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Abstract

For over seven decades social psychological theories advanced understanding of aggressive behavior. The most recent major model – the General Aggression Model (GAM) – integrates prior theories, thereby encompassing the broadest range of aggressive phenomena. GAM is built on research about factors within a person that predispose them to aggression; factors from the environment that trigger aggression; and the underlying biological, neurocognitive, and psychological processes. This article summarizes historical and modern social psychological theories of aggression, key research methodologies and findings, and challenges of studying violence and aggression in society. It concludes by noting areas for future social psychological research of aggression.

Human aggression is a social behavior, and whilst it has been studied from many perspectives, it is theoretical models and empirical research from the field of social psychology that have provided the strongest framework from which to understand it. This article focuses on the contribution of social psychologists to the understanding of human aggression, providing first some key definitions, then major theories (both classic and contemporary) and a brief summary of social psychological approaches to the study of aggressive behavior. An overview of research findings is presented, including those describing factors within a person that increase the likelihood they will aggress, situational cues that can trigger aggression, internal psychological processes that underlie an instance of aggressive behavior, and processes that increase trait aggressiveness. We conclude by suggesting a 'risk factor' framework for understanding societal violence and noting directions for future research.

Definitions and Characteristics of Aggression

Definitions

There are three key issues with defining human aggression. First, it is hard to interpret research findings and theories about aggression without a clear definition. Historically, however, many different definitions have been used. As a result, many studies of aggressive behavior are hard to meaningfully compare. More recently, definitions of aggression among social psychologists have converged around the notion that aggression is any behavior enacted with the intention to harm another person who is motivated to avoid that harm (e.g., Anderson and Bushman, 2002; Bushman and Huesmann, 2010). Such a definition is wide enough to capture the full range of aggressive behaviors, and to make allowance for activities that can 'hurt' a target person but to which the target of the hurt willingly consents (such as undergoing surgery or engaging in sadomasochistic sex).

The second issue is that many laypersons and misinformed professionals use the term aggression interchangeably with related but conceptually distinct phenomena such as anger, hostility and competitiveness. There is no question that in the field of psychology, aggression refers only to a behavior, and not to a mindset or an emotional state. Feelings such as anger, attitudes such as wishing the worst for another, and motivations such as the desire to win or control one's environment may contribute to a person behaving aggressively but are not aggression per se. To study aggression effectively, such factors need to be clearly differentiated from aggression and from each other.

A third definitional issue involves the common practice of using the term 'violence' interchangeably with the term 'aggression.' Treating these as synonymous creates miscommunications and confusion among researchers, public policy-makers, and the general public. Among most social psychologists, violence is a subtype of aggression. More precisely, 'violence' is aggression that is intended to cause harm extreme enough to require medical attention or to cause death. Many social psychologists extend this definition to include causing severe emotional harm. Thus, all violent behavior is aggression, but most aggression is not violence. Note that this definition of violence is not synonymous with 'violent crime,' which is a legal term, not a scientific one.

Types and Characteristics of Aggression

When considering the many ways in which one human can harm another, it is useful to distinguish between different forms of aggression, and between the different functions that aggression can perform. Different forms of aggression include physically harming another (i.e., *physical aggression* such as hitting, biting, kicking, clubbing, stabbing, shooting), hurting another with spoken words (i.e., *verbal aggression* such as yelling, screaming, swearing, name calling), or hurting another's reputation or friendships through what is said to others verbally or digitally (i.e., *relational aggression*). Aggression may also be *direct* (with the victim physically present) or *indirect* (enacted in the absence of the victim; for example, smashing someone's property or spreading rumors about them).

Aggression also differs by function. It may involve a relatively pure intent to punish/hurt the target person, as in

reacting aggressively to provocation (i.e., *reactive, affective, hostile, hot, impulsive*, or *retaliatory* aggression) or it may involve a considered and deliberate plan to harm another to gain a desired outcome (i.e., *instrumental, proactive, planned,* or *cold* aggression). Aggression may be an *automatic* response driven by hard-wired self-protection mechanisms (e.g., fight or flight) or involve a script for aggressive behavior that is so commonly enacted that the response is no longer thought-through. Of course such distinctions can be problematic. What about a person whose rage drives them to carefully plan the death of another? Such instances do not fit any of these traditional categorical or dichotomous distinctions. A viable alternative approach to understanding the function of aggression is to locate aggressive acts on three dimensions – the degree to which the goal is to harm the victim versus benefit the perpetrator; the level of hostile or agitated emotion that is present; and the degree to which the aggressive act was thought-through (Anderson and Huesmann, 2003).

