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Revisiting the Clockwork Orange: A Review of Theories of Aggressive Behaviour from the Perspective of the Ecological Systems Theory

Abstract

This paper aims to provide an analysis of principal theories and empirically proven risk and protective factors in the aetiology of violence and aggressive behaviour from the perspective of the Ecological systems theory. The paper is set to review theoretical and empirical findings on key factors in the development of aggressive behaviour. It starts with the individual level (genes, individual traits), across the microsystem and mesosystem (family, school, peers), through the exosystem (community, media, parent's workplace) only to include the broadest aspect of the macrosystem (culture, norms, governance, war, natural disasters). We present an overview of the most recent research findings on aggressiveness and violent behaviour as an impetus for public-health strategies and educational interventions that could prevent the development of aggression and violence in at-risk populations.

Keywords: *theories of aggression, aetiology, Ecological systems theory, violence, risk and protective factors.*

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1. INTRODUCTION

It has been almost 50 years since the release of Kubrick's "*A Clockwork Orange*" (1971), his famous dystopian postmodern masterpiece thesis on "ultra-violence" from the perspective of a juvenile gang of British delinquents. The movie posed a lot of interesting questions, namely those on the origins and contributing factors of violent behaviour in society, examined even today. Aggression and violence, as a social phenomenon, represent the focus of numerous studies, resulting in several emerging theories. Aggression does not exclude physical forms of violence but generally refers to less extreme deliberate behaviours that may cause negative psychological or physical consequences to others (Orpinas & Horne, 2005). Violence is a subtype of aggression, as all violent behaviour represents aggression, but most aggression is not violence. More precisely, violence is aggression intended to cause physical or emotional harm extreme enough to require medical attention or to cause death (Warburton, Anderson, 2015:373). Violence is defined as the deliberate use of physical force and power by threatening or acting on oneself, on another person, or on a group of people or the entire community, which may result in injury, death, psychological consequences, underdevelopment or deprivation (Krug et al., 2002). Various forms of aggression include physically harming another individual (i.*e. physical aggression such as hitting, biting, kicking, clubbing, stabbing, shooting*), hurting another individual with spoken words (*i.e. verbal aggression such as yelling, screaming, swearing, name-calling*), or hurting another individual's reputation or friendships through what is said to others verbally or digitally (*i.e. relational aggression*). Warburton and Anderson (2015:373) classify aggression as *direct* (with the victim physically present) and *indirect* (enacted in the absence of the victim; for example, smashing someone's property or spreading rumours). In relation to its function, aggression also differs and 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 deliberate plan to harm another individual to gain the 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 behaviour that is enacted so commonly, that the response is no longer thought-through (Warburton, Anderson, 2015:374).

This paper focuses on answering questions about the latest research evidence on empirically proven risk and protective factors in the aetiology of aggressive and violent behaviour, with particular emphasis on the importance of their proximal or distal impact. The paper aims to provide an overview of empirically established risk and protective factors in the aetiology of aggressive behaviour from the perspective of the Ecological systems theory. The main focus of the paper is placed on analysing the significance and shortcomings of major biological, psychological and social factors in the development of aggressive behaviour, in an effort to enhance public-health strategies and interventions that could prevent the development of aggression and violence in vulnerable populations.

2. AN OVERVIEW OF AGGRESSIVE AND VIOLENT BEHAVIOUR THEORIES

All significant analyses of violent and aggressive behaviour describe aspects of the nature-nurture dilemma. This duality is most visible in the works of Thomas Hobbes and J.J. Rousseau. From a biological perspective, Hobbes considered human beings to be animals with natural aggressive instincts, which society, through its laws and norms, had to control. On the other side, Rousseau developed the concept of humans as *noble savages*, emphasising their innate goodness in comparison to corrupting societal influences. The idea was that humans became aggressive due to laws and restraints forced upon them by society (Aronson et al., 2005). Sigmund Freud developed his instinct-based theory of aggression (1963, as cited in Ray, 2018). The focus point of the theories of instictivism was that humans were doomed by nature to be destructive because human aggressiveness was an impulse fed by energy (Ray, 2018). Freud explained aggression as a biological instinct, an eternal struggle between Thanatos (the instinct of death) and Eros (the instinct of life or desire), which consequently drives an innate rush for the fulfilment, and leads to a state of satisfaction. Human behaviour arises as a result of the said conflict, or the overcoming of either one or the other instinct (Žužul, 1989). For instance, should Thanatos become too strong, a child could use various aggressive methods to try and reduce it, such as expressing anger directly or indirectly, forming unacceptable urges into socially acceptable substitutions (sublimation), and types of aggression that take place in the imagination (Freud, 1995, as cited in Kušević & Melša, 2017).

