

6.006 words excl. references

The Development of Aggressive Behavior in Childhood and Adolescence: A Social Interactionist Perspective

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Introduction

The propensity to engage in aggressive behavior shows a high stability across the lifespan, comparable in magnitude to the stability of intelligence (Olweus, 1979). Defined as behavior intended to cause harm to others, aggression is a form of antisocial behavior that entails a host of negative consequences at the individual, interpersonal, intergroup, and society level (Krahé, 2013). Therefore, understanding how aggression develops from childhood to early adulthood is a task of paramount importance, not only from a scientific but also from a societal point of view. This chapter presents findings from an extensive program of research with children, adolescents, and young adults in Germany that seeks to identify risk factors for the development and persistence of aggressive behavior.

Using longitudinal, multilevel and experimental designs and relying on multiple measures of aggressive behavior, the research presented in this chapter addresses three main questions: (1) What are *intrapersonal risk factors* for the development and persistence of aggressive behavior from middle childhood to adolescence? This part will discuss the role of deficits in anger regulation, theory of mind, and executive function for the development of aggressive behavior. (2) What factors in the *social environment* contribute to the development of aggressive behavior? Here, the focus will be on social rejection by nonaggressive peers and affiliation with aggressive peers, the impact of being surrounded by aggressive peers in the classroom, and exposure to violent role models in the media. (3) How do individual *dispositions and environmental risk factors interact* to explain developmental trajectories of

aggressive behavior? This part will show how exposure to risk factors of aggressive behavior in the social environment affect individuals differently, defining the boundary conditions within which individual differences in aggression may be magnified or reduced. The chapter concludes with discussing the implications of the findings for efforts to prevent and reduce aggressive behavior in the critical periods of childhood and adolescence.

Development of aggression from an interactionist perspective

Like any social behavior, aggressive behavior is shaped by both individual dispositions and environmental influences. The interactive effects between those two sources of variability explain why not all individuals behave in the same fashion in a particular social context and why the same individual may be more likely to show aggressive behavior in certain contexts than in others. Current theories of aggression, such as the General Aggression Model (Anderson & Bushman, 2018), conceptualize the development of an aggressive personality as the result of the interplay of biological and environmental modifiers, and a broad research literature has offered evidence on the critical variables on either side, for instance genetic dispositions on the one hand and exposure to violence in the family on the other. As reflected in transactional models of development, individuals are not only shaped by their social environment but also impact that environment through their personal dispositions (Sameroff, 2009).

Socio-cognitive models of the development of aggression in childhood and adolescence reflect this mutual dependency of personality and environmental influences (Huesmann, 2017). For example, Huesmann's (1998) script theory proposes that individuals develop mental representations about when and how to act aggressively based on their social experiences on the one hand and their habitual modes of information processing and emotion regulation on the other. Similarly, Dodge's (2011) social information processing (SIP) model conceptualizes aggressive behavior as the outcome of a sequence of perceiving and interpreting social stimuli on the basis of characteristic styles of information processing.

According to both models, the resulting level of aggressive behavior elicits negative social reactions that may lead to further aggressive behavior, resulting in a downward spiral of the chronification of aggression.

In the following sections, we first present longitudinal evidence on the role of intrapersonal risk factors for the development of aggressive behavior, focusing on both cognitive and affective variables. This analysis is followed by a discussion of environmental risk factors, in particular peer rejection, the level of aggression in the peer environment, and exposure to violence in the media, again using longitudinal designs. After considering these “main effects”, person-environment interactions are demonstrated by studies using multilevel analysis.

Intrapersonal risk factors for the development and persistence of aggressive behavior

Individual differences in aggressive behavior emerge in childhood as soon as children are able to form an intention to harm, which is the defining feature of aggression. An intention to harm presupposes a level of cognitive development at which children are able to anticipate that their actions will lead to harm for another person (Krahé, 2013). In the search for variables predicting a higher disposition to engage in aggressive behavior in childhood and adolescence, both cognitive and affective variables have been identified. In our longitudinal program of research, we examined deficits in executive function and theory of mind as cognitive risk factors for aggression and maladaptive anger regulation as a risk factor in the domain of affect regulation. These factors were studied in a large sample of children aged between six and eight years at the beginning of the study, who were followed over a period of three years.

