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Adolescent aggressive behavior

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CHAPTER 8

General conclusions and discussion

8.1. General conclusion

Looking back at the opening citation of this dissertation, it seems that Friedman's words prove to be true for adolescents. The direct use of force (i.e., aggression) hardly leads to positive outcomes, and is often associated with negative outcomes. As we have seen in Chapter 2 bullies may have benefitted from a higher perceived popularity, but they were also more disliked by their classmates. Moreover, in Chapter 5 physical (or direct) aggression is associated with peer rejection in overaroused girls who are sensitive to rejection and rejected by peers. The findings from Chapter 6 indicate that increases in aggression by one is likely to spread by the fact that adolescents often copy maladjusted behavior from their peers. Finally, Chapter 7 shows that highly aggressive boys ended up in friendships with the least favorable peers and received less affection than their low aggressive counterparts. Combined these findings show that aggressive behavior is often accompanied by negative outcomes in terms of loss of affection, social preference, and friendships. This makes the study of aggression all the more important.

The studies in this dissertation provided support for the notion that aggressive and antisocial behavior may be heavily influenced by heightened intensity of status and stimulation goals (Lindenberg 1996, 2008), especially in certain contexts. In line with the person-environment interaction hypothesis (see Dodge & Pettit, 2003), Chapter 4 and 5 showed that the relationship between physiological factors (e.g., resting heart rate, RSA reactivity) and antisocial behavior is most visible in adverse peer contexts. Moreover, our findings also added more depth to this peer context, by examining whether these dispositions to behaving aggressively precede context or the other way around.

Together, all three parts of this dissertation have given us more insight in the associations of aggression. As we expected from goal-framing and SPF theory, we have seen that aggressive adolescents directly and/or indirectly pursued status and stimulation goals and they also craved affection goals. The downside is that the pursuit of these goals, when they are very intense, often resulted in maladaptive behavior (i.e., aggressive and antisocial behaviors), especially but not exclusively in contexts that legitimize such behavior.

In the following subparagraphs we will shed more light on these findings, their relevance and their implications.

8.2. Status and stimulation in relation to peer context

Status and Stimulation Goals

Together with the insights from the bullying literature, the findings from Chapter 2 show us that intense status needs and aggression can indeed be linked. We thereby get a better perspective on why some children and adolescents behave aggressively. From the findings in Chapter 3 we have seen that stimulation goals are also important with regard to aggressive and rule-breaking behavior. Physiological predispositions can place goals of stimulation on the foreground. Underaroused individuals are in an uncomfortable physiological state and by

seeking more stimulation they can achieve more optimal levels of arousal, resulting in more well-being. Together with the findings from Chapter 4 and 5, Chapter 3 shows that underarousal in rest is associated with various types of antisocial behaviors (i.e., relational and direct aggression, rule breaking, and antisocial behavior), although this differed between boys and girls. In addition, Chapter 4 and 5 provided support for a person-environment interaction (see also Dodge & Pettit, 2003; Scarpa & Raine, 2006) and indicated that physiological predispositions have to be seen in light of (risky) peer contextual factors, such as peer bullying behavior and peer rejection. Interestingly, these chapters also showed that underarousal in both rest and stressful situations is associated with aggression and antisocial behavior. Here too context matters. Certain peer contexts may thus highlight stimulation goals (and possibly also goals of social status and behavioral confirmation) to a greater extent. However, the interaction between dispositions to stimulation goals and context does not necessarily have to result in aggressive or maladjusted behavior. With regard to overaroused individuals (e.g., high stress reactivity) and context it has been suggested that effects may be bi-directional. Both the Differential Susceptibility hypothesis (Belsky, Bakermans-Kranenburg, & Van IJzendoorn, 2007; Belsky & Pluess, 2009) and the Biological Sensitivity to Context hypothesis (Boyce & Ellis, 2005) suggest that heightened biological reactivity may be associated with negative outcomes in adverse circumstances (as Chapter 4 and 5 show), but that the same disposition may be associated with positive outcomes in supportive contexts. Future studies should test whether this hypothesis also holds for underaroused individuals (see paragraph 8.7 for a more detailed discussion).

Context and disposition: what comes first?

