

Relational Versus Physical Aggression: An Overview

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There is much neurological and cognitive research contributing to explanations of physically aggressive behavior. The brain's activity and functioning are significant in the determination of reasons for this form of aggressive behavior. Relational aggression is another form of aggression, however, and most research in this area focuses on the social or peer relationship side of relational aggression. Little, if any, research has been done on the neurological contributions to relational aggression. Since relational aggression and overt aggression both hold the same intention of inflicting harm on another person, it is reasonable to compare these two forms of aggression and their possible similarities. This review focuses primarily on neurological differences and cognitive deficits.

Much of the research on aggression deals with neurological components as contributing factors (Lyvers, M., 2000; Pihl, R. O., & Peterson, J. B., 1993; Raine, A., 2002; Seguin, J. R., Pihl, R. O., Harden, P. W., Tremblay, R. E., & Boulerice, B., 1995; Spont, M. R., 1992), and mainly focuses on violent behavior or overt aggression. There is much less research regarding another form of aggression called relational aggression. In fact, there is little or no information on neurological components of relational aggression. It is because of this gap in the literature that this paper focuses on relational aggression and it is because both forms of aggression have the same intention – namely, to cause harm - that this paper addresses potential similarities between the two. The goal is to compare physical aggression and relational aggression in an attempt to share insight on a neurological and cognitive basis for future research on relational aggression.

Relational Aggression

Relational aggression is an attempt to “harm others through purposeful manipulation or damage to their peer relationships (e.g., using social exclusion as a form of retaliation)” (Crick, 1996.). And so, relational aggression deals mainly with social issues and damage related to interpersonal relationships. This form of aggression can be just as destructive to an individual as overt aggression, particularly when one puts a great emphasis on their social interactions and relationships. Since the intention is to inflict harm on another, and is purposefully chosen to inflict the most damaging kind of harm, relational aggression is just as serious an issue as overt aggression.

Research suggests that relationally aggressive

individuals may be at high risk for numerous adjustment difficulties including feelings of rejection, loneliness, depression, and isolation (Crick & Grotpeter, 1995). A relationally aggressive individual might have difficulties with peer relations, and over time might lose friends, miss out on opportunities, and develop low self-esteem. The lack of a support system and deteriorating feelings of self-worth can easily heighten the risk of depression, anxiety-related issues, or even a personality disorder.

Crick (1996) found that relational aggression is stable over time and is predictive of future social maladjustment. If this behavior is stable over time, the individual is not forming new patterns of behavior, and may be at risk for future behavior problems. It could be that the relationally aggressive individuals are not aware that their behavior is causing any aversive reactions, which would suggest possible cognitive impairments. Also, in a sample of girls, Crick found negative changes in adjustment as the behavior persisted, meaning that the relationally aggressive individuals became more rejected by peers over time. This confounds the issue because, if social relationships are considered important to an individual, than the individual should notice when the relationships are faltering, and adjust their behaviors accordingly. Since relational aggression appears to be stable over time, it is as if these individuals are either not concerned with social relationships, or they lack the cognitive abilities, such as an executive functioning or problem solving ability, to both be aware of the rejection of their peers, and/ or change their behavior patterns.

Clinical and research literature highlights frequent cases of impairments in executive functioning and problem solving ability in physically aggressive individuals. These impairments usually involve the frontal regions of the brain. The following sections address the neurological and cognitive components of physical aggression, and suggestions are made for potential similarities with relational aggression.

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Neurological Contributions to Aggression

In general, damage to the frontal lobe of the brain has been shown to result in a disruption of “aspects of autonomy, (such as) self-control, delay of gratification, drive inhibition, and the anticipation of future consequences, as well as selective attention and certain kinds of abstract problem-solving” (Lyvers 2000,). Research has also shown that limits in one’s problem solving abilities in social situations leads to physically aggressive behavior. A possible explanation for aggressive behavior is that individuals that are violently aggressive tend to use aggressive behavior in adverse conditions because they lack appropriate problem solving abilities (Spoont, M. R., 1992). Raine (2002) suggests that damage to the prefrontal cortex results in the inability to use reasoning skills adequately and difficulties making appropriate decisions, which contributes to behaviors such as impulsivity, recklessness, and irresponsibility. Also,

“the prefrontal cortex is part of a neural circuit that plays a central role in fear conditioning and stress responsivity... and individuals who are less autonomically responsive to aversive stimuli... would be less susceptible to socializing punishments, and hence become predisposed to antisocial behavior” (Raine, 2002).

It is also thought that the prefrontal cortex regulates arousal and since there are deficits in arousal in aggressive individuals, they try to compensate by acting in a stimulation-seeking behavior (e.g. aggression, impulsivity, etc.). All of these findings suggest one’s ability to solve problems and deal with social situations contributes to their behavior. Because individuals who exhibit physically aggressive behavior appear to be deficient in these abilities, they behave in an aggressive manner.

