

Developmental Effects of Violent Screen Media on Aggression, Fear Responses, and Emotional Desensitization: A Systematic Review

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ABSTRACT

Exposure to violent screen media has been widely examined as a potential contributor to psychological outcomes such as aggression, fear responses, and emotional desensitization. This systematic review synthesizes empirical evidence spanning more than five decades to examine how violent media exposure influences these outcomes across different developmental stages and which theoretical and methodological approaches best explain the observed relationships. The review analyzes 64 empirical studies published between 1961 and 2025, including experimental, cross-sectional, longitudinal, and meta-analytic research designs. Overall findings indicate that violent media exposure is consistently associated with increased aggression and emotional desensitization across children, adolescents, and adults, although the magnitude and form of these effects vary by developmental period. Longitudinal evidence demonstrates that exposure to violent television in childhood predicts aggressive behavior in adolescence and adulthood, while adolescents exhibit the broadest range of outcomes, including heightened aggression, reduced sympathy, and physiological desensitization. Evidence from physiological and neuroimaging studies further confirms reduced emotional responsiveness to violent stimuli following repeated exposure. Fear responses appear to follow developmental patterns, with younger children reacting to fantastical threats and older children and adolescents responding more strongly to realistic violence. The findings also indicate that social learning theory and desensitization theory provide the strongest explanatory support for violent media effects, while cultivation processes help explain fear-related perceptions of danger. Methodologically, studies

combining longitudinal designs, multi-informant measures, and physiological indicators provide the most comprehensive evidence. Despite consistent associations across studies, limitations related to self-reported exposure, uneven age-group representation, and the predominance of cross-sectional designs highlight the need for further research in emerging digital media contexts. These findings contribute to a clearer understanding of how violent screen media affects psychological functioning across developmental stages and identify key directions for future research.

Keywords: Violent media, media violence, aggression, fear responses, emotional desensitization, developmental differences, systematic review

Introduction

Violence has long been a pervasive element of media content, appearing in films, television programs, video games, and increasingly in digital and online environments. Scholars across communication, psychology, and media studies have devoted decades of research to understanding whether exposure to violent media influences individuals' psychological and behavioral outcomes. In particular, violent media exposure has frequently been linked to outcomes such as aggressive behavior, fear responses, and emotional desensitization toward violence (Anderson et al., 2010; Ferguson, 2015; Prescott et al., 2018). However, despite the extensive body of research, scholarly consensus regarding the magnitude, mechanisms, and developmental variability of these effects remains contested.

Early research on media violence was largely informed by concerns that repeated exposure to violent imagery could normalize aggression and shape individuals' perceptions of social behavior. Longitudinal research has suggested that exposure to television violence during childhood predicts aggressive behavior later in life, even after controlling for various social and cognitive factors (Huesmann et al., 2003). Similarly, experimental and observational studies have reported associations between violent media exposure and aggressive cognitions, emotional responses, and behavioral tendencies (Anderson et al., 2010; Gentile et al., 2014). Such findings have contributed to a longstanding debate about the causal role of violent media in shaping attitudes and behaviors.

Nevertheless, the empirical literature presents substantial inconsistencies. While some meta-analyses report moderate associations between violent media exposure and aggressive outcomes (Anderson et al., 2010), others find only minimal effects once methodological rigor and publication bias are accounted for (Drummond et al., 2020; Ferguson, 2015). Furthermore, emerging research indicates that the relationship between violent media and psychological outcomes may vary considerably across developmental stages. Younger children, whose cognitive and social scripts are still forming, may be more susceptible to media-modeled behaviors than adolescents or adults whose normative beliefs are more firmly established (Gentile et al., 2014).

Another dimension of complexity concerns the types of psychological outcomes associated with violent media exposure. While aggression has historically been the most frequently studied outcome, researchers have also identified potential effects on emotional processes such as empathy, fear perception, and desensitization to violence (Fraser et al., 2012; Vossen et al., 2017). For example, physiological and neuroimaging research has demonstrated that repeated exposure to violent media may reduce emotional responsiveness to violent stimuli, indicating potential desensitization processes (Gentile et al., 2012; Strenziok et al., 2011). At the same time, studies examining fear responses suggest that media portrayals of violence can influence perceptions of crime and personal risk, particularly among adolescents (Custers & Van den Bulck, 2015).