Deficits in executive function and theory of mind

Executive function (EF) is a cognitive activity that governs goal-directed action and planning of behavior, and allows for adaptive responses to novel, complex, or ambiguous situations. It is important for self-regulation, including anger regulation, and comprises three

main components: Inhibition, working memory updating, shifting, and planning (Karr et al., 2018). Previous studies have shown that lower executive function is related to antisocial behavior (Ogilvie, Stewart, Chan, & Shum, 2011). As a set of cognitive skills allowing people to exert self-control in challenging situations, it is unsurprising that good executive function may help to reduce aggression. However, few studies have examined the link between childhood executive function and aggression over time. Similarly, the relationships between executive function, specific types of aggression and other contributing factors, such as how easily someone becomes angry, are not well understood.

In a three-wave longitudinal study, we investigated the relationship between childhood executive function and different types of aggression to test the prediction that deficits in executive function would predict aggressive behavior in later years (Rohlf, Holl, Kirsch, Krahe, & Elsner, 2018). Primary school children aged between 6 and 11 years old were assessed at the start of the study, and at two subsequent data waves approximately 1 and 3 years later. To assess differences in executive function, including memory, planning abilities, and self-restraint, the children completed written tests, and to measure aggression, their teachers recorded their aggressive behavior, distinguishing between different forms and functions. Forms included physical aggression, such as hitting or kicking, or relational aggression, such as damaging others' social relationship by excluding them or spreading false information about them. In addition, the study also distinguished between two functions that may motivate aggressive behavior: reactive aggression, that is the child's tendency to react aggressively to provocation, and proactive aggression, the child's tendency to behave aggressively in "cold blood" without being angered or provoked. Finally, parents reported how often and how easily their child tended to get angry. Using structural-equation modeling, we investigated the reciprocal relations between EF and teacher-rated aggression, while controlling for earlier levels of EF. To be able to separate change at the individual level from

stable between-person differences, we used a Random-Intercept Cross-Lagged Panel Model (RI-CLPM) as proposed by Hamaker, Kuiper, and Grasman (2015).

The findings supported the predicted path from deficits in EF to aggressive behavior over time: the lower children scored on the measure of EF at the start of the study, the higher their aggression was rated by their teachers 1 and 3 years later, controlling for initial levels of aggressive behavior. This was true for both physical and relational forms of aggression. We also found that an increased tendency to get angry in children with lower EF may partly explain their increased aggression over time. With regard to the different functions of aggressive behavior, deficits in EF were related to increased reactive aggression over time, but did not predict proactive aggression. This ties in with the idea of proactive aggression as ‘cold-blooded’, planned aggression for which affect control is less critical than for reactive aggression, which is more strongly based on anger and therefore may be more strongly affected by deficits in EF (Rathert, Fite, Gaertner, & Vitulano, 2011).

A second basic ability relevant for understanding the development of aggressive behavior is *Theory of Mind (ToM)*, which is a mental representation of the internal states of other people. It is conceptually related to EF and typically differentiated into two facets: Making inferences regarding others’ beliefs, intentions, or desires, refers to *cognitive ToM*, and inferring others’ emotions refers to *affective ToM* (Derksen, Hunsche, Giroux, Connolly, & Bernstein, 2018). Numerous studies have examined the relation between ToM and aggressive behavior in children (see Wellman, Cross, & Watson, 2001, for a meta-analysis and critique). However, the evidence is limited in several ways: Many studies have yielded mixed results, were limited to children of preschool age, used cross-sectional designs, or did not control for earlier levels of aggressive behavior.

To address some of these limitations, we used the same sample of elementary school children to conduct a three-wave analysis of the reciprocal relations of ToM with aggressive behavior (Holl, Kirsch, Rohlf, Krahé, & Elsner, 2018). Again, both forms (physical and

relational) and functions (proactive and reactive) of aggression were included in the analysis. Using structural-equation modeling, we investigated the relations between a latent factor of ToM, composed of both cognitive and affective ToM, and aggressive behavior. To be able to separate change at the individual level from stable between-person differences, we again employed a Random-Intercept Cross-Lagged Panel model to identify intraindividual trajectories of change in aggressive behavior in relation to deficits in ToM.

Consistent with our theoretical assumption, we found that lower ToM prospectively predicted higher physical and relational aggression as rated by the children's class teachers. This was true for the paths from T1 to T2 as well as from T2 to T3. Even though we did not examine mediating processes in our study, these results are in line with the predictions derived from the SIP model (Dodge, 2011) that deficits in ToM may lead to biased or deficient SIP, which in turn may lead to more aggressive behavior.