Interestingly, “damage to areas of the prefrontal cortex reduces inhibitions and self-concern, causing an indifference to the consequences to one’s behavior. Thus, areas of the prefrontal cortex are thought to modulate social skills” (Fishbein, 2000). Also, damage to the prefrontal cortex is related to posttraumatic violent behavior (Fishbein, 2000) and people with this damage “often exhibit impairments in ability to make rational decisions in personal and social matters, in addition to difficulties in the processing of emotion” (Fishbein, 2000). Not only are people shown to behave in a more violent manner, but their ability to make decisions is impaired, which suggests they are thinking differently about violence and the repercussions involved and their mental processes are lacking. This is all due to an alteration in the brain, specifically the prefrontal cortex, which indicates there is a distinct cognitive change.

Furthermore, “impaired executive cognitive functioning (ECF) compromises the ability to interpret social cues during interpersonal interactions, which may lead to misperceptions of threat or hostility in conflict situations. ECF impairment may further undermine

the ability to generate alternative socially adaptive behavioral responses and to execute a sequence of responses necessary to avoid aggressive or stressful interactions” (Fishbein, 2000).

And so, when an individual perceives something or someone as a threat, they are more likely to react violently if they are ECF impaired. These functions are different from a nonviolent person and the differences result in a misinterpretation of intentions being threatening, which leads to violent defensive actions. “Particular regions of the prefrontal cortex (e.g. the orbitofrontal region) appear to play a role in forethought, behavioral inhibition, and capacity to learn from experience” (Fishbein, 2000). If violent individuals are not able to experience the same levels of forethought and learning from experience than nonviolent individuals, then they are not cognitively processing information the same way a nonviolent person would. Furthermore, “there is recent speculation that a poor connection between functions of the prefrontal cortex and structures within the limbic system may be responsible for disinhibited behavior, inability to act on an assessment of costs versus benefits, and poor emotional regulation” (Fishbein, 2000). These are biological differences in individuals that affect cognition which indicate not only a better understanding of why they behave the way they do, but an idea that the root of this behavior lies in the structures of the brain. Since relationally aggressive individuals would need higher level social skills to manipulate social situations, it is possible that when they perceive someone as a threat, they do not react with physical violence, but emotional violence. Conflict situations are still instigating an aggressive behavior, albeit a non-physical form of aggressive behavior.

Physically aggressive behavior also appears to be linked to the limbic system in the forebrain, which holds the hypothalamus and amygdala. Stimulation of the hypothalamus or amygdala has been shown to lead to aggressive behavior (Clemente, C. D. & Chase, M. H., 1973). Zagrodzka, Hedberg, Mann, and Morrison (1998) emphasized the role of the amygdala with aggressive behavior by looking at cats with and without lesions in their amygdala. The cats were observed both while awake and during rapid eye movement (REM) sleep. In either state, the cats did not display any aggressive behavior, but when the cats were exposed to aggression provoking situations, the cats with amygdalic lesions did not act aggressively. Also, the cats with lesions did not show normal predatory tendencies when mice were placed in their environment. The results show that the amygdala may play a role in aggressive behavior and dysfunction or deficit in this area leads to a lack of aggressive behavior.

Glucocorticoid hypofunction or glucocorticoid plasma levels are also associated with physically aggressive behavior. Halasz, Liposits, Kruk, and Haller (2002) used c-Fos protein immunocytochemistry to study the effects of implanting low-release glucocorticoid pellets into rats. When the rats were exposed to an intruder, the level of c-Fos activation was induced in the brain areas related to aggression,

including the amygdala and hypothalamus. When glucocorticoid hypofunction was induced, there was an increase in attacks, especially to vulnerable parts of the intruder, and there was a dramatic increase in the activation of brain centers involved with stress response such as the hypothalamus and fear reactions such as the amygdala. Thus, glucocorticoid hypofunction is related to stress sensitivity and fear and leads to physically aggressive behavior.

Further examination of the amygdala's role in aggressive behavior leads to consideration of the neurotransmitter serotonin. Serotonin is regulated through the work of the forebrain, an area important in executive functioning. This suggests that serotonin levels influence a threshold function in information processing and behavioral reactions. Therefore, physically aggressive behavior may be linked to limits in problem solving abilities in social situations because of the influence of serotonin's regulation from the forebrain. Serotonin regulates chemical processes in the brain, such as response to pain, body rhythms, and sexual behavior. Reduced serotonin levels are associated with heightened aggression, and higher levels of serotonin are associated with reduced aggression in animals (Higley 1992; Popova 1991). In humans, "reduced brain serotonin function is associated with heightened vulnerability to depression, increased risk of violent suicide, propensity to exhibit aggressive or impulsive behavior, and susceptibility to alcohol abuse both among persons with psychiatric disorders and among the general public" (Phil, R. O. & Peterson, J. B., 1993).