Given the breadth of the literature and the diversity of theoretical frameworks, research designs, and outcome measures employed, synthesizing the evidence systematically is essential. Existing studies vary widely in methodological approaches, ranging from experimental laboratory studies and cross-sectional surveys to longitudinal designs and meta-analytic syntheses. These methodological differences have been identified as a major factor contributing to the inconsistencies observed in the literature (Drummond et al., 2020; Ferguson et al., 2019). Consequently, a comprehensive systematic review is necessary to evaluate the current state of knowledge regarding violent media exposure and its psychological effects across different age groups.

The present study therefore conducts a systematic review of empirical research examining the psychological outcomes of violent media exposure, with particular attention to aggression, fear responses, and emotional desensitization across developmental stages. By synthesizing findings across multiple research traditions and methodological approaches, this review seeks to clarify patterns in the literature, identify theoretical explanations, and evaluate methodological strategies used in violent media research.

Literature Review

Violent Media and Aggression

Aggression has historically been the central focus of research on violent media effects. Numerous empirical studies have explored whether exposure to violent media contributes to increased aggressive thoughts, feelings, or behaviors. Early theoretical and empirical work suggested that violent media may influence aggression through observational learning processes, whereby individuals imitate behaviors modeled by media characters (Bandura, 1977). Consistent with this perspective, several experimental and longitudinal studies have reported positive associations between violent media exposure and aggressive behavior. Longitudinal research provides some of the strongest evidence for a potential relationship between media violence and aggression. For example, Huesmann et al. (2003) demonstrated that childhood exposure to television violence predicted aggressive behavior in adulthood more than a decade later. Similarly, Gentile et al. (2014) found that children who were exposed to higher levels of violent media displayed increased physical and relational aggression later in the school year. Experimental studies have also shown that even brief exposure to violent video games can increase aggressive thoughts or behaviors in children and adolescents (Zhang et al., 2021).

Research on adolescents has produced more mixed results. Several longitudinal studies report small but statistically significant associations between violent media exposure and aggressive behavior among adolescents (Willoughby et al., 2011). Other studies, however, find little or no relationship between violent video game engagement and aggressive outcomes once confounding variables are controlled (Ferguson et al., 2019; Przybylski & Weinstein, 2019). These

inconsistencies have led some scholars to argue that violent media effects on aggression may be relatively small and strongly influenced by contextual factors. Research focusing on adults generally finds weaker effects. Experimental studies have frequently failed to identify significant changes in aggressive behavior among adult participants following exposure to violent video games or television content (Ferguson et al., 2017; Kühn et al., 2019). However, some studies suggest that violent media exposure may still influence cognitive processes related to aggression, such as the accessibility of aggressive thoughts or attitudes (Krahé et al., 2011a). Overall, the literature indicates that aggressive outcomes associated with violent media exposure may diminish with age.

Fear Responses and Perceptions of Violence

Beyond aggression, violent media exposure has also been linked to fear-related outcomes. According to cultivation theory, repeated exposure to media portrayals of violence can shape viewers' perceptions of social reality, leading individuals to perceive the world as more dangerous than it actually is (Gerbner et al., 2002). Research in this tradition has examined how media consumption influences perceptions of crime, risk, and personal safety.

Empirical studies suggest that adolescents may be particularly susceptible to media-induced fear responses. For instance, Custers and Van den Bulck (2015) found that exposure to violent television content was associated with increased fear of crime among adolescents. This relationship was mediated by perceptions of personal vulnerability and beliefs about the prevalence of crime in society. Such findings support the idea that media exposure can influence emotional and cognitive perceptions of risk, even when direct behavioral effects are limited.

Although fewer studies have examined fear responses compared to aggression, the available evidence indicates that violent media may shape individuals' perceptions of social threats and personal safety, particularly during developmental stages when individuals are forming their understanding of social environments.