Selection and influence

In the third part of the dissertation we were interested in the question whether dispositions to status and stimulation goals precede the peer context or whether these goal dispositions are largely shaped by the peer context. Therefore, in Chapter 6 we studied selection and influence processes with regard to the forms and functions of aggression in a longitudinal social network sample. Analyzing the friendship networks from nine school grades with SIENA (Snijders, 2001; Snijders & Baerveldt, 2003; Snijders, Steglich, & Schweinberger, 2007) added additional insights to our perspective on the development of aggression. When controlling for structural effects of the networks and for selection on the basis of gender similarity, it turned out that proactively and relationally aggressive adolescents selected behaviorally similar peers as friends. Moreover, proactive, reactive, and relational aggression were adopted from friends over time. Friends did not influence each other's behavior with regard to overt forms of aggression.

The results of Chapter 6 show that selection and influence processes can work simultaneously. Adolescents select friends on the basis of proactive and relational aggression and are in turn reinforced by their friends in their aggressive behavior. These findings also

relate to the developmental differences observed in aggression. In adolescence, aggression becomes more subtle (i.e., relational) and can serve to establish and maintain friendships (Heilbron & Prinstein, 2008).

Default selection

Although Chapter 6 provided some support for the idea that goal dispositions both precede and are shaped by peer context, in the final study of this dissertation we look more closely at whether these processes are active choices or not. In Chapter 7 therefore studied friendship selection processes on the basis of direct physical aggression. Although it is often assumed in the aggression literature that friendships sprout from active selection on the basis of behavioral similarity (homophilic selection), it may in fact be that aggressive adolescents affiliate with each other on the basis of default selection. Although aggressive adolescents would prefer supportive, non-aggressive friends, due to their own aggressive behavior they have to resort to less favorable peers in order to get at least some affection. Our findings supported this idea of default selection. Highly aggressive boys had the same friendship preferences as low aggressive and bi-strategic boys. What they wanted were friends who scored low on aggression and high on emotional support. However, these highly aggressive boys ended up with friends who were also aggressive and provided the least emotional support. In contrast, boys who were less aggressive or who were able to combine pro- and antisocial behavior (i.e., bi-strategic boys) ended up with their preferred friends: i.e., those peers low on aggression and high on support.

The results from Chapter 7 imply that highly aggressive boys are likely to get stuck in a vicious cycle; because they have no other choice than to affiliate with other aggressive boys, their aggressive behavior is reinforced, which in turn decreases the chances of being in a friendship with non-aggressive, prosocial peers.

Together, the chapters in part three present an interesting perspective on goal dispositions to behaving aggressively in relation to peer context. At first glance, the findings from Chapter 6 and 7 seem to contradict each other to some extent. That is, in Chapter 6 we found no support for notion that adolescents selected each other on the basis of overt forms of aggression, whereas in Chapter 7, we found exactly this. Two reasons may account for this difference: (1) in Chapter 7 we focused on a very specific group of overtly aggressive boys (i.e., those high on aggression *and* low on prosocial behavior), (2) in Chapter 7 we were not able to disentangle the form from the functions. Hence, future studies may want to look at the underlying pro- and reactive functions of overt aggression with regard to default selection processes.

8.3 Some scientific implications

The studies in this dissertation have several scientific implications. First, problem behavior does not necessarily indicate deviant goals but rather a higher intensity of goals that

everyone pursues (in this case, status and stimulation). Second, the way intense status and stimulation goals affect adolescent behavior can only be fully understood in light of the peer context individuals are in. This became mostly evident in the studies on physiological underarousal. As we mentioned at the beginning of this dissertation, under- and overarousal can both have negative and positive effects. For example, it is tempting to speculate that in safe environments that are sufficiently monitored, underarousal may lead children to seek out new and stimulating things which are beneficial to their behavioral development. However, in unsupervised, risky environments, the underarousal may lead children to hang out with 'bad peers' and sensation seeking may result in aggressive and antisocial behavior.