Brain imaging has shown violent offenders have functional deficits in anterior regions of the brain, particularly in the frontal region. (Raine, 2002). Explanations for the deficits include reduced glucose in the frontal cortex, reduced frontal regional cerebral blood flow, and lower prefrontal concentrations of N-acetyl aspartate and creatine phosphate (Raine, 2002). Interestingly, individuals who have received damage to the prefrontal region of the brain "proceed to acquire an antisocial, psychopathic-like personality. These patients also show autonomic arousal and attention deficits to socially meaningful events" (Raine, 2002).

In general, the structures of the brain most often associated with physical aggression are in the frontal regions. These structures appear to be related to self-control, problem solving behavior, inhibition, and aggression. If the same issues of executive functioning and problem solving ability apply with regards to relationally aggressive individuals, the same regions of the brain would be important focal points of future research.

Cognitive Contributions to Aggression

Impairment in executive functioning is related to physically aggressive behavior. A study by Seguin, Pihl, Harden, Tremblay, and Boulerice (1995) investigated the relationship between cognitive deficits and physical aggression. They looked at four factors: verbal learning, incidental spatial learning, tactile-lateral ability, and executive functions. The results showed that the aggressive boys had diffi-

culties in executive functions, but not the other factors. Executive functions were defined as:

"capacities for the initiation and maintenance of efficient attainment of goals. They are typically derived from tests that assess primarily programming and planning of goal-oriented motor behavior skills, modulation of behavior in light of expected future consequences, anticipation of events in the regulation of behavior, learning of contingency rules and the ability to use feedback cues, inhibition of response set and flexibility (vs. perseveration), abstract reasoning, problem solving, sustained attention, and concentration" (Seguin, et al., 1995).

This explanation of executive functioning encompasses a wide range of abilities, and relational aggression can be attributed to the same abilities. As discussed previously, relationally aggressive individuals did not change their behavior over time even when rejected by peers. This relates to an apparent deficit in executive functioning in that behavior is not altered or modified in the apparent absence or ineffectiveness of feedback cues.

Problem solving ability is associated with physically aggressive behavior. A longitudinal study by Seguin, Phil, Harden, Tremblay, & Boulerice (1995) found that cognitive executive functions were poor on performance among physically aggressive males. In the words of Seguin et al:

"Poor performance on several verbal abilities, such as reasoning, planning, and problem solving in the verbal modality (which are associated with antisocial behavior), theoretically rely as much on executive abilities as nonverbal executive tests... the executive functions tests used in the present study required active formation of representations in working memory that needed to be temporarily stored, accessible, and free of interference as they were continually monitored and scanned according to goals and rules" (Seguin et al., 1995).

If an individual has difficulty using these cognitive functions, they are more likely to exhibit physically aggressive behavior. This suggests

"an association between history of aggressive behavior and impairment in executive functions most probably reflects an inability to organize several parameters simultaneously, uncover complex rules, anticipate consequences of choices and actions, and reflect abstractly (verbally or otherwise) in order to solve interpersonal and social problems. The capacity to reflect in impaired individuals may quickly be overwhelmed or their abilities poorly activated when they are in a motivational situation that calls for a more adaptive social response" (Seguin et al., 1995).

Therefore, the tendency to exhibit aggressive behavior may be a result of a lack of ability to use cognitive processes such as working memory or reasoning skills. The executive functions may be hard to access or use because of

obstructions of these functions or they may be overloaded easily. The working memory of these individuals may not be as large or smooth as non-aggressive people, which would make it harder for them to organize their thinking and formulate and understand the best action to take.

Relational aggressive individuals may also have difficulty with problem solving abilities because of their inability to resolve a conflict in a non-aggressive way (i.e. talking about a problem and proactively expressing their feelings or dismissing the conflict). Their ability to use reasoning skills might also be lacking due to a personal conflict that may or may not actually exist. Sometimes the relational aggressors simply perceive conflict when it is not actually there.

In a different light, problem solving skills and information processing might alter the way an individual views behavior. A study by Slaby and Guerra (1988) selected adolescents that were incarcerated in a maximum-security facility for having committed at least one violent criminal act and compared them with public high school adolescents. It was found that individuals with high levels of aggression also had low levels of problem solving skills and they generally felt that aggressiveness was a positive way to behave. This is thought to be somewhat related to information processing, although,

“it is unclear whether this hostile bias represents a deficit in processing information whereby aggressive children merely assume that others’ intentions would be similar to their own, presumably hostile, intentions, or whether this hostile bias reflects a more general set of “paranoid” beliefs about others’ motivations that might affect processing and interpretations of cues” (Slaby & Guerra, 1988).