Anna Freud developed the "hydraulic model" of aggression, describing the accumulation of aggressive energy as a consequence of inadequate expression of instincts. This process continues until the accumulated energy is sufficient to result in aggressive behaviour, regardless of barriers. Similarly, the ethologist Konrad Lorenz attempted to subsume human behaviour within instinctual animal behaviour. Lorenz described aggression as an innate combat instinct inherent to humans and animals, aimed at the survival of the individual and species at the evolutionary level (1966, as cited in Essau & Conradt, 2006). As aggressive energy accumulates in neural centres, it generates pressure for its release by appropriate stimuli. If these stimuli are not present, the organism begins the process of 'appetitive behaviour' – searching the stimuli needed for energy release. If none of these are found, and energy accumulates beyond a certain point, then behaviour might explode (Lorenz, 1970, cited in Dennen, 2005). For example, Schacter examined psychological *arousal* and found that when people were aroused, they looked for cues in the environment to help them attribute the cause of their arousal. 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 (Warburton, Anderson, 2015). Zillmann extended this concept through the *excitation-transfer theory* (1979, as cited in Warburton, Anderson, 2015:375).

Dollard et al. (1939, as cited in Eron, 1994) were the first ones to assign a significant role to the process of learning in the aetiology of aggression through the *frustration-aggression theory*. They claimed individuals become frustrated when they are prevented in reaching their goals, as frustration encourages an aggressive response (Beck, 2003), and stated that frustration always precedes aggression, which is always a consequence of frustration. A number of researchers subsequently criticised this view, especially Miller (1941, as cited in Eron, 1994), who denied the inevitability of aggression as an outcome of frustration, claiming that frustration can lead to several different responses, one of which could be aggression. The frustration-aggression theory was modified by Leonard Berkowitz (1962, as cited in Žužul,

1989), who claimed frustration does not directly lead to aggression but causes anger as an emotional state which then, with the existence of certain conditions, leads to aggression.

In contrast to the pessimistic instinctive theories, behavioural theories assume that aggression is adopted through learning. Zillman explained three ways of adopting aggressive behaviour: 1) through instrumental learning (positive reinforcement); 2) through learning stimuli related to aggression; and 3) through social learning (1979, as cited in Žužul, 1989). Bandura (1973), in his *Social learning theory*, explained that aggressive behaviour is adopted through direct or vicarious environmental experiences. A person observes aggressive models and notices whether it leads to positive or negative consequences. Social learning theory emphasises the role of the source and regulator of aggressive behaviour (earlier and present reinforcement of aggressive behaviour) and the instigator of aggressive behaviour (model, punishment, lack of reward, etc.) in a situation of emotional arousal and discomfort (Bandura, 1973).

Heider's *Attribution theory* explained aggressive actions as a response to frustration, which depended on whether a person attributed intent to the source of the frustration (1958, as cited in Aronson et al., 2015). Heider claimed people were trying to understand other people's behaviour by collecting information until they got a reasonable explanation or a cause of that behaviour (1958, as cited in Aronson et al. 2015). The locus of the cause could be something within the self (internal/dispositional cause), a factor in someone else or the environment (external/situational cause) (Bauman, 2015).

Two key theories of aggression considered the concept of the acquisition of social behaviour in terms of computer like processes - inputs, outputs, and the processing of information - the *Social information processing* theory by Dodge (1980) and the *Script theory* by Huesmann (1982). The Social information processing theory by Dodge (1986, as cited in Bauman, 2015) and later revised by Crick and Dodge (1994, as cited in Bauman, 2015), explained that the way in which children process social information directly influences their behaviour. The assumption was that children bring biologically defined capacities together with the memories of past experiences to a social situation. Those memories are integrated into cognitive structures called schemata, which become larger as children grow older and more experienced. Schemata can be used to guide decision making in future social situations, as children automatically and unconsciously process social information. Although the automaticity accelerates the social information process, it also strengthens the neural pathways making it more difficult to access new responses (Bauman, 2015). The theory emphasised the way people perceive the behaviour of others and make attributions about their motives (Warburton, Anderson, 2015:376). The hostile attributional bias, a reliable predictor of aggressive behaviour and a key construct in the *Social information processing* theory, explained the tendency to interpret ambiguous events (i.e. being bumped in a hall) as being motivated by hostile intent (Dodge, 1980).

Similarly, the *Script theory* emphasised the acquisition of scripts for personal behaviour (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 (Huessman, 1982; Warburton, Anderson, 2015:375). Huesmann and Eron (1984) hypothesised that social behaviour is to a great extent controlled by cognitive scripts that have been learned during an individual's early development. These cognitive scripts are stored in an individual's memory and used as guides for behaviour and social problem

solving- therefore, they must be encoded, rehearsed, stored, and retrieved (Huesmann & Eron, 1984). Scripts are learned through observation, reinforcement, and personal experience of situations in which aggression is an appropriate response. "*Once a script is retrieved, the child evaluates its appropriateness in light of existing internalised norms and also evaluates the likely consequences*" (Eron, 1994: 7). So, based on experience, the child can develop a script in which it becomes aggressive whenever it does not get what it wants (Beck, 2003). Usual risk factors for aggression do not need to be present because the child has learned to be aggressive, regardless of the situational elements. As the reinforcement of aggressive scripts continues, the child continues to engage in aggressive behaviour (Beck, 2003).