Anger and maladaptive anger regulation

In the final set of analyses based on the sample of elementary school children, we examined the role of *maladaptive anger regulation* as a risk factor for the development of aggression. Because children of that age are not yet able to provide valid self-reports of their anger regulation and anger expression strategies (Parker et al., 2001), the study by Rohlf, Busching, and Krahe (2017) examined the prospective links between maladaptive anger regulation and aggressive behavior in middle childhood over a ten-month period, using an observational measure to assess anger regulation *in situ*. The anger induction measure consisted in asking the children to build a tower of bricks that was manipulated so as to keep collapsing, and their reactions were coded. The same children were studied again another two years later using an age-adapted version of the tower-building task. Children's behavioral strategies for regulating their anger were observed, distinguishing between maladaptive (e.g., venting the anger, verbal and visual focus on the frustrating stimulus) and adaptive (solution orientation) behavioral strategies (Kirsch, Busching, Rohlf, & Krahe, 2019; Rohlf & Krahe,

2015). Maladaptive anger regulation was correlated with teacher ratings obtained 10 months later of how frequently the child had shown physical and relational aggression in the past six months and to what degree the aggressive behavior was reactive, that is shown in response to a provocation (Rohlf et al., 2017). Extending the longitudinal analysis to a total of three years, the path from maladaptive anger regulation to teacher-rated aggressive behavior was still significant (Kirsch et al., 2019). By then, children were old enough to provide reliable and valid self-reports of aggressive behavior, and these reports also correlated significantly with maladaptive anger regulation observed three years earlier. Moreover, maladaptive anger regulation was a significant prospective predictor of problems with peers (assessed through self-, parent-, and teacher ratings).

In combination, the findings presented in this section show that individual differences in executive function, theory of mind, and anger regulation predict individual differences in aggressive behavior over time in the developmental period of middle childhood. The next section takes a closer look at the role of environmental risk factors in the development of aggression.

Risk factors in the social environment

A host of environmental factors affect the extent to which children and adolescents acquire patterns of aggressive behavior and shape individual differences in the tendency to respond aggressively in specific situations. These include proximal factors, such as experiencing and witnessing aggression in their family, and more distal factors, such as high ambient temperatures (see Krahe, 2013, for an overview). In our program of research, we focused on two sources of environmental influences that are relevant for understanding the development and persistence of individual differences in aggression: peer relations and exposure to violence in the media.

Peer relations and the development of aggression

Children and adolescents who are unable to regulate their anger in a socially accepted way and show aggressive behavior are likely to encounter problems with their peers and experience social rejection (Godleski, Kamper, Ostrov, Hart, & Blakely-McClure, 2015) or victimization (e.g., Rosen, Milich, & Harris, 2012)). Due to the marginalization by nonaggressive peers, aggressive children tend to affiliate with other aggressive, forming social groups in which aggressive behavior is normative (Patterson, DeBaryshe, & Ramsey, 1989).
peers

In line with this reasoning, Rohlf et al., 2017 proposed that problems in relationships with peers would be both a consequence of deficits in anger regulation and a predictor of aggression. With regard to the frequency of aggression, they proposed that maladaptive anger regulation at T1 would predict higher levels of aggression at T2 via more peer problems at T1, which in turn would lead to a higher frequency of aggressive behavior at T2. They further predicted that maladaptive anger regulation would be indirectly linked to both proactive and reactive of aggression through the influence of peer problems at T1. As expected, the frequency of aggression, as well as reactive and proactive aggression at T2 were indirectly predicted by T1 maladaptive anger regulation through T1 peer problems. Thus, the more maladaptive anger regulation children showed, the more peer problems they experienced later, and the more socially rejected they were at T1, the higher their scores on the measures of the frequency and functions of aggression at T2.