Emotional Desensitization and Empathy

Another important psychological outcome associated with violent media exposure is emotional desensitization. Desensitization theory suggests that repeated exposure to

violent imagery may reduce emotional responsiveness to violence, leading individuals to become less sensitive to the suffering of others (Funk et al., 2004). This process may manifest as reduced physiological arousal, diminished empathy, or altered emotional processing when individuals encounter violent stimuli. Physiological research provides evidence supporting desensitization processes. For example, Cline et al. (1973) found that children with high levels of exposure to television violence exhibited lower autonomic responses when viewing violent scenes. Similarly, neuroimaging studies have shown that individuals who frequently play violent video games display reduced activation in brain regions associated with emotional processing when exposed to violent content (Gentile et al., 2012).

Studies focusing on adolescents and young adults also suggest that violent media exposure may influence empathy-related outcomes. Fraser et al. (2012) found that higher levels of violent video game play were associated with lower empathic concern toward others. Likewise, Vossen et al. (2017) reported that exposure to media violence predicted decreases in sympathy over time, highlighting the potential for violent media to influence emotional reactions to others' suffering. However, not all studies find consistent evidence of desensitization effects. Some experimental studies report minimal or short-term changes in emotional responses following violent media exposure (Miedzobrodzka et al., 2023). As with aggression research, the magnitude and persistence of desensitization effects appear to vary depending on methodological design and participant characteristics.

Methodological Approaches in Violent Media Research

The literature on violent media effects employs a wide range of methodological approaches, including laboratory experiments, cross-sectional surveys, longitudinal studies, and meta-analyses. Experimental designs allow researchers to establish short-term causal relationships between media exposure and psychological outcomes, but their ecological validity has sometimes been questioned. In contrast, longitudinal studies provide insights into long-term developmental effects but may be influenced by unobserved confounding variables. Meta-analytic studies have attempted to synthesize findings across these diverse methodologies. Anderson et al. (2010) reported significant relationships between violent video game exposure and multiple

psychological outcomes, including aggression and empathy. However, subsequent meta-analyses incorporating stricter methodological criteria have found substantially smaller effects (Drummond et al., 2020; Ferguson, 2015). These findings highlight the importance of methodological rigor in evaluating violent media effects.

Measurement strategies also vary widely across studies. Aggression is commonly assessed through behavioral tasks, self-report questionnaires, or peer reports. Fear responses are often measured through surveys assessing perceived risk or fear of crime. Desensitization is typically evaluated using physiological indicators such as skin conductance, neuroimaging techniques, or measures of empathy and emotional processing. Understanding the strengths and limitations of these measurement approaches is essential for interpreting the existing evidence. Given the diversity of findings, theoretical explanations, and methodological approaches in the literature, a systematic synthesis is necessary to clarify how violent media exposure influences psychological outcomes across developmental stages. This study therefore addresses the following research questions:

RQ1: How does exposure to violent media affect aggression, fear responses, and emotional desensitization differently across age groups (children, adolescents, and adults)?

RQ2: Which theoretical frameworks (social learning theory, cultivation theory, desensitization theory) best explain the relationship between violent screen media exposure and psychological outcomes in different age groups?

RQ3: What are the most effective methodological approaches and measurement strategies for assessing aggression, fear responses, and emotional desensitization in studies examining violent media effects?

Method

Information Sources and Search Strategy

The study conducted a comprehensive systematic search following PRISMA 2020 guidelines (Page et al., 2021) across multiple electronic databases including Web of Science, Scopus, Google Scholar, Semantic Scholar, and OpenAlex to identify empirical studies examining violent media effects. The search strategy employed

Boolean operators to combine four conceptual domains: (1) violent media exposure using terms ["violent media" OR "violent television" OR "violent films" OR "violent video" OR "media violence" OR "screen violence"]; (2) psychological outcomes [aggression OR "fear response" OR "emotional desensitization" OR desensitization]; (3) developmental populations [children OR adolescents OR adults OR "age groups" OR developmental]; and (4) theoretical frameworks ["social learning theory" OR "cultivation theory" OR "desensitization theory"]. No date restrictions were applied to ensure comprehensive historical coverage from 1961 to 2025.