Bandura's *theory of moral disengagement* (2002, as cited in Bauman, 2015), assumes that people behave in ways that validate their self-worth and provide satisfaction- if they behave in ways contrary to their moral standards, the result could lead to negative self-evaluation. However, moral disengagement can avoid negative self-evaluation. This process involves the cognitive mechanisms by which the individual disengages his own moral standards using cognitive restructuring, minimising one's role, disregarding the harmful effects, and blaming the victim (Bandura, 2002, as cited in Bauman, 2015).

The *biological-physiological theories* emphasise the role of the brain, genes, biomarkers, neurotransmitters, and hormones in the development of aggressive behaviour (Baker, 1999; Pinna, Manchia, 2017). The pathogenesis of aggressive/violent behaviour is heterogeneous, as twin studies point to a substantial heritability of this trait with identified markers on chromosome 2p2 associated with aggressive behaviour in children. Furthermore, authors were able to confirm that a substantial proportion (10–54%) of phenotypic variation is explained by common genetic variants (Pinna, Manchia, 2017). A new trend in metabolomics is aiming to extensively profile the sets of small molecules within cells, tissues and biofluids, changes in gene expression (transcriptome) and the proteome, facilitating the identification of distinct biochemical signatures that could be tested as biomarkers for aggressive behaviour (Kell, 2014). Current studies link aggressive behaviour to genetic predispositions, hormones, malformation, or to the damage of brain structures and levels of cortical and nervous system arousal. Psychodynamic approaches and animal psychology have emphasised aggressive drives, while 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) (Warburton, Anderson, 2015:373). Brain structures whose (dis)function influences the onset of aggressive behaviour are the amygdala and other subcortical limbic structures, the nucleus accumbens, the anterior cingulate cortex, and the orbitofrontal cortex (Savić, Jukić, 2014). Pinna and Manchia (2017) reported that brain dysfunction may result in cognitive deficits and have an indirect effect on aggressive behaviour. Studies with functional Magnetic Resonance Imaging (MRI) have shown that amygdala responsivity appears to be increased in aggressive individuals. Indeed, compared with controls, non-medicated individuals with intermittent explosive disorder showed greater amygdala response to angry (vs neutral) facial expressions. Furthermore, amygdala activation to angry faces was correlated with the number of prior aggressive acts. At the same time, increased activity of the left amygdala was also observed in male borderline personality patients during anger induction and aggression phases (Pinna, Manchia, 2017). Baker (1999) gives examples of such cognitive deficits leading to school failure, dropout, or substance abuse, which may increase the tendency toward antisocial and aggressive behaviour. A dysfunction of genes that regulate different aspects of serotonergic and dopaminergic neurotransmission plays a role in the development of aggressive behaviour

(Savić, Jukić, 2014). Several neurotransmitters, their related enzymes and by-products after breakdown have demonstrated importance in human aggressive behaviour. The increase in aggressive behaviour has been related to high levels of dopamine and norepinephrine, and low levels of serotonin and monoamine oxidase (Baker, 1999). In most animal species, males are more aggressive than females, and the hormonal basis for this is shown by the fact that males are more aggressive during the mating period when the male hormones, testosterone and other androgens, are at their highest level (Beck, 2003). It is important to emphasise that these biological variables are not independent of one another but are highly interrelated (Baker, 1999). Also, the understanding of human aggressive behaviour cannot be achieved without understanding the interaction between biological and social factors, even when genetic studies provide ominously deterministic findings.

One of the empirically most supported biosocial-cognitive approaches, the *General Aggression Model* (GAM; Anderson & Bushman, 2002) is the most recent and broadest theory of aggression processes to date. GAM can explain the broadest range of aggressive behaviours, including those not based around aversive events or negative affect. Every instance of aggression involves a person, with all their characteristics (e.g. biology, genes, personality, attitudes, beliefs, behavioural scripts), responding to an environmental trigger such as a provocation, an aversive event, or an aggression-related cue. These features explain short- and long-term aggression across a range of forms and functions, including the three key dimensions: the degree of hostile/agitated affect; the degree of automaticity versus conscious thought; and the degree to which the goal is to harm the victim versus benefiting the perpetrator. The GAM takes a myriad of intrapersonal factors into account, with a range of possible triggers for aggression, known internal psychological processes, and the means by which behaviour is reinforced and learned (Warburton, Anderson, 2015:377).

Since no single theory of aggression can provide a satisfactory explanation of aggressive behaviour, integrative models such as Bronfenbrenner's *Ecological model of development* (1979) have emerged. According to his lifespan approach to development, aggressive behaviour is influenced by risk and protective factors that extend across several systems which surround and affect the individual. Risk factors are characteristics of an individual or the environment that increase the probability of aggressive behaviour, while protective ones diminish the effects of exposure to risk and reduce the likelihood of aggressive behaviour (Orpinas & Horne, 2005). The same variable can be both a risk and a protective factor, depending on which "side of the coin" is viewed (Lösel & Farrington, 2012). Bronfenbrenner had since evolved the Ecological systems theory into his bioecological model (Bronfenbrenner, Morris, 2006), highlighting the importance of understanding a person's development within environmental systems, and further explained that both the person and the environment affect one another bidirectionally. An individual interacts with different microsystem agents such as parents, siblings, and friends. The interaction is mutual, as the individual can influence microsystem agents, as well. Interactions between different microsystems form the mesosystem, the next layer also directly influencing the individual. There are even broader levels- the exosystem, which indirectly impacts the individual, and the highest level or the macrosystem, which consists of beliefs, ideologies, laws, and resources in a specific culture (Bronfenbrenner, Morris, 2006).

