program (MTFC; Leve, Chamberlain & Reid, 2005), which specifically focus on reducing relational aggression, and managing interpersonal relationships. Evaluation studies of these programs showed beneficial outcomes for girls on dimensions of externalizing problems, delinquency and social relations (Hipwell & Loeber, 2006). A word of caution, however, is warranted because most treatment evaluations do not report on the extent to which girls’ behavior is brought into the non-clinical range (Hipwell & Loeber, 2006). Thus, it may be that girls still demonstrate clinically significant disruptive behavior despite improvements following the intervention.

In addition, since our findings showed that neighborhood SES affects disruptive behavior over and above the effect of family factors, we need to tailor intervention efforts to the neighborhoods that families reside in. An example of such an intervention is Multisystemic Therapy (MST); an intensive family- and community-based treatment that
addresses the multiple determinants of serious antisocial behavior in juvenile offenders (Henggeler et al., 1998). The multisystemic approach views individuals as being nested within a complex network of interconnected systems that encompass individual, family, and extrafamilial (peer, school, neighborhood) factors. MST, however, has been developed for a specific group of youth (adolescent juvenile offenders with serious antisocial behavior) and aims at reducing a broad range of antisocial behavior and conduct problems without a specific focus on ameliorating relational aggression (Hipwell & Loeber, 2006). In addition, MST has not been evaluated for girls.

In conclusion, a better understanding of explanatory factors of girls' disruptive behavior may provide essential information relevant to developing (better) prevention programs, adjusting parent management training, and optimizing treatment programs for girls. If we could prevent girls from showing disruptive behavior or developing more serious forms of disruptive behavior, both concurrent and future generations will benefit. Early identification and improved interventions will furthermore limit costs of mental health care and the juvenile justice system, from which the society at large will benefit.