Related to this point is the important finding that "soft" social goals such as affection are not pushed aside by "hard" social goals such as domination (coupled with aggression). It only seems that highly aggressive boys seek each other out as friends, but in fact they do not. They retain their need for affection and thus prefer affectionate friends like everyone. Here too, the peer context matters because highly aggressive boys have to make due with what they can get. Thus, when studying friendship selection processes, it is important to consider that adolescents cannot always choose who they want as friends. As with rejected adolescents (Deptula & Cohen, 2003), overtly aggressive boys sometimes have to resort to second choices and may end up befriending the least favorable peers.

Finally, as we saw in Chapter 5, an intense need for behavioral confirmation (i.e., a need for being accepted) can express itself as a high sensitivity for being rejected. We found that for girls who are highly sensitive to being rejected, it is not the need for stimulation that creates behavioral problems, but just the opposite: it is the intense sensitivity to being stimulated that creates problems. In this case, the need for stimulation is too quickly satisfied and can lead to aggressive reactions when one feels rejected. Social and physical needs can thus interact to create behavioral problems.

8.4 Societal implications

The findings in this dissertation can also be helpful for policy makers. Although there are intervention and prevention studies on aggression in abundance, effect sizes of these studies are typically low to moderate (see e.g., McGuire, 2008; Wilson & Lipsey, 2007). Better insight in the associations between physiological factors and aggression may facilitate the identification of early risk factors of problem behaviors. More specifically, biomarkers such as low resting heart rate and blunted responses to stress may help to identify potential problematic youth at an early age. Thus, getting better insight in the effects of physiological predispositions may create more effective and perhaps more specific interventions. For example, in Chapter 5 we have seen that both under- and overaroused girls were at risk for aggression. Currently, most programs would subject these aggressive girls to a single intervention without taking the heterogeneity of aggression into account (Rutter, 2008). However, it is likely that the group of underaroused girls will benefit more from an intervention aimed at increasing cognitive skills,

whereas the group of overaroused girls may benefit more from anger management and social skills training.

A second recommendation for intervention and prevention practices comes from integrating our findings on physiological predispositions and peer context in relation to aggression and antisocial behavior. First of all, our findings showed that interventions and preventions should target groups as well as individuals at risk. Namely, we found that physiological dispositions to behaving aggressively / antisocially become especially evident in adverse environments. Classroom norms may influence the opportunities for sensation seeking for youth with low resting heart rate. As the findings from Chapter 4 indicated, only in classrooms where bullying behaviors were frequent, was low resting heart rate associated with antisocial behaviors. Interventions should thus aim at decreasing all sorts of negative behaviors in classrooms, because the interaction of dispositions with contexts makes antisocial behavior spread from one kind of behavior to another.

In addition, special attention should be directed to overaroused girls who are in adverse peer contexts (in our case highly rejected and sensitive to peer rejection; see Chapter 5). These girls were extremely aggressive compared to underaroused and normally aroused girls. This extreme behavior is likely a result of poor social functioning and therefore social skills and anger management training may lead to better social adjustment. Clearly, more research is needed to identify the precise mechanisms that give rise to the relationship between overarousal, social stress, and aggressive behaviors. By examining the direction of the relationship between peer rejection and (physical forms of) aggression, we may be able to determine which comes first; do girls who are rejected become aggressive as a desperate response to achieve their goals to some extent or are girls rejected as a result of their aggressive behavior? Most likely, these two processes occur simultaneously and reinforce each other.

Next to the potential importance of physiological factors in intervention and prevention programs, peer relations also deserve close attention because they exert considerable influence on the development of aggression. Perhaps most important for policy makers and school teachers is the main finding from Chapter 7. Here we found that highly aggressive boys befriended other aggressive boys, but in reality they longed for friendships characterized by prosocial support. Providing these boys with the tools to engage in prosocial, healthy friendships may be accompanied by a reduction in aggression. Some empirical evidence showed that teaming up aggressive boys with non-aggressive boys already led to reductions in aggression over time (Hektner, et al., 2003). Improving social skills of aggressive boys may facilitate this process in a more natural fashion.

8.5 Directions for future research

There are several issues that cry out for more future research. First, with regard to physiologic under- and overarousal, it is important to assess whether such predispositions are stable traits or whether they change over time. And, related to this, whether the association

between physiological predispositions and aggression is stable over time. The TRAILS data used in Chapter 3 and 4 already showed that this association increases in strength over time in boys. However, it would be important to see if this association is also visible in adulthood and if these physiological predispositions are also related to different (antisocial) outcomes in adulthood.