3. VIOLENCE AND AGGRESSIVE BEHAVIOUR RISK FACTORS ACROSS THE ECOLOGICAL SYSTEMS THEORY

3.1. Proximal influences at the personal level

One of the goals of the bioecological model aimed at predicting a pattern of associations among ecological, genetic, and cognitive variables as a function of proximal processes. Although aggressive behaviour has a considerable learned component, studies show that inherited characteristics account for perhaps a quarter to a third of an aggressive predisposition, with a dozen genetic markers linked to aggressive and antisocial behaviour (Tuvblad et al., 2009; Livazović, Bojčić, 2019; Warburton & Anderson, 2015). Genetic disorders represent a risk factor for the development of aggressive behaviour, as a dysfunction of genes that regulate serotonergic and dopaminergic neurotransmission leads to the development of aggressive behaviour (Savić, Jukić, 2014). A study by Mendes et al. (2009) concluded that the main genetic factors for aggressive behaviour were a low expression of the Monoamine Oxidase A (*warrior gene*) in the serotonin transporter gene, polymorphism in the dopamine receptor genes and the dopamine transporter gene. Kim-Cohen et al. (2006) claim the MAOA gene polymorphism seems to interact with the child's early environment so that aggression and antisocial behaviour are most likely in those who have this genetic trait and also experience childhood maltreatment. In their meta-analysis on correlates of youth violence in low- and middle-income countries, de Ribera et al. (2019) analysed 86 articles with a total sample of 480 898 individuals from 60 countries. Their findings support the notion that gender, age, personality traits and substance abuse all represent risk factors for aggression and violence perpetration.

Males have a higher tendency towards aggressive behaviour from early childhood throughout life, although women are as physically aggressive as men when strongly provoked (Bernat et al., 2012; Topitzes et al., 2012). Authors claim lower numbers of women engage in more severe forms of violence, as women tend to use more indirect, verbal, and relational aggression, with plausible explanations of sex differences ranging from different testosterone levels to socialisation roles among males and females. Preschool is a period in which clear gender differences in aggressive behaviour emerge, with more boys than girls displaying personal and physical aggression (Loeber & Stouthamer-Loeber, 1998). Therefore, age is also a significant factor, as aggressive children tend to become adolescents and adults who are more aggressive than their peers (Bushman and Huesmann, 2010).

From the perspective of personal traits, major studies emphasise factors related to impulsivity, lack of empathy, intelligence, temperament, neuroticism, and social skills. They all regulate an individual's response to provocation and victimisation. A meta-analysis by de Ribera et al. (2019) found that impulsivity is moderately associated with violence. Impulsivity is characterised by the lack of control over affect, behaviour, or cognition. People are less aggressive if they have greater control over their emotions, greater self-control, and a stronger capacity to inhibit their impulses (Warburton & Anderson, 2015). Lack of empathy, common mental disorders, legal and illegal substance use (tobacco, alcohol, illicit drugs) were all found to be risk factors for aggressive behaviour (de Ribera et al., 2019). For instance, substance abuse may lead to a diminishing ability to inhibit aggressive impulses. The *attribution theory* could explain the link between the lack of empathy and violence, but studies have shown empathy to be substantially genetically determined. Individuals lacking

empathy find it difficult to understand the other person's position, their feelings, and motives, so they are more likely to attribute the intention of causing frustration to the other person and answer with aggression.

Intelligence is an example of a combined factor, with above-average intelligence related to better executive neuropsychological functioning, resulting in better self-control or social information processing. So, it is not the abstract intellectual capacity that protects the individual against the development of aggressive behaviour, but more practical intelligence, social competence, and realistic planning (Lösel & Farrington, 2012). When considering the role of temperament as an individual habitual emotional response to a variety of circumstances, it is seen as congenital and hereditary; thus, genetic factors may influence the development of aggressive behaviour (Kandel Englander, 2003). A person's temperament could also be viewed as a combined factor, as Lösel & Farrington (2012) cite several studies showing that "easy" temperament serves as a protective factor in the development of aggressive behaviour. On the other hand, children with a "hard" temperament may affect their environment, so that those children who are difficult to parent may be exposed to a parenting style that causes or reinforces the development of violent behaviour (Kandel Englander, 2003). Unfortunately, all types of victimisation pose a risk factor for aggressive behaviour, especially for bullying victims (de Ribera et al., 2019). Experiencing maltreatment may cause several negative consequences including disruptions in relationships with adults, displaying dysregulated or disruptive behaviour in various settings, poor social skills development, all of them leading to aggressive behaviour (Topitzes et al. 2012).

