Aggression and Victimization

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Abstract

This essay details the historical progression of theories attempting to explain human aggression and victimization across the lifespan. Different theoretical lenses allowed for a comprehensive examination of the nuances between aggression and victimization, as supported by landmark experimental research studies conducted in the social and behavioral sciences. In addition, the neurobiology of aggression was discussed as an area of future research where professionals from multiple fields could collaborate in order to better understand the intersection of biology and the environment and how it impacts the development of individuals.

Human history is replete with chronicles of wars and interpersonal aggression. Much of the news we read describe aggressive actions toward individuals or groups of people, within and between political and religious factions, and among countries around the globe. In this essay, we provide an overview of what we know about this ubiquitous human behavior.

First, we define important terms. *Aggression* refers to deliberate acts that inflict harm; *victimization* is the experience of receiving unwanted aggressive acts. *Physical* aggression (use of physical force toward another, such as hitting and kicking) is a form of *direct aggression*, as is *verbal* aggression (name-calling, malicious teasing). More recently, *relational* (indirect) aggression (Crick, 1995) has been identified as a distinct form of aggression in which the target's social relationships or status are attacked (e.g., social exclusion, rumor spreading). There is debate about whether *cyber*-aggression is a separate form of aggression or a method for delivery of aggressive actions (see Bauman, Cross, & Walker, 2013, for discussion of this issue). Aggression can also be categorized by the motive behind the action: *proactive* aggression includes *hostile* aggression, in which the desire to harm the target drives the behavior, and *instrumental* aggression, which refers to acts calculated to bring valued resources to the aggressor, whereas *reactive* aggression is provoked by an actual or anticipated aggressive attack and is enacted in self-defense or retaliation (Hartup, 2005). Researchers sometimes distinguish between *trait* aggression, which is a characteristic of a person across time and settings such that the person is more prone to commit acts of aggression than others, and *state* aggression, which refers to a momentary experience of aggression in a particular situation or context.

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METHODS USED IN THE STUDY OF AGGRESSION

At the outset, it is important to understand the methods used in aggression research (Bushman & Anderson, 1998). Much of the research has utilized laboratory experiments. For example, the *aggression machine* is used with confederates who behave as directed by the researchers. One experiment involves a learning task in which the research participant is the teacher and the confederate is the "student." The participant is instructed to punish the student for mistakes by administering an electric shock; aggression is measured by the strength and duration of the shock. Other experiments use varied aversive stimuli (loud sound blasts, heat pulses) as the punishment. Despite the differences in experimental designs, the studies appear to tap the same underlying construct (Bushman & Anderson, 1998).

The question is whether aggression, as measured in these carefully controlled laboratory studies, is relevant for understanding aggression in a real-world context. Intuitively, there are great differences between pushing a button on a machine to administer a shock in an experiment and assaulting or killing another person. Furthermore, subjects in many aggression experiments were college students who comprise a relatively homogeneous group in terms of age and other demographics. To determine whether laboratory studies are relevant to real-world events, Bushman and Anderson (1998) compared results of lab studies and data obtained outside the lab (from questionnaires, observations, or public records) and concluded that findings are similar, although the magnitude of differences varies.

The potential for aggression is a trait humans share with all animal species (Miczek, 2001). Twin studies have made a strong case for the heritability of aggression, which is estimated to be about 50% (McAndrew, 2009). It is not, however, sufficient to say that aggression is "in our genes," because there is wide variation across individuals in the degree to which they behave aggressively, and 50% of the variation is explained by other factors.

THEORIES OF AGGRESSION

Although not specifically a theory of aggression, we begin with Bronfenbrenner's ecological systems theory (Bronfenbrenner, 1979) because it emphasizes the importance of looking beyond the individual for critical influences on aggression. Espelage and Swearer (2011) applied this theory to bullying and encouraged researchers and practitioners to consider all levels of the ecological system in their studies and interventions.

Ecology is the study of the interactions between organisms and their environment. Bronfenfrenner's adaptation focused on the human organism; he emphasized that the individual must be considered in context, which he depicted as multiple layers of influence. At the center of the overlapping

layers is the individual and his or her unique characteristics, experiences, and genetic code. Looking outward, the next layer, the *microsystem*, contains interactions in interpersonal roles (e.g., family, school, peers), which are contained within the *mesosystem*. The mesosystem is composed of interactions among the various microsystems. The next layer, the *exosystem*, includes the broader influences of mass media, neighbors, community services, as well as the laws and the economy. Finally, the *macrosystem* contains the attitudes, beliefs, and values of the culture, which influence all the inner layers (Rosa & Tudge, 2013). Aggression and victimization occurs at all levels of the ecological system.