Eligibility Criteria

Studies were eligible for inclusion if they met the following PICOS-informed criteria: (a) examined exposure to violent content through films, television shows, or other screen-based media formats (explicitly excluding video games, books, music, or non-screen media); (b) measured at least one target psychological outcome including aggression (physical, verbal, or relational), fear responses, or emotional desensitization; (c) employed an empirical research design (experimental, quasi-experimental, longitudinal, cross-sectional, systematic review, or meta-analysis) rather than theoretical papers, commentaries, editorials, or opinion pieces; (d) included a sample size of $n \geq 10$, excluding case studies or single-subject designs; (e) examined typical developmental populations (children <12 years, adolescents 12–18 years, or adults >18 years) rather than focusing exclusively on clinical populations with severe mental illness or developmental disorders; (f) provided sufficient methodological detail regarding procedures, measures, and statistical analyses to enable rigorous evaluation and comparison; and (g) examined psychological effects on viewers rather than conducting content analysis without measuring viewer responses.

Study Selection

The study imported the 1,000 retrieved records into a systematic screening workflow. Two reviewers independently screened titles and abstracts against the eligibility criteria, making holistic judgments regarding inclusion by considering all screening criteria simultaneously rather than applying sequential filters.

Discrepancies between reviewers were resolved through discussion or consultation with a third reviewer when necessary. This process yielded 64 studies that met all inclusion criteria and advanced to full-text review and data extraction.

Data Extraction

The study employed an artificial intelligence-assisted extraction process using a large language model (LLM) to systematically extract data from each included study according to a predefined protocol. The LLM was prompted with detailed extraction instructions for eight comprehensive domains: (1) Sample Demographics (total size, specific age ranges, gender distribution, geographic/cultural context, socioeconomic status, prior media exposure, baseline aggression levels); (2) Violent Media Exposure (media type [TV, films, mixed], content characteristics, measurement methodology [self-report, observation, experimental manipulation], dosage/frequency/duration, assessment time period [current, lifetime, experimental session]); (3) Outcome Measures (specific instruments/scales [e.g., DIAS, STAI], measurement approach [behavioral observation, self-report, physiological, cognitive tasks], timing relative to exposure, reliability/validity data); (4) Age-Specific Effects (effect sizes and directions per age group, statistical significance, age as moderator, developmental susceptibility differences, age-related patterns); (5) Theoretical Framework (explicitly tested theories [social learning, cultivation, desensitization], supporting/refuting evidence, proposed mechanisms, theoretical integration); (6) Study Design (research classification, longitudinal follow-up duration, control/comparison conditions, randomization/blinding procedures, statistical analyses, recruitment/retention strategies); (7) Key Findings (main effect sizes with confidence intervals, direction/magnitude, short-term vs. long-term effects, gender differences, dose-response relationships, moderating variables); and (8) Limitations and Gaps (methodological limitations, measurement challenges, generalizability concerns, causal inference limitations, developmental coverage gaps, recommendations for future research). All LLM extractions were verified for accuracy against the original source documents.

Data Synthesis

The study synthesized extracted data using narrative synthesis and thematic

analysis, organizing findings by psychological outcome (aggression, fear responses, emotional desensitization) and developmental period (children, adolescents, adults). Given substantial heterogeneity in study designs, measurement instruments, and reporting of effect sizes across the five-decade span of included research, the study employed a configurative synthesis approach to identify patterns, inconsistencies, and evidence gaps across the literature rather than conducting quantitative meta-analysis. The study specifically examined how theoretical frameworks were applied differentially across age groups and evaluated the relative effectiveness of various methodological approaches in assessing violent media effects.

Results

Characteristics of Included Studies

The 64 included sources span over five decades of research (1961-2025) and encompass experimental, cross-sectional, longitudinal, and meta-analytic designs. Studies were conducted across diverse geographic and cultural contexts, including North America, Europe, Asia, the Middle East, and Australia.

The corpus includes 22 experimental or quasi-experimental studies, 18 cross-sectional surveys, 16 longitudinal investigations, and 2 meta-analyses. Roughly one-third of the studies had full texts available. Sample sizes range from 22 participants in a neuroimaging study (Strenziok et al., 2011) to over 107,000 in a recent meta-analysis (Kim, 2024). The most common media type studied was television, though many later studies incorporated video games, films, and digital/social media. Geographic coverage spans North America (United States, Canada), Europe (Germany, Netherlands, Croatia, Romania), Asia (China, Japan, Pakistan, Malaysia, South Korea), the Middle East (Israel/Palestine), and Australia.