Social Psychological Theories of Aggression

Theories Outside Social Psychology

This article is focused on the social psychology of aggression, but must be considered as complementing research from other spheres of psychology. Most notably, biological psychology provides many relevant findings, including links to genetic predispositions, hormones, malformation, or damage of brain structures and levels of cortical and nervous system arousal. Psychodynamic approaches and animal psychology have emphasized aggressive drives, and evolutionary- and animal psychology have focused on aggression in terms of factors related to reproductive success and survival (e.g., dominance and resource-holding potential). Social psychological approaches have tended to include such biological, genetic and personality factors as 'person' factors in their models, but typically have not explored detailed interrelationships among these and related social factors.

Early Social Psychological Theories

For more than 70 years, social psychology has provided a variety of frameworks from which hypotheses about the causes and consequences of aggression could be derived and tested. These theories, although distinct, have also tended to overlap as new knowledge has extended an existing framework of aggressive behavior. The earliest influential theory from social psychology was the frustration-aggression hypothesis.

The Frustration-Aggression Hypothesis

During 1939, partially in response to World War II and partially in response to the spreading influence of psychodynamic theories in the US, Dollard et al. (1939) proposed the first systematic theory of aggression. Using assumptions from psychoanalytic theory, they focused on the frustration caused when a goal is blocked, and suggested that "the occurrence of aggressive behavior always presupposes the existence of frustration," and that "the existence of frustration always leads to some form of aggression" (p. 1). Although this theory enjoyed some empirical support, it quickly became obvious that frustration does not always lead to aggression, and that not every act of aggression can be traced back to frustration. Frustration-aggression theory was revised to incorporate the possibility that frustrations can elicit responses other than aggression (e.g., to escape or to find another way to achieve a goal), and that the inclination which will be acted upon is the one that best reduces frustration. In this revised formulation, people learn through experience to respond to frustrations with aggressive or nonaggressive responses.

Learning Theories

The earliest theory of learning in modern psychology explains behavior in terms of *classical conditioning* – learning to associate one thing with another. Pioneered by Pavlov, this approach suggests that once people mentally pair things together, they become 'conditioned' to expect those things to always occur together. This theory was later supplemented with theories of *operant conditioning* developed by Thorndike and Skinner, which suggest that people are more likely to repeat a behavior that has been rewarded and less likely to repeat a behavior that has been punished. In aggression research it has been shown that children can be taught to behave aggressively through rewarding aggressive behavior (*positive reinforcement*) or removing a painful consequence after aggression (*negative reinforcement*). In addition, children learn to discriminate between situations where aggression has a desirable consequence and when it does not, and to generalize this knowledge to new situations. Although such research demonstrates that aggression can be learned through conditioning (e.g., Eron et al., 1971), it was clear by the 1960s that such processes could not explain the acquisition of all learned aggression.

Bandura proposed that social behaviors, including aggression, could be learned through observing and imitating others (i.e., via *observational learning*). In his classic experiments, children observed a film of an actor hitting a 'Bobo Doll' in several novel ways. The children later imitated the behavior in the absence of any classical or operant conditioning. Bandura also developed the concept of *vicarious learning* of aggression, and showed that children were especially likely to imitate models that had been rewarded for behaving aggressively. In *social learning theory* (later called *social cognitive theory*), Bandura hypothesized that the way people mentally construct their experiences is crucial. People may see one person hit another, but will also decide how competent they feel to do the same, and will make assumptions about what constitutes a normal way to respond when someone provokes you. In this way, making inferences about observed aggression not only increases the likelihood of imitating it, but also expands the range of situations to which that response might be generalized (see Bandura, 1986). There is considerable research support for social cognitive explanations of aggression. People sometimes imitate aggressive models, especially if the aggressive behavior is rewarded or carried out by a person who is heroic, admired, of high status, attractive, or similar.