Jung, Krahe, Bondü, Esser, and Wyschkon (2018) studied the link between antisocial behavior, social rejection, academic failure, and affiliation with deviant peers from a sample of 6- to 15-year old participants who were studied at three measurement waves (T1 to T3) over a time period of about five years. Teacher ratings were used as indicators of participants' antisocial behavior, academic failure, social rejection, and affiliation with deviant peers. In addition, parents provided ratings of antisocial behavior and social rejection. Consistent with

their predictions and in line with previous research (Laird, Jordan, Dodge, Pettit, & Bates, 2001; Ostrov, Murray-Close, Godleski, & Hart, 2013), higher antisocial behavior at T1 predicted higher peer rejection at T2, controlling for the stability of social rejection between T1 and T2. T2 social rejection was a positive predictor of affiliation with deviant peers at T2, and T2 social rejection indirectly predicted T3 antisocial behavior through a stronger affiliation with deviant peers. The direct effect from T2 social rejection to T3 antisocial behavior was non-significant, indicating that affiliation with deviant peers is, indeed, a crucial process underlying the pathway from social rejection to antisocial behavior.

In addition to the responses peer groups show to the aggressive behavior of individuals, a social interactionist perspective on the development of aggression also needs to look at the responses of individuals to the aggressive peer group behavior to which they are exposed. A fruitful line of thinking to conceptualize the effect of aggressive peer groups on the individual is captured by the metaphor of aggression as a “*contagious disease*” (Huesmann, 2017). Just as people’s immune system is affected by the germs they catch from others and that make them ill as a result, initially nonaggressive individuals may become infected with the aggressive behavior patterns of the peers around them.

Whereas past research on the peer contagion of aggression focused on either self-selected peer groups or on groups with a high level of aggression (see Jung, Busching, & Krahe, 2019), for a review), our research analyzed the contagious nature of aggression in groups where self-selection is minimized, namely classroom communities. Because students are assigned to their classes by the school administration, studying the contagion of aggression in classroom communities is particularly suitable for disentangling the socializing influence of peers from the selective affiliation with peers with similar levels of aggression. In a sample of approximately 1,300 male and female students in middle childhood, Rohlf, Krahe, and Busching (2016) investigated the effect of classroom aggression on both physical and relational aggression. They found that the higher the level of both physical and relational

aggressive behavior in their class, the more aggressive individual class member were 10 months later, even after controlling for the temporal stability of aggression as well as participants' gender and age.

Similar results were found in studies with adolescents that investigated the contagion of peer aggression in the broader context of antisocial behaviors, such as delinquency, vandalism, or substance abuse, which often co-occur with aggressive behavior. In a large multilevel study with almost 17,000 male and female adolescents distributed across approximately 1,300 classrooms, Busching and Krahe (2018) observed a significant main effect of class-level antisocial behavior on individual antisocial behavior across a one-year period. Again, the effect remained significant after controlling for the stability of individual antisocial behavior and relevant third variables, such as migration background, school track, academic performance, gender, and age. In another study, Busching and Krahe (2015) found that both physical and relational aggression at the class level significantly predicted future aggression at the class level across four measurement points, which indicates that peer contagion not only operates at the individual but also at the group level. In the case of relational aggression, the autoregressive path coefficients were significantly higher at the class level than at the individual level, indicating that the level of relational aggression is more stable in the class communities as a whole than in the individuals of whom they are formed.

In summary, this body of evidence suggests that being surrounded by aggressive peers increases children and adolescents' risk of becoming more aggressive over time. Furthermore, recent findings support the idea that the contagious effect of aggression not only spreads within systems but also permeates other, interconnected ecosystems: Individuals who are surrounded by aggressive friends are at risk of introducing aggression into other spheres of their life and affecting individuals that had no direct contact with the original source of the aggressive behavior (Greitemeyer, 2018). The studies considering antisocial behavior suggest

that concept of peer contagion is not limited to aggression but operates in a similar way across different kinds of problem behavior, including vandalism or substance abuse.

Exposure to violence in the media

Content analyses have shown the strong presence of violence in movies, video games, books, and song lyrics (Dill, Gentile, Richter, & Dill, 2005; Herd, 2009; Potts & Belden, 2009; Shor, 2018). A large research literature has documented a link between exposure to violent media contents (see meta-analyses by Anderson et al., 2010; Greitemeyer & Mügge, 2014; Prescott, Sargent, & Hull, 2018). Findings from experimental studies, demonstrating short-term effects of a single exposure to violent content, and longitudinal studies, identifying habitual use of violent media as a predictor of aggressive behavior over time, support the conclusion that exposure to violence in the media has a causal impact on the development of aggressive behavior. Although the magnitude of the effects is on the small side, its size is comparable to other known risk factors for aggression.