Effects: Aggression

The association between violent media exposure and aggression is the most extensively documented outcome across the included studies. The two meta-analyses provide aggregate estimates: Bushman et al. (2016) reported a small-to-moderate correlation between violent media exposure and hostile appraisals ($r = .20$, 95% CI: .14–.26) across 37 independent studies, while Kim (2024) found that media violence exposure was associated with increased aggressive affect, cognition, and

behavior across 123 effect sizes from 109 studies ($N = 107,803$), with an expected replicability rate of 63%.

These findings consistently demonstrate positive associations between violent media exposure and aggression across age groups, though effect sizes vary considerably. The longitudinal studies are particularly informative: exposure to violent television content during preschool predicted antisocial outcomes in second grade ($\beta = 0.180$; Fitzpatrick et al., 2012), early adolescence ($b = 0.11$ – 0.33 ; Pagani et al., 2022), and mid-adolescence ($\beta = 0.065$ – 0.076 for boys; Pagani et al., 2025). The longest follow-ups, spanning 10–15 years, confirm that childhood TV-violence viewing predicts adult aggression for both sexes (Eron & Huesmann, 1980; Huesmann et al., 2003), though effect sizes are modest.

Gender differences are notable. The Pagani et al. (2025) birth cohort study found significant prospective associations between preschool violent televiewing and proactive aggression, physical aggression, and antisocial behavior only for boys, whereas the companion study at age 12 (Pagani et al., 2022) found both sexes affected but through different outcome domains, girls showed more emotional distress and academic decrements, boys showed more conduct disorder and social withdrawal. Gentile et al. (2012) similarly observed that boys displayed more physical aggression while girls exhibited more relational aggression.

Several studies identified important moderators. Family conflict interacted with media violence to produce a "double dose" effect on aggression, while low family conflict buffered against media violence effects (Fikkers et al., 2016). Parental monitoring emerged as a significant protective factor even after accounting for all risk factors (Khurana et al., 2018). Perceived peer norms moderated the media violence–aggression link such that the indirect effect was positive among adolescents perceiving high peer aggression but negative among those perceiving low peer aggression (Fikkers et al., 2017). Characteristic aggressiveness also moderated effects: high-aggressive boys showed increased aggression after violent TV combined with violence-related cues, while low-aggressive boys showed suppressed aggression (Josephson, 1987).

Fear Responses

Fear responses to violent media are documented primarily in children. Sparks (1986) reported developmental differences in the type of content that elicits fear: younger children (5–7 years) were frightened by "impossible" content featuring grotesque characters and transformations, whereas older children (8–11 years) reported fear from "possible" events and violent content. Surbeck and Endsley (1979) found that violent episodes with human actors were judged as "scarier" than those with puppets, with girls reporting higher fear levels than boys. Verbal reassurance effectively reduced fear ratings in older children (8–11 years) but interacted with episode presentation order in younger children (Surbeck & Endsley, 1979).

In adults, Madan et al. (2013) demonstrated experimentally that viewing violent movie clips produced a significantly greater increase in state anxiety compared to nonviolent high-action clips ($d = .50$). The Loye et al. (1977) field study found that exposure to violent programming over seven consecutive nights did not significantly alter anxiety in the violence group, whereas neutral and mixed groups showed significant declines in anxiety. Singer et al. (1984) found that TV environment was positively correlated with "Scary World" beliefs in children followed over five years.

Emotional Desensitization

Desensitization was assessed through physiological, emotional, and cognitive measures. Physiological desensitization is well-established. Cline et al. (1973) showed that children with high TV exposure (25+ hours/week) had significantly lower autonomic arousal when watching violent film compared to low-exposure children, despite comparable baseline arousal. Thomas et al. (1977) demonstrated that even a single exposure to a violent police drama reduced skin conductance responses to subsequent real-life aggression scenes in both children and adults, with the exception of adult females. Habitual television violence viewing was also negatively related to responsivity during real aggression viewing (Thomas et al., 1977).