Second, it is important to get more insight into the role underaroused children and adolescents play in the peer group. Are the youth who are characterized by a low resting heart rate at the center of the group, due to their tendency to seek out risky activities? In line with Moffitt's (1993) dual taxonomy, low heart rate youth may be overrepresented among the life-course persistent antisocial children. As such, they may become a role model for adolescence-limited antisocial youth and thus be at the core of peer groups in adolescence. Another, related question is, why would youth with low resting heart rate be so easily influenced by the bullying behavior around them? One possibility may be that status and/ or stimulation goals are highlighted in such contexts, giving an extra impetus to goal-pursuit in the form of various forms of antisocial behavior.

Third, as we already mentioned, future studies may want to test the hypothesis of a differential biological susceptibility to contexts (e.g., Boyce & Ellis, 2005). Here, the assumption rests on the idea that biological disposition may have a bidirectional effect; certain dispositions are associated with negative outcomes in adverse contexts, whereas the same dispositions may be associated with positive outcomes in supportive contexts. Although this hypothesis was posited with regard to stress reactivity, we may extend this to autonomic underarousal during baseline (i.e., during rest) as well. That is, in contexts characterized by aggressive and antisocial behavior, underaroused (and thus under-stimulated) adolescents may be more inclined to affiliate with deviant peers. In turn, this may lead to more aggressive and antisocial behavior. However, in contexts characterized by support, underarousal may be associated with positive outcomes, as a result of partaking in risky prosocial activities. There is also some evidence for this hypothesized direction. Although underarousal is often associated with negative outcomes, low heart rate levels and reactivity have also been reported in men with risky professions (e.g., in British paratroopers: McMillan & Rachman, 1987).

Fourth, building further upon the results from Chapter 6, future studies may want to shed light on the change in forms and functions of aggression throughout child and adolescent development. One particular question is whether functions maintain certain forms of aggression. Can different types of aggression grow into other manifestations of aggression? Whereas the instrumental function of aggression may give rise to more direct forms of aggression in childhood, the same function may lead to more indirect forms in adolescence. Longitudinal social network analysis may prove to be a useful tool to answer such questions.

Fifth, most of our findings showed that processes work quite differently for boys and girls. In Chapter 7 we focused specifically on boys, because there were hardly any girls in our (large) sample who were high on overt aggression and low on prosocial behavior. This suggests that at least with regard to overt forms of aggression, there are differences in frequency and severity between boys and girls. In addition, the relationship between heart rate in rest and

aggression and antisocial behaviors became especially apparent in boys. Although we found some cross-sectional evidence of this relationship in girls at age 11 (see Chapter 4), over time this relationship only held in boys. This suggests several ventures for future research. First, it may be that low resting heart rate in girls is associated with different forms of (mal)adjustment. Some studies show indeed that low resting heart rate is associated with more internalizing instead of externalizing problems (see e.g., Dietrich et al., 2007; Oldehinkel et al., 2008). Second, it may also be that girls with low heart rate engage more in risky prosocial behavior (Murray-Close & Woods, 2009).

Another direction for future research focuses on an extension of the default selection hypothesis (see Chapter 7). Unfortunately, in our test of this hypothesis only cross-sectional data was available and therefore more support for this hypothesis is needed. Future studies should thus seek to replicate this finding with longitudinal data. Moreover, it may be worthwhile to test a *selection – de-selection – socialization* model. That is, we would expect that friendships with aggressive youth dissolve more often than friendships with non-aggressive youth. This in turn may lead to default selection (i.e., aggressive youth affiliate with each other because friendships with non-aggressive youth have been dissolved), which in turn results in social influence leading to more severe forms of aggressive behavior.

In sum, although the studies included in this dissertation provided answers to several questions with regard to the role that peer contexts and physiological dispositions play in the explanation of aggression and antisocial behavior, they also give rise to many other questions that deserve attention in future research. In addition, the field of aggression and antisocial behavior should give more priority to possible intervention and prevention studies that are aimed at changing group norms, teaming up aggressive with non-aggressive children and providing sufficient tools (e.g., social skills training) to socially maladjusted youth.