The first major theoretical approach to aggression is *the frustration-aggression hypothesis* (Dollard, Doob, Miller, Mowrer, & Sears, 1939). This theory proposed that aggression is always the result of frustration, defined as interference with a goal response. The effect of interference depends on the strength of the drive that was frustrated, the degree of interference, and the number of frustrations experienced in attempts to reach the goal. Dollard *et al*. acknowledged that every frustration does not lead to an aggressive outburst because frustrated individuals will inhibit the expression if they believe that it will ultimately harm them or that they are unable to actually enact the aggression. When the frustrated individual inhibits the aggression, and the frustration continues, the likelihood of aggression eventually taking place is increased. Dollard *et al*. also found that the closer the person is to achieve the goal, the more likely they will respond aggressively to frustration. For example, when a research confederate cut in front of people waiting in line, people responded more aggressively when they were closer to the front of the line. Finally, if the frustrated person is unable to take aggressive action (e.g., for fear of the ultimate consequences to self or lack of physical strength), the person may displace the aggression onto substitute targets.

Konrad Lorenz (1966) melded Darwin's theory of natural selection with Freudian notions of aggression as an instinctive behavior (*thanatos*). Lorenz' theory is based on his observations of aggression in animal species. He postulated that aggression balances the geographical distribution of the species, supports the survival of the strongest members via natural selection, and protects the young in species, such as humans, in which the young require time to develop. Lorenz proposed that along with aggression, there are mechanisms that inhibit aggression, so that it does not reach levels beyond what is necessary for species survival. Empathy for the target is one such mechanism, but with the invention of devices that kill at a distance (guns, bombs, etc.), that mechanism has fewer opportunities to work. He also suggested that rituals develop to express aggression in a symbolic manner, as in competitive sports that represent fights with rivals.

Berkowitz (1989) proposed a variation of the frustration-aggression hypothesis. He was critical of the notion that frustration was the sole source of aggressive behavior. He believed this might be true for hostile aggression (where the object is to inflict harm), but not for instrumental aggression, where the goal is to obtain a resource such as money, territory, or status. Berkowtiz proposed that in addition to frustration, social rules, prior learning, aversive experiences (heat, pain, etc.), individual differences, and the strength of cognitions about the goal have an impact on whether aggression occurs. He stressed that frustration was influential only to the degree that it produced negative emotions and that the frustrated person's attributions, or beliefs about the cause of the frustration, affect the emotions.

In recent years, *social cognitive theory* has dominated thinking and research about aggression. Perhaps the best-known tenet of that theory is that aggression is a learned behavior that can be developed by witnessing aggression. This line of inquiry led to concerns about aggression in media, and so on, and how it might influence the behavior of children. This is consistent with Bronfenbrenner's emphasis on the importance of the environment. The most influential social cognitive research was that of Bandura (1965; Bandura, Ross, & Ross, 1961). In his experiments with young children, one group watched an adult behave aggressively toward an inflated bo-bo doll and another observed an adult behaving nonaggressively, both for a 10-min duration. A third group served as a control. Then the children were taken to an experimental room with many toys including those used by the model in the aggressive condition. The child spent 20 min in the playroom while being observed, and both physically and verbally aggressive behaviors were coded. The subjects who observed the aggressive model imitated that behavior significantly more often than the children in two other groups. The experiment (and others in the series) showed that witnessing aggressive behavior increased the probability of behaving aggressively. Bandura *et al*. later conducted similar experiments with children who watched films of aggression, with an additional variable: one group witnessed the model being rewarded for his behavior, another viewed him being punished, and one group saw no consequences to the behavior. The children were left alone in a playroom and observed for 10 min. The children that had seen the model punished produced significantly fewer spontaneous imitative behaviors than those who had seen him rewarded or with no consequence. However, when the children were offered rewards to imitate the behavior, there was no longer any difference between the groups. This suggests that children can learn from observation and that they understand the role of reinforcement.

This series of experiments, and the resulting wide acceptance of social cognitive theory as an explanation for aggression, has not been without critics.

The artificial nature of the experimental context means that one cannot conclude that these children would behave aggressively in another "real-life" setting. Further, the target of the aggression was not another person but an inflatable toy that bounced back when hit; the activity may have been perceived as a game rather than an act of hurting someone else. No physiological measures were taken. This popular theory also does not take into account the individual differences in aggressive behavior (traits). Subsequent research based on this line of work used college student subjects and reported very small effect sizes (Ferguson & Dyck, 2012).