Arousal: Cognitive Labeling and Excitation Transfer

The emergence of cognitive psychology inspired a plethora of new approaches to aggression by social psychologists. Early in this period, researchers explored the way people make meaning of physiological arousal, a known precursor to aggression.

Researchers such as Schacter found that when people are aroused, they look for cues in the environment to help them attribute the cause of their arousal. For example, Schacter and colleagues found that if aroused people were exposed to another person who was angry, they tended to *cognitively label* their arousal as being angry themselves. Zillmann (1979) extended this concept with *excitation-transfer theory* (ETT). Physiological arousal, however produced, dissipates slowly. ETT posits that if two arousing events are separated by a short amount of time, arousal from the first event will add to arousal from the second. However, the cognitive label given to the second event will be misattributed as being relevant to all of the arousal experienced, thus producing an inappropriately strong response (e.g., becoming angry to a level far greater than might be expected for a minor provocation). Because the cognitive label (or attribution) is crucial in determining behavior, strong anger related to excitation transfer may persist long after the arousal itself has dissipated.

Mainstream Cognitive Theories

Information Processing and Script Theories

The confluence of computer availability and the growing dominance of cognitive approaches to psychology in the 1980s heralded a major change of direction in social psychological aggression research. For the first time, researchers started to conceptualize the acquisition of social behavior in terms of computerlike processes – inputs, outputs, and the processing of information. Two key theories of aggression emerged – the Social Information Processing (SIP) theory of Dodge (1980) and Script theory from Huesmann (1982). SIP theory emphasized the way people perceive the behavior of others and make attributions about their motives. A key construct in SIP theory is the *hostile attributional bias* – a tendency to interpret ambiguous events (such as being bumped in a corridor) as being motivated by hostile intent. This bias has been extensively studied and has been found to reliably predict aggressive behavior.

Script theory emphasizes the acquisition of scripts for behavior (much like an actor's script) through either direct experience or observational learning. Once encoded in semantic memory, *scripts* define particular situations and provide a guide for how to behave in them. In script theory, a person faced with a particular situation first considers a script relevant to that situation, assumes a role in the script, assesses the appropriateness or likely outcome of enacting the script, and if judged appropriate, then behaves according to the script. If a person habitually responds to conflict by using scripts that include behaving aggressively, these scripts may become more easily brought to mind (i.e., chronically accessible), become automatic, and generalize to other situations, increasing the likelihood of aggression in a growing number of spheres of life.

Cognitive Neoassociation Theory

Cognitive Neoassociation Theory (CNA) reformulated the frustration-aggression hypothesis within the framework of emerging knowledge about neural connectivity. Assuming that concepts, emotions, memories, and action tendencies are interconnected within the brain's associative neural network, Berkowitz (1989) posited that aversive events such as frustrations, provocations, or unpleasant physical environments produce negative affect, which is neurally linked to various thoughts, feelings, and behavioral tendencies that are themselves linked to both fight and flight tendencies. Depending on the characteristics of the person and the situation, one response set will eventually dominate, with dominant 'fight' responses linked with anger and being more likely to elicit aggression. Importantly, higher-order processes such as making attributions about another's motives or thinking through the consequences of an aggressive response may cause a person to moderate an aggressive impulse in this model.

Current Theories

The General Aggression Model

The General Aggression Model (GAM; Anderson and Bushman, 2002) is the most recent and broadest theory of aggression processes to date. It is a biosocial-cognitive model designed to account for both short- and long-term (developmental) effects of an extensive range of variables on aggression. GAM can explain the widest range of aggressive behaviors, including those not based around aversive events or negative affect. In addition, it is arguably the model that has the most empirical support. GAM unifies previous major models of aggression from the field of social psychology into a single framework, but also incorporates knowledge from other disciplines in psychology.