In our program of research on violent media effects, we demonstrated the long-term effects of habitual use of violent media in adolescence (Krahé, 2014). Controlling for a number of other potential risk factor of aggression, we demonstrated a significant path from habitual use of media violence to aggression to aggressive behavior over a period of up to three years (Krahé & Busching, 2015; Krahé, Busching, & Möller, 2012; Möller & Krahé, 2009). Using latent class analysis, we identified three trajectories of media violence over four data waves separated by one-year intervals: consistently low users, consistently higher users, and “desisters”, that is adolescents starting off with a high level of media use that declines over time. Using membership in these groups to predict trajectories of aggressive behavior during the same period revealed a high similarity between both trajectories: low media violence users remained consistently low and high media users consistently high on aggressive behavior, whereas a decrease in media violence among the desisters was accompanied by a parallel decrease in aggression (Krahé et al., 2012).

Importantly, nonviolent media use was unrelated to aggressive behavior, which is consistent with an explanation based on observational learning, postulating that the effects are specific to the observation of violent behavioral models. In addition, we conducted a combined experimental-longitudinal study to show that when exposure to violence in the media was reduced through a systematic intervention, aggressive behavior also declined over time (Krahé & Busching, 2015; Möller, Krahé, Busching, & Krause, 2012). These findings are also consistent with the hypothesis of a causal influence of media violence in the development of aggressive behavior.

In addition to the role of observational learning from media models that engage in violent behavior, we identified further mediating processes by which violent media contents may impact aggressive behavior. One such process is the acquisition of normative beliefs that justify aggressive behavior (Möller & Krahé, 2009). The more violent video game use adolescents reported at the first data wave, the more physical aggression they showed 30 months later, and the path was mediated by a higher acceptance of aggressive behavior as normative and appropriate. These findings show that being exposed to violence in the media or engaging in violent behavior in the virtual reality of a video game contributes to the development of aggressive scripts that are then used in guiding behavior in the real world.

A second mediating process is emotional desensitization, which works at the affective level and means that individuals who are used to media violence show less subjective and physiological arousal in response to graphic depictions of violence. In an experiment studying responses to violent film clips in young adults, we showed that greater habitual use of violent media predicted stronger positive and weaker negative affective responses to violent clips and also reduced physiological arousal as measured by skin conductance levels (Krahé et al., 2011). Furthermore, the use of violent media contributes to the development of aggression by increasing the accessibility of aggressive thoughts. The more time research participants spent on using violent media, the shorter their response latency in recognizing aggressive (but not

nonaggressive) words (Busching & Krahe, 2013). In the same study, we showed that participants who had engaged in violent video game play in a ship context also showed shorter response latencies to ship-related words, whereas participants who had engaged in violent video game play in a city environment showed shorter response times in recognizing city-related words. This pattern indicates that initially neutral stimuli are imbued with aggressive meaning if they are presented in association with violent cues, consistent with a conceptualization of aggressive behavior as resulting from an associative network of aggressive affect and cognition (Berkowitz, 2008).

In summary, the research reviewed in this section has shown that exposure to violence in the virtual reality of the media contributes to the development of aggression and identified several interlocking psychological mechanisms by which this process may be explained.

Interaction of intrapersonal and social risk factors

Personal characteristics and social environment shape the development of aggression not only as main effects but also in interaction. In our program of research, we looked specifically at the interaction between individual-level and class-level variables in relation to peer norms and aggressive behavior. This enabled us to address the question whether the same class environment differentially affects the development of individual aggression depending on the individual's pre-existing level of aggressive behavior.

Multilevel modelling offers a statistical approach for addressing the question of whether exposure to an aggressive peer environment has the same effect on all individuals or varies in relation to the level of aggression the individuals bring to the environment. In our program of research, we could take advantage of the fact that in the German school system, students remain in the same class community for several years, creating a stable class environment. This enabled us not only to quantify the main effects of classroom level of aggression on the developmental trajectories of aggressive behavior for the individual class members but also to test possible cross-level interactions. These reflect the extent to which

classrooms with a high overall level of aggression affect students differently depending on their individual level of aggression. In a series of analyses with elementary and secondary school students, we showed that aggressive classroom environments have a greater impact on initially nonaggressive children than on those with higher levels at the start of the analysis (Jung et al., 2019).