Evolutionary psychology offers a theory to explain both the presence of aggressive behavior and the variation in its expression across individuals (Buss & Duntley, 2013). An underlying assumption is that all living things have a single basic goal—to ensure the survival of their species and their own genetic code. In evolutionary theory, aggression is seen as an essential survival tool. However, Dagg and Harding (2012) disagreed and pointed out that humans differ in nontrivial ways from many of the primate species whose behavior has been studied to inform thinking about human aggression. These scholars noted that when early *Homo sapiens* first appeared on the planet, they lived harmoniously in small groups and did so for about four million years. As the species evolved and brain size increased, the size of groups also increased, setting the stage for potential conflict over resources. However, these early humans adapted to population increases by moving to less crowded areas, disbursing from Africa to all areas of the globe. This strategy worked until about 20,000 years ago, when the population increase led to a critical point in competition for resources. It is then that archeological evidence of intraspecies aggression appears (Dagg & Harding, 2012).

Evolutionary psychology proposes that aggression evolved as a solution to problems that humans faced in adapting to the circumstances of their existence, keeping in mind the goal of species survival. In order to survive and procreate, humans need to acquire resources such as territory (to hunt or grow food), water, tools, and sexual partners. When resources are limited, humans compete to obtain them; aggression is a manifestation of that competition. Aggression may also be way to preempt anticipated aggression from others.

One of the most critical resources necessary for species survival is access to sexual partners, who are needed for reproduction. Aggression can be used to damage rivals for the most desirable partners, thereby increasing one's chances for success in mating. Aggression can be verbal or relational; the goal is to reduce the status of the rival. In some social groups, particularly among adolescents, aggressive behavior may confer high status or dominance. Such status gives the aggressor power to acquire more resources and may be of

particular relevance when the social hierarchy is fluid (such as at school transitions, at which time bullying tends to increase). Because sexual partners are such a valuable resource for ensuring the survival of the individual's genetic code, some individuals use aggression as a means to discourage infidelity (e.g., threatening harm to one's partner if she should be unfaithful). Sexual aggression is also a means to obtain access to members of the opposite sex who are not willing partners. From this standpoint, aggression is a useful tool to ensure survival of the species and genetic code.

Buss and Duntley (2013) pointed out that the value of aggression is specific to the particular context. For example, in some cultures and subcultures, the aggressor attains admiration (and high status) from this behavior, while in others, such behavior would reduce one's status, defeating the purpose of the aggression. In schools with high rates of bullying, it is often the case that the bully is a high status, dominant individual who is feared by others, and is quite successful at garnering resources. In other schools, the climate is such that aggression is frowned upon, so the elevation of status would not occur. Individuals must weigh the potential benefits of aggression against the cost (current and future) of such actions. For example, they must determine whether retaliation is likely and whether they want to continue the competition.

Evolutionary theory also sheds light on why males are generally more physically aggressive than females. First, given the goal of reproducing, males need access to females (whose job is to give birth and care for the offspring). Although women are limited in their capacity to reproduce by the 9-month pregnancy period, males can ensure the survival of their genetic code by fathering more offspring. This leads to competition for fertile female partners, with the rivals being other males. Thus, we see high rates of male-on-male aggression. For women, their best chance to reproduce is to attract the males who can provide the best resources; using verbal and relational aggression to diminish the status of their rivals makes sense in this context. It also explains why much female-to-female aggression targets the rival's appearance and social status.

THEORIES OF VICTIMIZATION

While theories of aggressive behavior are well known, less attention has been paid to theoretical formulations of victimization. Two related theories, known as *lifestyle exposure* and *routine activities,* posit that context is the critical factor in elevating risk (Finkelhor & Asdigian, 1996). Those who reside in neighborhoods, or who associate with aggression-prone groups, are more likely to be victimized. Four factors increase the risk of being victimized: proximity to crime, exposure to crime, target attractiveness, and

guardianship. *Guardianship* refers to the absence of oversight and supervision (from parents, police, etc.) that would serve to diminish aggressive behavior. This is consistent with studies showing that school bullying takes place in unsupervised areas of the school, and certainly applies to the largely unmonitored cyber-environment. Although these theories have merits, they also overlook many of the realities of modern life, and neglect individual characteristics that may contribute to increased risk of victimization. Finkelhor and Asdigian focused on individual characteristics of persons vulnerable to victimization. They suggest that *target congruence*, ways in which characteristics of the target match the "needs, motives, or reactivities of offenders" (p. 6), is important. Some characteristics increase risk because they suggest that the target is unable to stop the victimization, such as small size, emotional vulnerability, and social isolation. Other potential victims are at increased risk because they possess resources that the perpetrator seeks. It is not unusual to read of children who are attacked by peers to obtain money, coveted footwear, or electronics. Some individuals are vulnerable because they incite some perpetrators out of jealousy or anger. High-status athletes are often targeted in cyberspace, perhaps because others are jealous of the attention and access to resources they appear to have. Characteristics such as being LGBT, having a disability, and being hyperactive can also increase risk (Finkelhor & Asdigian). These researchers tested their model and found that target congruence was a good predictor of victimization among youth.