The model itself is deceptively parsimonious. Every instance of aggression involves a person, with all their characteristics (e.g., biology, genes, personality, attitudes, beliefs, behavioral scripts), responding to an environmental trigger such as a provocation, an aversive event, or an aggression-related cue (lower portion of **Figure 1**). These *person* and *situation* variables influence the person's *present internal state* – cognitions, affects, and physiological arousal. Depending on the nature of activated knowledge structures (which include affect), and on how

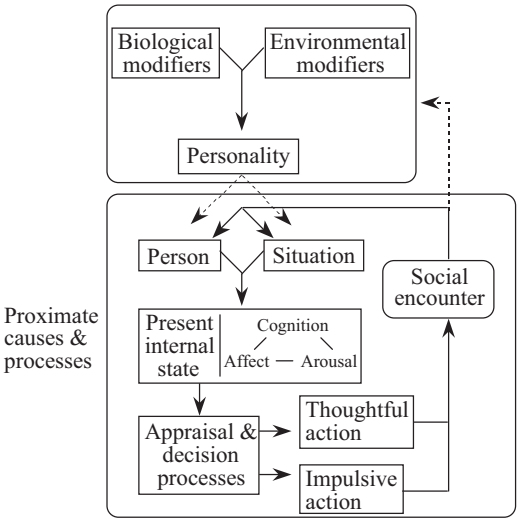

Figure 1 General Aggression Model. From Anderson, C.A., Anderson, K.B., 2008. Men who target women: specificity of target, generality of aggressive behavior. Aggressive Behavior 34, 605–622. Reprinted by permission.

aroused the person is, the person's immediate response may be an impulse to aggress. The person may act on this impulse, but if they have the time and cognitive resources to do so, and if the immediate response is undesirable, a period of appraisal and reappraisal will follow. Consequences are then thought-through, alternate responses considered, and a considered response made. The resulting behavioral action may or may not be aggressive, but in any case all actions feed back into the immediate situation and also influence the person's psychological make-up (i.e., their personality).

Underlying the GAM are detailed assumptions that take into account a myriad of within-person factors, a range of possible triggers for aggression, known internal psychological processes, and the means by which behavior is reinforced and learned. In terms of the latter, knowledge structures such as schemas (a grouping of knowledge, feelings, memories, perceptions and notions about typical behavior that is centered around a particular theme) and scripts (knowledge about how people typically behave in a given situation such as during conflict) are person factors that can not only impel a person to be aggressive in the moment, but also change to reflect our experiences (upper portion of **Figure 1**). Thus, experience leads to changes in the type, content, and accessibility of knowledge structures, which are seen as the basis of personality.

Together, these features of GAM can be used to explain short- and long-term aggression across a range of forms and functions, including the three key dimensions already noted: degree of hostile/agitated affect; degree of automaticity versus conscious thought; and degree to which the goal is to harm the victim versus benefit the perpetrator. Phenomena as different as sexual and nonsexual aggression against women (e.g., Anderson and Anderson, 2008), personality effects on violent crime (Hosie et al., 2014), and dozens more are well explained by GAM.

Aggression Research Methodologies in Social Psychology

As a social behavior, aggression has been primarily studied using methodologies from social psychology. Each of these methodologies has specific strengths and weaknesses, but, importantly, the shortcomings of each methodology can be overcome with the strengths of another. This allows aggression researchers to be strongly confident of an effect where findings converge across methodologies (Warburton, 2013).

Laboratory Assessments of Aggression

Laboratory experiments provide the strongest evidence that a particular factor may play a causal role in aggression. This is because that factor can be manipulated whilst all other factors are (in theory) held constant (e.g., all participants may have an identical experience in the laboratory except for watching a violent or a nonviolent movie clip). Aggression experiments typically measure short-term increases in mild forms of aggression or in known precursors such as aggressive thoughts and feelings. For example, researchers might measure whether aggression-related thoughts are more activated in one group of participants compared with another by testing reaction times to identify aggression-related (hit, blood) versus neutral (sew, rose) words. Aggressive feelings are typically measured by having participants rate the degree to which they feel emotions such as anger, antagonism, and unfriendliness.

Measuring aggressive behavior itself has a long history involving ethical, reliability, and validity concerns. For ethical reasons, serious harm cannot be used as an aggression measure in laboratory experiments. However, numerous valid and reliable aggression measures have been developed, usually involving a contrived laboratory situation that allows participants to behave in a way that they *believe* will harm another, but in which no person is actually hurt. Early measures included counting the number of aggressive acts a child would make toward a target, and the willingness of an adult to deliver a (fake) electric shock to another person purportedly being tested for their ability to memorize stimuli under conditions where they would be 'punished' for mistakes. More recent methods include measuring the duration and/or loudness of aversive 'noise blasts' delivered to an opponent in a competitive reaction time (CRT) game, the amount of hot chili sauce assigned for eating by a stranger known to dislike hot foods, and the number of difficult puzzles that require solving by another person in order to win a reward. Although such measures have been criticized for being unlike 'real-world' situations and subject to biases such as the desire to please (or displease) the experimenter, well-designed modern experiments overcome such problems using careful cover stories and scripts, and have been shown to predict real-world aggression.