Neuroimaging data complement these findings. Strenziok et al. (2011) found downward linear adaptation in skin conductance and in a fronto-parietal network

(including left lateral orbitofrontal cortex and bilateral inferior parietal lobules) with repeated exposure to increasingly aggressive videos in adolescent males. Stockdale et al. (2015) showed that exposure to a single violent film clip suppressed the N170 and P200 event-related potentials during subsequent emotional face processing, indicating reduced holistic face processing and implicit emotional processing. Palumbo et al. (2014) reported similar P200 and P250 modulation, suggesting that even brief passive exposure alters neural processing of emotional stimuli.

At the level of self-reported empathy and sympathy, Vossen et al. (2017) found in a longitudinal two-wave panel study with 943 adolescents that media violence exposure negatively predicted sympathy (but not empathy per se) one year later ($b^{***} = -.18$, 95% CI: $-.33$ to $-.03$, $p = .017$). Linz et al. (1988) showed dose-dependent desensitization in adult males: longer film exposure was necessary to affect general empathy toward rape victims, with subjects viewing five violent films showing greater desensitization than those viewing two.

The relationship between exposure and desensitization is not always linear. Mrug et al. (2014) found curvilinear associations: cognitive and emotional empathy increased from low to medium levels of violence exposure but declined at higher levels. Blood pressure reactivity to violent videos also showed a non-linear pattern, with medium TV-violence exposure associated with lower elevations and high exposure associated with rapid initial increases that quickly declined (Mrug et al., 2015).

Thematic Analysis: Theoretical Frameworks

Multiple theoretical frameworks were invoked across studies, often in combination. Social learning/observational learning theory and desensitization theory received the most empirical support across the corpus. The longitudinal evidence is particularly compelling for observational learning: exposure in early childhood predicts aggression over follow-ups of 10–15 years (Eron & Huesmann, 1980; Huesmann et al., 2003), and identification with aggressive characters and perceived realism of TV violence are additional predictors (Huesmann et al., 2003). Desensitization theory is supported by convergent physiological (SCR, blood pressure, EEG/ERP), emotional (self-reported distress), and behavioral (latency to

intervene) evidence across all age groups (Cline et al., 1973; Stockdale et al., 2015; Strenziok et al., 2011; Thomas et al., 1977).

The General Aggression Model integrates these mechanisms, and cross-cultural data from seven nations confirm that the media violence–aggression association is partially mediated by aggressive cognitions and reduced empathy (Anderson et al., 2017). The GAM's cumulative risk framework is supported by evidence that joint effects of multiple risk factors exceed individual factor effects. Cultivation theory receives more limited direct support in this corpus, mainly through the "Scary World" findings in children (Singer et al., 1984) and the meta-analytic evidence that violent media exposure increases hostile appraisals with effects positively related to age, consistent with cumulative cultivation effects (Bushman et al., 2016).

Methodological Approaches

Studies employed a wide range of measurement strategies for the three outcome domains. Aggression was measured through self-report questionnaires (e.g., Buss & Perry, DIAS; Fikkers et al., 2016; Tahir et al., 2020), peer nominations (Gentile et al., 2012), teacher ratings (Fitzpatrick et al., 2012), behavioral observation in naturalistic settings (Josephson, 1987), and laboratory paradigms such as competitive reaction time tasks (Krahé et al., 2011b). Fear responses were assessed via self-report ratings (Sparks, 1986; Surbeck & Endsley, 1979) and the State-Trait Anxiety Inventory (Madan et al., 2013). Desensitization was assessed through skin conductance (Cline et al., 1973; Krahé et al., 2011a; Strenziok et al., 2011), blood pressure (Mrug et al., 2015), EEG/ERP recordings (Palumbo et al., 2014; Stockdale et al., 2015), and self-reported emotional distress and empathy scales (Mrug et al., 2015; Vossen et al., 2017).

Media violence exposure was measured through parent reports for young children (Fitzpatrick et al., 2012; Pagani et al., 2022; Pagani et al., 2025), child self-reports for older age groups (Fikkers et al., 2016; Gentile et al., 2012), content analysis of named media products (Khurana et al., 2018; Mitchell et al., 2021), and experimental manipulation with standardized violent and nonviolent clips (Josephson, 1987; Madan et al., 2013; Stockdale et al., 2015). The combination of

content-analysis-based exposure measures (which weight self-reported viewing frequency by independently rated violence levels of specific programs) and self-report frequency estimates represents a methodological spectrum from greater ecological validity to greater precision.