In their sample of children of elementary school age, Rohlf et al. (2016) found a significant cross-level interaction between individuals' relational aggression and the level of relational aggression among the remaining members of the class. Individuals who showed low initial levels of relational aggression scored significantly higher on measures of relational aggression 10 months later if they were in classrooms with a high level of relational aggression. By contrast, individuals with initially high levels of relational aggression were unaffected by the level of relational aggression in their classroom, which means that they remained at a high level even in classes in which the overall level of aggression was low. Similarly, Busching and Krahe (2018) analyzed cross-level interactions between individual and classroom antisocial behavior in an adolescent sample. In line with their hypotheses, initially non-antisocial participants showed more antisocial behavior one year later the higher the level of classroom antisocial behavior had been in their class at the beginning of the study. By contrast, participants with initially high levels of antisocial behavior were largely unaffected by their peers' level of antisocial behavior. In a further study, we showed that not just the collective behavior in a class but also the collective normative belief that aggression is acceptable contributes to the development of aggressive behavior in individual class members by increasing the acceptance of aggression at the individual level (Busching & Krahe, 2015).

Consistent with the metaphor of aggression as a contagious disease, this finding indicates that being part of an aggressive environment "infects" initially "healthy" class members, whose aggression levels move towards the class level over the course of time, whereas it has little effect on those who have already "caught" the aggressive behavior.

However, a similar cross-level interaction could not be observed for physical aggression in the Rohlf et al (2016) study. For this form of aggression, only a classroom-level main effect was found, indicating that aggressive classrooms promoted aggressive behavior in class members regardless of their individual levels of aggression.

In addition to the contagious effect of peers' aggressive behavior, we also examined the impact of peers' normative beliefs about aggression, defined as subjective beliefs about the appropriateness and acceptance of aggressive behavior in different kinds of social situations, on individuals' aggressive behavior. For example, in the aforementioned study by Busching and Krahe (2015), a significant cross-level interaction between class-level normative beliefs and individual physical aggression was observed. Individuals with low levels of aggressive behavior at the start of the study showed more physical aggression twelve months later if they had been in a class with a high tolerance of aggression than if they had been surrounded by classmates with a low tolerance of aggression. By contrast, individuals with initially high levels of physical aggression were more aggressive 10 months later regardless of their peers' tolerance of physical aggression.

It was noted earlier that aggressive children and children with maladaptive anger regulation are at risk of being socially rejected by their peers. By looking at cross-level interactions in the path from aggression to social rejection over time, we were able to show that aggressive students become less socially rejected over time if they are in a class with a high collective level of aggression (Rohlf et al., 2017). No effect of class level on social rejection of initially nonaggressive students was found. This finding suggests that aggressive behavior becomes normalized in aggressive classrooms, changing the normative and social context in the direction of making aggressive behavior more acceptable. As a result, aggressive children meet with less social rejection.

In addition to the proximal factor of exposure to aggressive peers, we found that the more distal factor of exposure to aggressive behavior in the media has a similar effect.

Adolescents with an initially low level of aggressive behavior showed a stronger increase in the normative acceptance of aggression the more they used violent media, whereas little influence of media violence use was apparent for the initially more aggressive participants (Krahé & Busching, 2015).

In the reported studies, we also examined the role of gender differences as a possible moderator of class-level effects and cross-level interactions. Although significant moderator effects of gender were identified, the results did not yield a consistent pattern. In the younger sample studied by Rohlf et al. (2016), class members were more affected by the collective levels of relational aggression of their same-sex than their opposite-sex peers. In their adolescent sample, Busching and Krahé (2015) found that the aggression level of girls in a class had a greater impact on both male and female class members than the aggression levels of boys in predicting increases in aggressive behavior over a period of three years. More research examining cross-level interactions broken down by gender are needed to explain these findings.