Nonexperimental Research about Aggression

Nonexperimental research has the distinct strength that it can examine a wide range of 'real-world' aggressive phenomena and can be used to examine longer-term effects such as the development of a more aggressive personality. *Longitudinal studies* (in which key variables are measured at multiple points in time) are particularly valuable, because they can measure the development and change of aggression over time within individuals, and examine long-term effects of wideranging factors such as home environment, personality, and media violence exposure. In addition, the logical impossibility of a later-introduced factor causing an earlier-mentioned behavior, along with use of recent advances in statistical techniques, allow some causal inferences to be drawn.

Cross-sectional studies (in which all variables are measured once) are also valuable, but require cautious interpretation. Causal inferences are risky, because of the possibility that not all relevant factors were measured and taken into account. Nevertheless, such research has contributed substantially to theory testing and development by providing the opportunity to test causal theory-derived hypotheses and alternative explanations to the causal theory.

Observations of Aggression in Social Psychology

Some of the earliest and most powerful social psychological research of aggression was conducted through observational research, some in the laboratory (e.g., Bandura's Bobo Doll experiments) and some in the field (e.g., studies of aggression on playgrounds). Such studies have the distinct advantage of

observing and recording actual rather than self-reported aggressive behavior, often in the participants' natural environment. Importantly, issues that sometimes arise from self-report questionnaires (e.g., biased responding, lack of self-awareness or capacity to report thoughts and feelings) are not relevant, and populations unsuitable for other forms of research (such as young children) can be examined. However, aggressive behaviors often have a low incidence in observed environments, and ratings of aggression can be somewhat subjective. Researchers overcome the latter issue by creating clear and comprehensive guidelines, detailing behaviors that should be coded (e.g., pushing, shoving, hitting, name calling), and thoroughly training the raters. Also, self-reports may be supplemented by reports of relevant others (e.g., parents, teachers and peers). Indeed, converging data from multiple sources often provides the strongest evidence (Anderson et al., 2007; Warburton, 2014).

Brain Scanning Techniques to Study Aggression

Social psychologists are now using brain-scanning techniques to study aggression, most notably in the field of media violence. Such techniques have the advantages that they can be used on many types of participants, participants cannot 'fake' their responses, and participants do not have to be self-aware to provide valid responses. Brain scans are particularly valuable for assessing factors difficult to measure using other methods such as desensitization to violence, fear responses, and emotional arousal. Functional magnetic resonance imaging (fMRI) studies identify brain activity by measuring changes to blood flow, but are accurate only to a few seconds across time. Brainwave activity measured by electroencephalography (EEG) and magnetoencephalography (MEG) are extremely accurate in terms of the timing of changes to brainwaves, but cannot give accurate locations within the brain. Thus, using both techniques to study the same hypotheses leads to better understanding. Brain-scanning studies have some drawbacks – they generally use small samples because of the cost involved, they need to average images using sophisticated software and sometimes their data are hard to meaningfully interpret.

In typical aggression studies, participants are scanned whilst experiencing one or more stimuli (such as playing a violent or nonviolent video game) or doing various tasks, such as rating different types of pictures or making decisions. Thus, researchers can compare activation patterns to determine whether changes (such as desensitization) occur over time, one type of stimulus has different effects than another, or different groups (e.g., high vs low media violence consumers) typically respond differently.

Research Findings: Determinants of Aggression

Development and Stability Over Time

Scholars studying social development have shown that the frequency of physical aggression typically peaks in the toddler years and then decreases across the life span. Importantly, the degree to which one person is aggressive relative to others of the same age is fairly stable across the life span. Aggressive children tend to become adolescents and adults who are more aggressive than their peers (Bushman and Huesmann, 2010).

Person Factors

Numerous factors in a person's make-up have been shown to increase the likelihood of aggressive behavior. Not all are studied directly in social psychology, but all are taken into account in current social psychological models of aggression.