AREAS OF CUTTING-EDGE WORK

Neurophysiological Evidence

Two decades ago, prominent researchers dismissed the notion that biological factors were linked to aggression (Björkqvist, 1994). The theories discussed earlier were developed primarily before neuroimaging and other advanced techniques were available to examine physiological correlates of aggression. It is in fields other than the behavioral sciences that the most novel research is currently being conducted. Researchers have informed us about the neurological and biochemical influences on aggressive behavior, which in general are similar to those found in other animals. These researchers are interested in what drives excessive or pathological aggression in order to develop interventions to reduce this problem behavior (Nelson & Trainor, 2007).

An informative line of research has examined the links between abuse and neglect in early childhood and later aggression (Lee & Hoaken, 2007). Although such a link has been widely acknowledged, the mechanisms by which this occurs have not been identified. A review of relevant literature

suggested that maltreatment impacts basic cognitive development in childhood, while also affecting the development of essential brain regions, such as the prefrontal cortex. As the prefrontal cortex plays a role in inhibiting impulses, it is implicated as an important structure for understanding aggression. Because the development of the cortex continues until young adulthood, it is possible that the timing and duration of the maltreatment would affect these structures differently.

Similarly, fMRI (functional magnetic resonance imaging) techniques allowed researchers to examine brain regions affected by social exclusion, which is very salient for adolescents (Masten *et al*., 2009). Researchers used a computer game in which the participants were first included and then excluded. Subjects believed the other players were peers, but the inclusion/exclusion behaviors were programmed into the computer. The findings were similar to those in previous studies of rejection in adults; specific regions of the brain were activated during periods of self-reported distress and corresponded to times when they were excluded in the game. Some areas of the brain were associated with greater or lesser distress in adolescents, contrary to previous findings in adults. Those participants who had higher rejection sensitivity and interpersonal competence (on parent and self-report measures) showed evidence of greater regulation in the brain. This study provided evidence of the link between neural activity and emotional states during peer rejection.

A recent and informative study that examined aggression in married couples (Bushman, DeWall, Pond, & Hanus, 2014) examined the role of glucose levels on aggressive impulses and behavior in married couples. The participants, 102 heterosexual couples who had been married for an average of 12 years, recorded their glucose levels each morning and evening for 21 days. Each evening, they also inserted from 0 to 51 pins in a voodoo doll representing their spouse based on how angry they felt toward their spouse at that moment. At the end of the 21 days, they competed against their spouse in 25 trials of a game (that was rigged by the experimenter) and administered a loud, aversive noise to their spouse when the partner lost. The measure of aggression was the level of intensity and duration of the noise. Results indicated that average evening glucose levels predicted aggression; participants with lower levels of glucose were less aggressive toward their spouses and those who inserted more pins in the voodoo dolls were more aggressive toward their spouse. The researchers concluded that those with lower evening glucose levels had more aggressive impulses (pins) that led to more aggressive behavior (inflicting loud noise on spouse). They hypothesize that the energy (fueled by glucose) needed to suppress aggressive impulses is depleted by the end of the day, so low levels of glucose were insufficient to disinhibit the aggressive impulses.

Although there is clear evidence that higher levels of testosterone are associated with high levels of aggression in animals, that association is not as evident in humans (McAndrew, 2009). In humans, corresponding increases in testosterone and aggression are found mostly when there is a threat to the status of a male or when there are clues that competition with other males is imminent. One example is the increased levels of testosterone in athletes, which appears to vary by whether they win or lose their competition. Experimental findings have demonstrated that testosterone increases when there are environmental cues that there is a need to compete. In one experiment, participants handled either a mousetrap or a gun; those who handled the gun had increased levels of testosterone and put more hot sauce into the beverage they believed would be drunk by their opponent (McAndrew). Using real-world data, researchers also find that the highest rates of male-on-male aggression occur in adolescence and early adulthood—a period of time when levels of testosterone are highest. McAndrew concluded, after a thorough review of research on testosterone and aggression, that, in humans, testosterone likely facilitates aggressive behavior; levels increase when a male is publicly challenged or about to compete with another male. Situational factors, such as heat, crowding, and noise, will influence the response via the elevation of testosterone.