Research on the 'Big Five' personality traits has generally found that people low in agreeableness and high in neuroticism are more aggressive and violent. Furthermore, both dimensions are associated with aggressive emotions, while low agreeableness is also associated with greater aggressive thinking (Barlett, Anderson, 2012; as cited in Warburton, Anderson, 2015). Finally, we emphasise the importance of social skills, a combined factor in the development of aggressive behaviour. Children with poor social skills are in a greater risk of developing aggressive behaviour because poor social skills may lead to antisocial peer affiliations later in life (O'Brien et al., 2013; Topitzes et al. 2012). In this perspective, perhaps the single greatest trigger for aggression is a provocation by another person, which does not need to be direct (Bettencourt et al., 2006; Warburton, Anderson, 2015). People can be provoked to aggression by social exclusion, having rumours spread about them and a range of other 'indirect' provocations, which renders promoting social skills and educational efforts essential.

3.2. Risk and protective factors for aggression and violence at the microsystem level

The microsystem represents the first layer of social influences on an individual, described as a pattern of activities, roles and interpersonal relations experienced by an individual in a given setting. The interaction and influence between the individual and different microsystem agents (parents, siblings, and friends) are mutual (Bronfenbrenner, Morris, 2006). Major studies found parenting styles, parental attachment, the family's socioeconomic status, children's school affiliation and climate, academic achievement, and peer impact to be the most critical factors for aggression and violence at this level. In a meta-analysis on associations

of parenting styles with externalising problem behaviours, which can manifest as aggression, Pinquart (2017) included 1435 studies and provided data on over a million children and adolescents. The study found that harsh control and psychological control in authoritarian, permissive and neglectful parenting styles were associated with higher levels of externalising problems. In their meta-analysis, de Ribera et al. (2019) also found that violence outcomes correlated with low parental supervision and general family dysfunction. Casas et al. (2006) cited several studies showing that authoritarian and permissive parenting is associated with aggressive behaviour in children. Permissive parents might unintentionally communicate that aggressive behaviour is acceptable by not punishing children when they act aggressively (Casas et al., 2006).

A meta-analysis by Pinquart (2017) found the parenting dimensions of warmth, behavioural control, autonomy granting and authoritative parenting style to be protective factors, as they are associated with lower levels of externalising problem behaviours, which declined over time. It should be noted that the initial levels of externalising problems predicted declines in parental warmth, behavioural control, and authoritative parenting, with increases in harsh control and psychological control. These results support the view that family factors not only impact the individual but are also influenced by the individual (Lösel & Farrington, 2012). Moreover, they are in line with Kandel & Englander's (2003) conclusion that children who are difficult to parent may be exposed to parenting styles that reinforce aggressive behaviour. Interestingly, Pinquart (2017) did not establish moderator effects of the child's gender on higher levels of externalising problems, concluding that higher levels of such problems in boys cannot be explained by differential effects of parenting, but rather by factors like testosterone levels or peer influence. Also, Pinquart (2017) found that many associations of parenting dimension and styles with externalising problems were stronger in adolescents than among children. This finding indicates that family remains an important socialisation agent during adolescence, regardless of the growing influence of peer groups. These stronger associations in adolescence may be due to the fact that externalising problem behaviours become more common in adolescence, so parents have greater needs for countering these behaviours. Adolescence is also when individuals start to critically question the decisions and behaviours of their parents and emancipate emotionally looking for more autonomy, as lack of autonomy granting may lead to adolescent aggression. Another important risk factor was related to the low parental attachment (de Ribera et al., 2019; Van Wert et al., 2017). According to Bowlby's *attachment theory*, the parent-child relationship develops with regard to the quality of early interactions between the parents and their child. If parents are not caring, loving and responsive, the child develops an insecure attachment pattern, which could entice the child's violent behaviour in discomforting situations as means of attracting parental attention (1969, as cited in Velki, 2012).

Lower family socioeconomic status poses a risk factor for aggressive behaviour, as it may lead to increased parental stress and family conflicts with aggressive parents (Lösel & Farrington, 2012; de Ribera et al., 2019). Consequently, physical punishment and positive parental attitudes toward aggressive behaviour, as well as parental conflicts, pose risk factors for the development of aggressive behaviour (O'Brien et al., 2013). Social learning theory suggests that violent parents help children model their aggressive behaviour by approving violent problem-solving, thus giving a bad example when trying to correct the child's behaviour through physical punishment or resolve marital disputes violently. It needs emphasising that the influence of family-related factors may be stronger for some children, depending on their

biological factors like genes and temperament, and broader environments like peer groups, schools, or neighbourhoods. Therefore, prevention programmes should encompass other socialising agents besides the family and the individual, with special focus on structured youth leisure time and meaningful extracurricular activities, which have shown great success with vulnerable groups.