Gender Differences in Aggression

Overall, males are generally more aggressive than females, and this applies from early in childhood through the life span. This is especially true for physical aggression and violent behavior, although women are as physically aggressive as men when strongly provoked. Men are more likely than women to use direct forms of aggression, but the reverse is true for women, who are more likely to use forms of indirect aggression, including relational aggression.

Within intimate relationships, however, women are somewhat more likely to use physical aggression than men, though for different purposes and with different results. For example, men are much more likely to strike with a fist (women with an open slap), which is one reason why intimate partner violence yields many more women requiring medical attention than men.

Trait Anger

Trait anger reliably predicts an aggressive predisposition. It is characterized by extreme sensitivity to provocation and a considerably increased inclination to respond with aggression once provoked.

Callous Unemotional Personality Traits

There are three personality styles under this umbrella – psychopathy, Machiavellianism, and narcissism. All three are linked with high levels of aggression, lack of empathy, and curtailed emotional responding. Individuals of all three types routinely use aggression instrumentally to obtain desired goals, but narcissists and psychopaths are also prone to reactive aggression. Narcissists often respond aggressively when they feel threatened (particularly by insults, humiliations, or other threats to their inflated ego), or when they fear that their flaws may be exposed. Psychopaths, particularly those with secondary psychopathy characteristics, are often impulsive, fearless, and unconcerned about negative consequences to themselves or victims – a potent mix for a person already predisposed to aggression. Machiavellians most typically use instrumental aggression to achieve their goals and feel little or any remorse for harmful consequences to others. They do, however, consider potential consequences to themselves, and are thus more likely to aggress indirectly so that there is little likelihood of being held responsible for their actions.

Impulsivity, Executive Control, and Self-Control

Impulsivity is a temperament variable often noticeable from early infancy, and is a reliable predictor of aggression, presumably because impulsive people have difficulty curbing aggressive impulses. In contrast, people are less aggressive if they have greater control over their emotions, greater

self-control, and a stronger capacity to inhibit their impulses (Moffitt et al., 2011).

Intelligence

There is not a great deal of research on IQ and aggression, but some studies have found links between low IQ and higher levels of aggression in children, particularly in children with poor verbal intelligence and/or with low self-control.

Personality Traits – The 'Big Five'

Research on the 'Big Five' personality traits and aggression has generally found that people low in agreeableness and high in neuroticism are more aggressive and violent. Furthermore, both of these dimensions are associated with aggressive emotions, and low agreeableness is also associated with greater aggressive thinking (Barlett and Anderson, 2012).

Hormones

The hormone most consistently linked with aggression is testosterone. Males have around 10 times as much testosterone as females, and levels are much high in older teenagers and young adults than in older men. Interestingly, when people dominate others, their testosterone levels typically increase, along with their levels of aggression. There also is evidence that testosterone's effect on aggression is a by-product of its effect on dominance. There also may be links between low levels of estrogen and progesterone and aggression, although results are mixed. Finally, emerging evidence suggests that low levels of oxytocin may be linked with increased aggression.

Genetic Predispositions

Although aggressive behavior has a considerable learned component, studies show that inherited characteristics account for perhaps a quarter to a third of an aggressive predisposition (Tuvblad et al., 2009). More than a dozen genetic markers have been linked with aggressive and antisocial behavior, although links are rarely direct. Typically, genetic predispositions more directly relate to temperament variables such as impulsivity, which are themselves linked with greater aggression. The two most widely studied genetic markers of aggression are a polymorphism in the promoter of the monoamine oxidase A gene (MAOA) and a variation in the 5-HT serotonin transporter gene. Crucially, in line with the emerging field of epigenetics, the MAOA gene polymorphism seems to interact with a child's early environment, so that aggression and antisocial behavior are most likely in those who have this genetic trait *and* also experience childhood maltreatment (Kim-Cohen et al., 2006).

Factors from the Environment and Cues for Aggression

Provocation

Perhaps the single greatest trigger for aggression is provocation by another person (Bettencourt et al., 2006). However, provocation does not need to be direct. People can be provoked to aggression by social exclusion, having rumors spread about them and a range of other 'indirect' provocations.