This relates to cognition and how the aggressive individual is thinking and understanding information. There is a difference in the way these individuals are processing information and it results in aggressive behavior. Slaby and Guerra illustrate how an individual “generates consequences”. Slaby and Guerra explain that “An individual must generate or draw from an existing repertoire of available responses. If he or she holds the belief, for instance, that heightened self-esteem is a consequence of aggression, this response might be available for consideration during the response-evaluation step of information processing. However, this particular belief might also directly lead the individual to seek out opportunities to aggress” (Slaby & Guerra, 1988). It is possible that aggressive individuals have a limited cognitive pool of responses and if those responses are all related to aggression, then they are bound to behave in an aggressive manner and furthermore, find situations to engage in such behavior.

Relationally aggressive individuals might not realize their behavior is “wrong.” A contributing factor of this may be that authority figures tend not to recognize relationally aggressive behavior or punish individuals for it (Simmons, 2002). It may be that because the individual is not

hitting or punching anyone (obviously explicit signs of harmful aggression), the aggressor and others might not perceive the behavior as being problematic.

In support of this point, a study by Shahinfar, Kuipersmid, & Matza (2001) focused on social-cognitive and social information processing. Individuals that were victims of severe violence had significant levels of the measures of social information processing, including approval of aggression, hostile attributional bias, and social goals; witnesses to violence were more likely to perceive a positive outcome from violence (Shahinfar et al., 2001). A possible explanation is

“that having been a victim of violence enhances children’s perceptions of threat in the world, which affects appraisal of the social environment and the interpretation of the behavior of others. Having been a victim of severe violence may also accentuate the need for revenge and dominance of others as a response to one’s own experience” (Shahinfar et al., 2001).

The exposure to violence, whether it is as a victim or as a witness, appears to result in a particular form of cognitive thinking about violence in general. This relates to the phenomenon of thinking that the world and other people are a threat, which was previously suggested to result from a biological difference in the brain, whereas Shahinfar et al suggests this results from experience. And so, exposure to violence actually appears to change the way individuals think about violence.

This mechanism may be the same for relationally aggressive individuals. If an individual is a victim of relational aggression, that individual might exhibit relationally aggressive behavior for revenge or because they might simply see the aggression as a way to get what they want.

Intelligence is also linked to violent behavior. A study by Sigurdsson, Gudjonsson, & Peersen (2001), administered psychological tests to young juvenile offenders who had plead guilty to a criminal offense and then were given a conditional discharge. Sigurdsson et al found that

“as far as cognitive abilities were concerned the desisters (temporary or situational offending) scored significantly higher than the re-offenders (stable and persistent offenders) on the Standard Progressive Matrices and had better verbal memory recall on the GSS 1”.

The Standard Progressive Matrices specifically measured intellectual ability, but does not translate to I.Q. scores. The individuals who continually committed violent offences had lower intelligence scores than the individuals who committed violent offences on a temporary or situational basis. This suggests that cognition affects whether or not an individual will act in a violent manner. The results also suggest that low intellectual capacity may result in an inability to understand repercussions, socially acceptable behavior, or that these individuals are simply thinking on a different level than non-violent individuals.

Conclusion

Relational aggression and physical aggression are similar in that they both hold the same intention of inflicting harm on another person. Research on relational aggression mainly focuses on the social or peer relationship component of relational aggression. Little, if any, research has been done on the neurological contributions to relational aggression, which leaves this report to speculate on the similarities between neurological aspects involved with overt aggression and relational aggression. It is possible that individuals who exhibit relationally aggressive behaviors have neurologically related deficits and/ or cognitive differences that contribute to this behavior.

There are numerous contributions from the neuroscience literature explaining aggressive behavior from a biological perspective. The brain and its activity and functioning are predominantly significant in the determination of reasons for aggressive behavior. An underlying theme suggests the behavior is a result from limits in interpreting social situations adequately and lacking appropriate problem solving abilities. Since relationally aggressive behavior is stable over time and predictive of future social maladjustment (Crick, 1996), impairments in executive functioning and problem solving skills are possible. Considering the social nature of relational aggression, these individuals probably have some of the same differences in brain activity and functioning as physically aggressive individuals.

Future research should focus on neurological and cognitive components of relationally aggressive behavior. Due to the breadth of information regarding these issues in physically aggressive individuals, and the underlying intention of harm that both forms of aggression share, components related to physical aggression should be considered as a starting point to further understand relational aggression.

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