3.3. Risk and protective factors for aggression and violence at the mesosystem level

Bronfenbrenner (1979) defined the mesosystem through relations between two or more microsystems, the likes of those between family, school, and peers. For instance, Hong & Espelage (2012) claim that teachers' involvement is a mesosystem factor for aggressive behaviour in school, as experiences of an individual in one microsystem (school) could affect the interactions in another (peers). They cited evidence from several studies on the protective roles of positive teacher involvement. By contributing to school culture, teachers influence students' relationships with their peers. The alliance between teachers and parents is the most significant support a child can receive, resulting in a higher quality of peer relations, academic outcomes, family relations, and personal/social development (Hong & Espelage, 2012). Like family factors, characteristics of schools are closely interrelated and mediate each other. In their meta-analysis, de Ribera et al. (2019) found that weak attachment to school and poor academic achievement positively correlated with violence (de Ribera et al., 2019). On the other hand, Jolliffe et al. (2016) found that a positive relationship toward school proved to be a protective factor, even with grade retention students. Authors indicate that good school relationships represent a protective factor for aggressive behaviour, beyond providing a setting for highly intelligent children to show their abilities while getting intrinsic and extrinsic rewards (Jolliffe et al., 2016). Both Barboza et al. (2009) and Lösel & Farrington (2012) indicated negative school climates as a risk factor. Given that a positive school climate includes norms, values and expectations that support people's sense of social, emotional and physical security, the absence of such climate and sense of security can be a source of frustration for the students, leading to anger, alienation and possible aggression.

Another example of a mesosystem structure would be the influence of family-life on a child's peer friend selection (Espelage, 2014). It has been hypothesised that parental monitoring is an important aspect influencing aggressive behaviour (Véronneau & Dishion, 2010). Parental monitoring is defined as the parents' effort to stay informed about the activities of their child outside the home. For students with low academic success, parental monitoring can enable learning by ensuring the stability of time and place (Morales et al., 2019). According to Garcia and Thornton (2014:1), current research shows that the involvement of the family in learning helps to improve student performance, reduce absenteeism, and restore parents' confidence in their children's education. Learners with parents or caregivers who engage in their education earn higher grades and test scores, have better social skills, fewer problems with crime and show improved behaviour.

As children grow up, family influences decrease while peer influences increase. Even though peer delinquency poses a significant risk factor for aggressive behaviour, it seems to vary based on the developmental timing of the violence assessment. Pardini et al. (2012) reported that high peer delinquency doubled the odds of serious violence involvement at age

14 but was unrelated to violence involvement in young adulthood. A study by Lansford et al. (2010) showed that peer rejection might lead to social information processing problems and aggressive behaviour. Aggressive behaviour later led to peer rejection, so peer rejection, social information processing problems and aggressive behaviour were both causes and consequences (Lansford et al., 2010). Even though sometimes behaving more prosocially can facilitate reinclusion, the dominant response to such rejection is to aggress, especially when the person can do so without significant social reprisals (Warburton, Anderson, 2015).

3.4. Distal factors for aggression and violence at the exosystem level

The exosystem contains several settings without active involvement in the process of developing the individual. Events occurring in the exosystem impact the microsystem and indirectly influence the changes in the individual within the microsystem. Still, the influence is reciprocal. Namely, the individual may initiate processes within the microsystem that may impact the exosystem (Bronfenbrenner, Morris, 2006). For example, exposure to community and neighbourhood violence increases the risk of developing aggressive behaviour among adolescent peers (O'Brien et al., 2013). According to social cognitive models, people who are exposed to a lot of violence, either virtual or real, will have an associative neural network with a lot of aggression-related knowledge structures, including aggressive behavioural scripts. The said is demonstrated by studies on people from violent environments, whether homes, neighbourhoods or war-torn countries, who had a higher predisposition towards aggression (Aguilar et al., 2000). The World Health Organization defines community violence as violence between unrelated individuals, who may or may not know each other, generally taking place outside the home (Krug et al., 2002). The *Social disorganisation theory* and the *Broken windows theory* argue that cues in the physical environment influence either trust or social control among community members (within the social environment), which then influences violence or delinquency (Mmari et al., 2014). For example, substance (stimulants, alcohol, methamphetamines) or weapons availability and use related to guns and liquor stores in the neighbourhood can increase aggressiveness 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; Warburton, Anderson, 2015).

According to the *Social disorganisation theory* by Shaw & Mckay, the structural characteristics of a neighbourhood disrupt the local community and family-level controls, which then increase the risk of adolescent aggressive behaviour in the neighbourhood (1969, as cited in Mmari et al., 2014). Wilson and Kelling (1982, as cited in Mmari et al., 2014) elaborate this further in their *Broken windows theory*, where unattended physical signs of disorder decrease community trust and increase further behavioural disorders including aggressive behaviour. In a meta-analysis on the effect of neighbourhood disadvantages and physical aggression in children and adolescents, Chang et al. (2016) supported the notion of neighbourhood disadvantages as risk factors for child and adolescent physical aggression, especially younger children. Sometimes, the effect of neighbourhood disadvantages on the development of aggressive behaviour among adolescents may be diminished, because of the existing negative impact of antisocial peer groups or substance abuse to which adolescents are more prone than younger children. On the other side, community factors such as support,

safety, police presence and cohesion represent protective factors in the development of aggressive behaviour (Van Wert et al., 2017). Lösel & Farrington (2012) concluded that, if associated with social cohesion and positive experiences, a low-income neighbourhood does not necessarily pose a risk factor.