Weapons

Weapons are one stimulus that almost all people conceptually link with aggressive behavior. Research consistently shows a 'weapons effect' whereby people who view a real or virtual weapon tend to have aggression-related cognitions primed in semantic memory, and become more likely to behave aggressively. Interestingly, this effect varies by type of weapon and hunting experience (see **Figure 2**).

Violent Environment

According to social cognitive models, people who are exposed to a lot of violence, virtual or real, will have an associative neural network with a lot of aggression-related knowledge structures, including aggressive behavioral scripts. This is borne out by research demonstrating that people from violent environments, whether homes, neighborhoods, or war-torn countries, have a greater predisposition to be aggressive (e.g., Aguilar et al., 2000).

Violent Media

The same principle applies to exposure to violent media. It is one of the most studied phenomena by social psychologists, and several hundred studies converge across all major research methodologies in finding that violent media exposure increases the likelihood of aggressive behavior and causes desensitization to violence in both the short- and long-term (Warburton, 2014). In addition, greater exposure to media violence has been linked to hostile biases in thinking, increases in aggressive thoughts and feelings, and decreases in empathy and prosocial behavior (see Anderson et al., 2003; Krahe et al., 2012, for reviews).

Environmental Stressors

A variety of environmental stressors can increase the tendency to aggress. The most notable are physical pain, bad-smelling odors, loud or aversive noises, and hot temperatures. Importantly, it seems that aggression is most likely when the individual has no control over those environmental stressors.

Anonymity

Anonymity in some circumstances increases the likelihood of aggressive behavior. It is much easier to hurt another

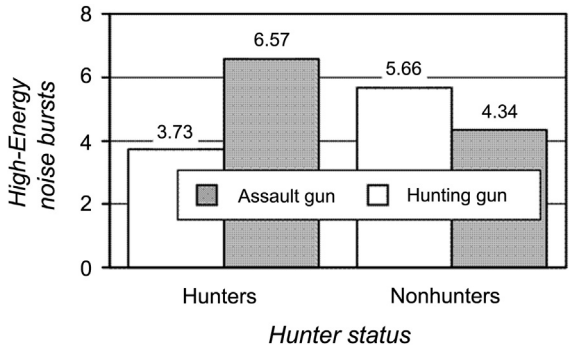

Figure 2 Aggressive behavior (number of high-energy noise bursts directed at the opponent) as a function of hunter status and weapon prime. From Bartholow, B.D., Anderson, C.A., Carnagey, N.L., Benjamin, A.J., 2005. Interactive effects of life experience and situational cues on aggression: the weapons priming effect in hunters and nonhunters. Journal of Experimental Social Psychology 41, 48–60. Reprinted by permission.

if an individual believes there will be no consequences, and anonymity allows a person to experience 'deindividuation' – a lessening of the restraints on antisocial behavior normally accorded to people perceived as being 'individuals.'

Social Rejection

Humans have a fundamental need to feel socially included and to have supportive and enduring relationships. When this need is thwarted through social exclusion or rejection, people sometimes behave more prosocially to facilitate reinclusion. However the dominant response to such rejection is to aggress, especially when the person can do so without significant social reprisals (e.g., Warburton et al., 2006).

Substances

Alcohol intoxication consistently causes both men and women to behave more aggressively inside and outside the laboratory, and is linked with a substantial proportion of murders, assaults, rapes, and incidents of intimate partner violence. Importantly, this increase is due to the aggressor experiencing a diminished ability to inhibit their aggressive impulses. Thus people who are predisposed to behave aggressively are most affected (Giancola, 2000). Aggression has also been linked with other substances that cause disinhibition and/or an increase in physiological arousal, such as stimulants, amphetamines, and methamphetamines.

Research Findings: Factors that Mediate Aggression

The previous section examined factors within the person and in the environment that can trigger or increase the likelihood of aggression. This section deals with the three key types of internal processes noted in GAM that can increase or decrease the likelihood of aggression.

Emotion/Affect

Early models of aggression placed considerable emphasis on the role of negative emotions in causing aggressive behavior, and research has linked several emotions to an increased likelihood of aggression, most notably anger, shame, jealousy, and frustration. Of these, anger is the most researched. Although anger can precede aggression, the pathway is far from a simple cause and effect. Anger increases aggression primarily through reducing inhibitions, narrowing attentional focus to cues for aggression, and alerting people to cues for potential threats (see Anderson and Bushman, 2002). Shame has also been linked to increases in aggression, primarily when the shamed person feels their personal flaws have been exposed. Jealousy has also been linked with aggression and in particular with intimate partner violence.