Implications for prevention and intervention

Gaining a better understanding of the risk factors for aggressive behavior in the individual and the social context is a precondition for developing promising intervention strategies. The findings from our program of research have several implications for intervention efforts. For example, the results by Rohlf et al. (2018) suggest that training programs that help children to regulate their anger in a more socially acceptable way could reduce their aggression. A meta-analysis of anger management trainings directed at school-aged children showed that such programs can be successful in reducing anger and aggressive behavior, although the effect sizes across 60 studies were moderate in size (-.33 for anger and -.34 for aggressive behavior; Candelaria, Fedewa, & Ahn, 2012). Based on the Social Information Processing model, a program designed to reduce the normative acceptance of aggression also reported positive results (Dodge & Godwin, 2013). Reviewing a broader

range of intervention approaches, Hendriks, Bartels, Colins, and Finkenauer (2018) concluded that intervention effects are larger among children with higher starting levels of aggressive behavior. However, our findings consistently showed that the initially less aggressive individuals are more negatively affected by a high level of aggression in their class, which speaks against focusing intervention efforts on the more aggressive individuals. Instead, the aim should be to prevent them from catching aggressive behavior from their peers, by focusing on changing classroom norms and behaviors and bolstering the “immune system” of nonaggressive peers so that they are better able to reject aggressive norms and behaviors in the class around them.

Based on our findings on the impact of violent media use on aggressive cognitions and behaviors, we specifically targeted adolescents’ use of violent media in an effort to reduce aggressive behavior and the normative acceptance of aggression as a critical antecedent. We conducted a combined experimental-longitudinal study in which they randomly assigned adolescents to an intervention group designed to reduce media violence use or a non-treated control group and followed the effects of the intervention on reducing media violence use, the normative acceptance of aggression, and aggressive behavior over a period of 30 months (Krahé & Busching, 2015). After the six-week intervention implemented in a school context, participants in the intervention group reported significantly less use of violent media than did participants in the control group, and the difference remained stable over the next 24 months. Reduced media violence use prospectively predicted lower normative acceptance of aggression and less self-reported physical aggression behavior up to 18 months post-intervention. While it is not ethically feasible to experimentally increase the dosage of violent media contents in an experimental design, using an intervention to reduce the use of violent media is a viable strategy, not only for breaking the cycle from media violence to aggression but also to rigorously test causal hypotheses about long-term effects of violent media use on aggressive behavior.

Summary and conclusions

The program of research presented in this chapter was designed to identify risk factors for the development of aggressive behavior in childhood and adolescents based on a social-interactionist perspective on the mutual dependency of personal and environmental factors in shaping social behavior. Using a multi-method approach that comprised experimental, longitudinal, and multilevel studies, our research yielded the following conclusions:

First, looking at main effects of intrapersonal risk factors for aggression, we showed that deficits in executive function (EF) and theory of mind (ToM) as well as maladaptive anger regulation predicted increases in aggressive behavior over time. Mediation analyses suggest both intrapersonal and social pathways in this developmental process: Deficits in EF predicted aggression via maladaptive anger regulation, and maladaptive anger regulation predicted aggression via social rejection.

Second, we examined social environmental risk factors and showed that social rejection by nonaggressive peers and ensuing affiliation with deviant peers was linked to increases in aggressive behavior over time. Moreover, we found that deviant peer groups contribute to the development of aggression via the normative acceptance of aggression. Habitual exposure to violence in the media was another risk factor linked to the social context that led to increases in aggression over time.

Third, developmental trajectories of individual differences in aggression were shown to be moderated by social influences in the peer group: being surrounded by aggressive peers increases aggressive behavior over time. This is true especially for individuals with initially low levels of aggression, consistent with the metaphor of aggression as a contagious disease. By studying the impact of aggressive peer group behavior in classroom communities to which individuals are assigned by the school administration, this contagion effect could be identified largely uncontaminated by self-selection effects.

The findings provide a starting point for theory-based efforts to intervene in the transactional process of personal and environmental influences. For example, at the personal level, programs are needed to promote anger regulation with the aim to break the path from maladaptive anger regulation via social rejection to aggressive behavior. The existing literature shows that such approaches may yield at least moderate success. At the level of the social environment, interventions to reduce media violence use may have sustained effects on reducing the normative acceptance of aggression as well as aggressive behavior. Finally, identifying individual differences in the susceptibility to risk factors for aggression in the social environment alerts researchers and practitioners to the contagious effect of aggressive peer groups especially among those individuals who enter such environments with a low level of aggressive behavior and highlights the need to closely monitor class-level norms and behavior patterns. Given the negative effects of aggressive behavior on healthy development in childhood and adolescence in a broad range of domains as well as the social costs involved for society, recognizing the interaction between individual and environmental risk factors for aggressive behavior and designing appropriate intervention tools remains a task of paramount importance for psychological research.

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