When discussing the impact of media, there is an ongoing debate whether exposure to mass media leads to aggressive behaviour, with historical examples of media like the cinema, comics, radio, music, television and nowadays, video games. A meta-analysis of 48 health behaviour public campaigns reported that on average, 9 % more people exhibited a healthy form of behaviour following a media campaign than before (Snyder, Hamilton, 2002). Even though mass media campaigns have also been used to address violence, few studies have evaluated their effectiveness at reducing violence, though edutainment is showing promising results (WHO, 2009). However, numerous studies across all significant research methodologies found that violent media exposure increases the likelihood of aggressive behaviour and causes desensitisation to violence in both the short- and long-term (Warburton, 2014; Livazović, 2012). Besides, 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 behaviour (Anderson et al., 2003; Krahé et al., 2012; Warburton, Anderson, 2015). Still, there is a lack of consensus concerning the influence of the media's portrayal of violence on the development of such behaviour. The American Psychological Association's position is that media violence increases the risk of aggressive behaviour, as images of violent behaviour may send a message that it is socially acceptable. At the same time, viewers may become desensitised to violence (Orpinas & Horne, 2005). In their meta-analysis, Anderson et al. (2010) identified 74 studies and concluded that playing video games was associated with higher levels of aggressive behaviour. A study by Kühn et al. (2019) investigated the long-term effects of violent video games on behavioural measures of aggression, sexist attitudes, empathy and interpersonal competencies, impulsivity-related constructs, mental health, as well as executive control functions. Participants were divided into three groups (control/violent game/non-violent game) and tested before and after two months of playing a violent game (Grand Theft Auto V) and a non-violent game (The Sims 3). No significant changes in aggressive behaviour were observed in neither of the three groups. Studies by Ferguson & Kilburn (2010) and DeCamp (2015) showed that, when controlling for other risk factors (e.g. depression, family, peers), there is almost no influence of video games on aggressive behaviour. To paraphrase W. Schramm's famous quote, given the disagreements over the impact of the media, it can be concluded that the same media contents may have different effects on different recipients based on other risk and protective factors, depending on their individual traits, prior experience and the context in which they encountered the media content.

Another important factor is the parents' workplace, as it can indirectly affect the child's behaviour by supporting child-raising with different policies, like flexible work schedules, paid maternity leaves or parental leaves in case of the child's medical issues (Berk, 2015). Still, stress at the parents' workplace, family absenteeism caused by professional engagement, as well as the sheer workload may affect their relationship quality at home and indirectly impact the child's behaviour (Stacks, 2005). Therefore, interruptions in exosystemic activities may have a negative impact on the child's development, as families affected by unemployment or social isolation show increased levels of family conflict and child maltreatment. In these situations, extended family, as well as quality community support and services, become crucial mechanisms in providing social care and financial assistance (Berk, 2015).

3.5. Risk and protective factors for aggression and violence at the macrosystem level

The macrosystem represents the highest level of the Ecological systems theory, including factors such as norms, beliefs, ideologies, laws, and resources (Bronfenbrenner, 1979). The impact of the macrosystem on a developing individual is indirect, as events that occur on the broadest level affect lower levels of society. For example, diverse cultural and social norms support different types of violence. Traditional beliefs that men have a right to control or discipline women and children through physical means make women and children vulnerable to violence by intimate partners or parents and place them at risk of abuse. The *social norms* approach to health promotion assumes that people have mistaken perceptions about the attitudes and behaviour of others, as the prevalence of risky behaviour usually gets overestimated and protective tendencies, which could reinforce social tolerance, often underestimated. The *social norms* approach seeks to correct these misperceptions by giving people a more realistic sense of actual behavioural norms, thereby reducing problem behaviour. It has shown promising results when dealing with physical and sexual violence, as well as substance abuse (Berkowitz, 2005). In that aspect, legislation can be a decisive tool in changing behaviour and perceptions of cultural and social norms. For instance, studies show that since 1979, when Sweden introduced legislation to abolish all physical punishment of children by caregivers, public support for corporal punishment declined from 53 % in 1965 to 11 % in 1994 (Durrant, 2006). In comparison to Swedish children born in the 1950s, nearly all of whom have been struck by their mothers before the age of four, those born in the late 1980s had only 14 % physically abusive mothers. In contrast, by the late 1990s, only 11 % of the population was "positively inclined" towards even mild forms of physical punishment (Durrant, 2006). Similarly, governance and political systems can have protective roles in the development of aggressive behaviour by enforcing existing laws on violence and arresting or prosecuting violence offenders (Krug et al., 2002).

To emphasise the protective effects of individual, family, peer, and school factors in preventing aggressive behaviour, a multitude of agencies, institutions, and individuals must work together at the community level (Schmidt et al., 2003). For example, in 1982, a suicide committed by three 10 to 14-year-old boys as a result of peer bullying, triggered a chain of reactions leading to a nationwide campaign against bully/victim problems in Norwegian schools, launched by their Ministry of Education in 1983. The campaign against bullying resulted in intervention programmes that reduced the bully/victim problems in Norway by 50 % or more (Olweus, 1997). Therefore, cultural norms and engagement can have a protective influence on the amount of aggressive behaviour in society by describing the violence as an inappropriate method of conflict resolution, especially for young people who should learn and adopt values that support non-violent behaviour (Krug et al., 2002).