Patrick (2008) recognized several approaches to the study of the neurobiology of aggression. One such approach is twin studies, which quantify the extent to which genetics influences aggressive behavior. More focused research in molecular genetics seeks to identify specific genes or gene sequences that predispose someone to aggressive behavior and to identify the brain structures and processes that are affected by these combinations of genes. A second approach is what Patrick calls *marker* studies, which identifies biological differences between aggressive and nonaggressive individuals. A wide variety of physiological measures are used, with the goal of determining which brain structures or regions may be indicators of vulnerability to excessive aggression. Another approach focuses on understanding how someone processes stimuli and events that might lead to aggression. These studies examine cognitive and neurological systems under conditions when aggression might be likely using tools such as PET (positive emission tomography), fMRI, and EEG/ERP (electroencephalography/cognitive event-related potential).

Important results from such studies include consistent findings that a low resting heart rate (and sometimes low skin conductance), along with higher reactivity to a stressful or threatening stimulus, is linked to elevated aggressive behavior in children (Patrick, 2008). Findings are less clear-cut in adults, but there is evidence that a similar relationship exists wherein there is greater reactivity (heart rate, skin conductance) in the presence

of interpersonal stressors in aggressive persons (Patrick, 2008). It may be that the low resting arousal enables more instrumental aggression by flattening the typical emotional responses during aggression, whereas the increased arousal when interpersonal stressors are present may account for the elevated reactive aggression (Nelson & Trainor, 2007).

Studies using EEG and ERP (event related potential—the point during EEG that shows response to a specific stimulus) found that certain patterns (low P300 amplitude, which is a measure of a person's reaction to the stimulus in ERP) are found in persons who display impulsive aggression (Patrick, 2008). PET and other imaging studies suggest that there may be differences in certain areas of the brain (frontal cortex, temporal lobe, and anterior cingulate) that are associated with aggression, but to date, *how* these structures affect the cognitive and affective processes involved in aggression is unknown. It has been established that damage to the frontal cortex results in increases in aggression (Nelson & Trainor, 2007). The frontal cortex inhibits impulses that originate in the hypothalamus and amygdala that foster aggressive behavior, and if it is damaged, that inhibitory function may be compromised.

In addition to the importance of the prefrontal cortex in inhibiting aggression, research on "biological signaling molecules" (Nelson & Trainor, 2007, p. 539) has implicated a number of molecules in the aggression process. It is beyond the scope of this essay to itemize the specific studies; we summarize conclusions instead. *5-HT* refers to serotonin receptors in the brain and when these are activated, aggressive behavior is reduced. This suggests that some SSRIs (antidepressant medication) could reduce aggressive impulses. Dopamine has been found in animal studies to reduce instrumental aggression, but side effects make increasing dopamine in humans an untenable treatment. GABA, which reduces arousal and thereby may reduce aggression, is affected by various benzodiazepines (sedatives), generally by reducing aggressiveness. However, in a small group of patients, both high and low doses of benzodiazepines resulted in increased aggression. Nelson and Trainor (2007) speculate that the effect of the drug may vary depending on prior experiences and genetic factors.

Noradreneline is often present when individuals are in stressful situations. The contribution of this substance to aggression has been observed in mice, but its role in humans is speculative at this point. MAOA (monoamine oxidase A) is an enzyme that can reduce aggression; in a particular Dutch family that has a mutation on an MAOA gene (resulting in lower levels of this substance), increased impulsive aggression has been reported in several males in the family.

Current research has yet to discover how these structures and processes differ between proactive and reactive aggression (Patrick), although Nelson and Trainor (2007) noted that instrumental aggression appears to be controlled by

higher levels of the cerebral cortex and impulsive aggression is connected to lower (hypothalamus and limbic system) structures. This is consistent with our understanding of brain functions but indicates that approaches to change these behaviors might need to be different for the two types.

CONCLUSION

The theoretical foundations and research evidence provides some understanding of aggression and victimization. We believe that an integrated perspective, such as espoused by Bronfenbrenner's ecological view, holds the most promise for advancing the field. It is clear that there are genetic and molecular influences on aggressive behavior and that the interactions of an individual with multiple systems, including technology, cannot be ignored. The availability of advanced neuroimaging and other techniques holds promise for elucidating the biological and neurological mechanisms that are involved in aggression, but it is critical that we move forward in understanding *how* those mechanisms work and how they can be utilized in reducing excessive aggression. We also know little about how these biological entities are affected by victimization experiences. Are these structures or chemical reactions altered by victimization in ways that render the victim more vulnerable to subsequent victimization?

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