Recent research suggests that the anticipation of how one will feel in the future can be as important as how one currently feels in determining whether a person will be aggressive.

It should be noted that some emotions can be a protective factor for aggression. For example, empathy (taking another person's perspective and having concern for them) is consistently related to lower aggression.

Cognition

Recent models of aggression have focused increasingly on the cognitions that may underlie aggression. These include attitudes, beliefs, expectations, perceptions, ideas, and concepts as well as aggregated cognitions such as schemas and scripts. It is clear that a variety of external triggers can increase the accessibility of aggressive cognitions in semantic memory. These cognitions may be activated but below the threshold of awareness, or activated to the point of conscious awareness. In either case they can elicit an aggressive behavioral tendency through the priming of aggression-related action-tendencies, the activation of aggressive scripts for behavior, or through the influence of hostile biases on the interpretation of cues from the environment.

Arousal

Physiological arousal and emotional arousal are both linked with increased aggression, and this is true regardless of what caused the arousal in the first instance. This may be due to one or more of several factors. First, arousal increases the likelihood that a person will act on an aggressive action tendency or impulse rather than think through the consequences of an aggressive action. Second, excessive levels of arousal feel unpleasant, and can elicit aggression in the same way as other unpleasant experiences. Third, arousal may be part of a fight or flight response system that bypasses rational thought and impels aggressive action. Fourth, arousal may be cognitively labeled as resulting from anger, thus causing the person to feel and act angry. Excitation transfer may compound this effect, leading to a disproportionately aggressive response. Finally, low levels of arousal may facilitate aggression if people lack the energy and motivation to inhibit aggressive impulses.

Societal Aggression and Violence – a 'Risk Factor Approach'

It is one thing to know the types of factors that increase the likelihood of aggression, but quite another to understand aggression and violence in wider society. No single factor described in this article is either sufficient or necessary to elicit violent or other extreme forms of aggression. These only occur when there is a confluence of 'risk factors' for aggression (such as those detailed in this article) and insufficient 'protective factors' to inhibit aggression. The greater the number of risk factors and the stronger their influence, the more likely it is an individual will behave aggressively, especially when protective factors are few or of little impact (Anderson et al., 2007). The problem for researchers is that the greater the number of risk factors they need to consider when studying aggression and violence, the more difficult it is to determine how the factors interact with each other, and to ascertain the relative impact of each on an act of aggression or violence. However, this is the task that faces social psychologists as they try to make sense of mass killings, school shootings, and societal violence. Importantly, the more that is known about risk factors and protective factors, the greater the ability of psychologists to understand

and prevent societal violence, and indeed aggression in everyday life.

Conclusions

Human aggression has been researched by social psychologists and others for many decades. The result is a large body of knowledge about the factors within people and from the environment that increase the likelihood of aggression, along with a more detailed understanding of the processes that occur in the mind and brain during an instance of aggression. Well-validated models such as GAM have been built around these findings. Less is known about the ways in which risk factors for aggression and violence interact with each other and with protective factors. Still, much is known about how to decrease the likelihood of societal violence. Yet, this knowledge is, in our view, not sufficiently used in society at large.

One ongoing world crisis illustrates this problem. Global climate change as a result of human activity is now a widely (though not universally) accepted fact. In combination with work from a variety of biological, sociological, historical, and anthropological, findings, GAM suggests that there are at least three ways that such rapid global warming will increase violence worldwide. The most direct is the simple heat effect mentioned earlier. A second way is that increased poverty, malnutrition, and family disruption will increase the proportion of children who develop into aggression-prone adolescents and adults. The third way involves ecomigration, the movement of populations from ecological disasters to other regions, and the intergroup conflicts that will result (Anderson and DeLisi, 2011). We hope that the knowledge gained by decades of aggression research in social psychology will be put to better use in the future.

See also: Attitudes and Behavior; Authoritarian Personality; Prosocial Behavior and Empathy; Social Cognition; Social Psychology; Tyranny.

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