On the broadest of levels, wars and ethnopolitical violence pose significant risk factors in the development of aggressive behaviour. Studies on the influence of political conflicts in Kenya during 2007 showed that children's experiences of harm, parent harm, home destruction and death of a parent were related with the development of aggressive behaviour (Kithakye et al., 2010). The results of a study by Keresteš (2006) showed that Croatian children who had been exposed to a higher number of war stressors and traumas in preschool and early school years perceived themselves as more aggressive in early adolescence. It is possible that the ethnopolitical violence changed the quality of children's proximal environments (e.g. family,

school, peers, community, media), causing stress and insecurity, thus indirectly affecting their personal and social development, which led to aggressive behaviour. Natural disasters may also be a risk factor for aggressive behaviour. Since the outbreak of the COVID-19 pandemic in 2020, a dramatic increase from 30 - 40 % has been reported in recorded cases of violence against women and domestic violence, both worldwide and in the EU member states (Campbell, 2020). In America, a disruption of relocating to a new home after the major tornado in Minnesota was associated with higher levels of aggressive behaviour in adolescents aged 12 to 18 (Houlihan et al., 2008). For instance, policies to reduce the concentration of poverty in urban areas have resulted in a decrease in youth violence. In 1994, the U.S. Department of Housing and Urban Development's Moving to Opportunity experiment assigned a total of 638 families from high-poverty Baltimore neighbourhoods into three different treatment group (Ludwig et al., 2001). The experiment showed that enabling families to move into low-level poverty neighbourhoods decreased aggressive behaviour of adolescents, which could be linked to the prevailing higher social class and norms in these new surroundings. A meta-analysis by de Ribera et al. (2019) found that low- and middle-income countries share a number of correlates of youth violence with high-income countries. Six correlates concerning family structure showed no significant association to violence in low- and middle-income countries but were associated with violence in high-income countries. It is plausible that the influence of family structure depends on the social context, which is why it has a greater impact on internal family processes and children in high-income countries. The study also found that rates of interpersonal violence vary across low- and middle-income countries, being higher in Africa and Latin America than in Asia. The explanation may lie in the role of organised crime, drug trafficking and corruption in countries of Latin America and Africa (de Ribera et al., 2019). Future research in this area should have a greater focus on investigating the differences in cultural contexts, levels of corruption, criminal organisations, social disorganisation, weapon and drugs availability, as results still remain inconclusive due to various methodologies implemented and the number of pertinent factors included.

4. CONCLUSION

The relation between the strength and number of various risk and protective factors described in this paper could explain the likeliness of an individual's aggressive behaviour. The problem for researchers is that variations in risk factors they need to consider do complicate the process of understanding their interaction and a relative impact on an act of aggression or violence (Warburton, Anderson, 2015:379). Another issue is that actual violence is rarely used as an outcome measure, even where evaluations have been undertaken, as these often measure changes in attitudes and norms rather than violent behaviours. Given that no theory is able to explain the aetiology of violence fully, further research into this phenomenon is needed. Still, recent genetic, metabolomics and neuroscientific studies shed new promising light on its underlying mechanisms. Nevertheless, common genetic variants explaining and predicting violence and aggression show that most key risk factors influencing them do remain socially dependant. Integrative theories, such as the bioecological model, provide encouraging results when tackling the aetiology of aggressive behaviour, especially considering the ongoing *nature-nurture* debate. However, additional integrative studies are needed, especially at the higher levels of the model, to clarify the impact of more remote factors on individual

development. The knowledge of the impact of risk and protective factors would significantly improve the effectiveness of educational and community prevention strategies. Consequently, it would help in reducing the negative consequences of victimisation and perpetration of aggressive behaviour or violence.

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Sažetak

Goran Livazović, Karlo Bojčić

Preispitivanje "Paklene naranče": pregled teorija agresivnog ponašanja u okviru modela ekološkog sustava

Cilj je ovoga rada pružiti pregled glavnih teorija etiologije nasilja i agresivnog ponašanja iz perspektive Bronfenbrennerove teorije ekoloških sustava. Rad razmatra rezultate teorijskih i empirijskih istraživanja različitih rizičnih i zaštitnih čimbenika u etiologiji agresivnog ponašanja u kontekstu teorije ekoloških sustava; počevši od razine pojedinca (geni, osobine ličnosti), preko mikrosustava i mezosustava (obitelj, škola, vršnjaci), kroz egzosustav (zajednica, mediji, radno mjesto roditelja); do najšireg aspekta makrosustava (kultura, norme, politika, rat, prirodne katastrofe). Predstavljamo nalaze istraživanja iz najvažnijih bioloških, psiholoških i društvenih teorija o agresivnosti i nasilničkome ponašanju.

Ključne riječi: teorije agresivnosti, etiologija, teorija ekološkog sustava, nasilje, rizični i zaštitni čimbenici.