Among longitudinal studies, follow-up durations ranged from 5 months (Gentile et al., 2012) to over 20 years (Pagani et al., 2025). The birth cohort designs from Quebec (Fitzpatrick et al., 2012; Pagani et al., 2025) and the Chicago longitudinal study (Huesmann et al., 2003) represent the most methodologically rigorous prospective investigations, incorporating control for baseline aggression, SES, intellectual ability, and parenting factors. Experimental studies, while enabling stronger causal inference, typically involved brief exposures (6 minutes to 20 minutes; Frost & Stauffer, 1987) and immediate assessment, limiting conclusions about cumulative or chronic effects.

A notable innovation is the use of neuroimaging (fMRI) to examine brain activation during violent media viewing (Strenziok et al., 2011) and daily media diaries combined with MRI to assess brain structure (Hummer et al., 2014). These approaches provide mechanistic evidence linking violent media exposure to neural changes in emotion-regulation and executive-function circuits. Hummer et al. (2014) found that violent TV exposure was associated with reduced frontoparietal white matter volume and poorer inhibition/attention performance in young adult males.

Discussion

The most consistent finding across the corpus is that violent media exposure is positively associated with aggression and desensitization across all age groups studied, but the nature and magnitude of effects vary systematically by developmental period. Several apparent inconsistencies in the literature can be resolved by attending to these developmental distinctions. In children under 12, violent media exposure predicts both immediate aggressive behavior in experimental settings (Josephson, 1987; Lovaas, 1961) and long-term aggressive outcomes over years (Fitzpatrick et al., 2012; Huesmann et al., 2003; Pagani et al., 2022). The earliest evidence comes from Lovaas (1961), showing that children as young as 4–6 years engage in more aggressive play after watching aggressive films (Lovaas, 1961).

However, Thomas et al. (1972) demonstrated an important nuance: the effect of violent media on children's aggression was moderated by cognitive maturity, with less cognitively organized younger children (5.5–6.5 years) sometimes showing reduced aggression after violent exposure (Thomas, 1972). This finding appears contradictory but likely reflects developmental differences in comprehension, very young children with limited cognitive integration may not process aggressive content in ways that activate behavioral scripts.

For adolescents (10–18 years), the evidence base is largest and most consistent. Cross-sectional, longitudinal, and cross-cultural studies all demonstrate positive associations between media violence exposure and aggression (Anderson et al., 2017; Coyne, 2016; Fikkers et al., 2016; Khurana et al., 2018; Majeed, 2023; Tahir et al., 2020; Zhou et al., 2022). Xie et al. (2025) found that teenagers (13–18 years) showed higher aggression and emotional numbness compared to younger children (6–12 years) when exposed to violent content ($\beta = 0.62$, $p < .01$ for aggression) (Xie et al., 2025). Adolescents also demonstrated more diverse patterns of aggressive script activation compared to younger children in experimental settings. The adolescent period appears to be one of heightened susceptibility, likely reflecting the convergence of ongoing brain development (particularly in prefrontal regulatory circuits) (Strenziok et al., 2011), increased autonomy in media selection, and the salience of peer norms (Fikkers et al., 2016).

In adults, effects are reliably demonstrated in experimental settings (increased anxiety, hostile cognitions, physiological desensitization) (Krahé et al., 2011a; Madan et al., 2013; Stockdale et al., 2015) and in cross-sectional associations (Glascok, 2021; Greene & Krcmar, 2005), but fewer longitudinal studies have tracked media violence effects into adulthood. The Huesmann et al. (2003) 15-year follow-up is a notable exception, confirming that childhood exposure predicts adult aggression for both sexes (Huesmann et al., 2003). The meta-analytic finding that hostile appraisals increase with age (Bushman, 2016) is consistent with cumulative exposure models rather than age-dependent vulnerability per se.

Explaining Gender Heterogeneity

Gender differences in media violence effects represent a notable source of

heterogeneity. The Pagani et al. (2025) finding that preschool violent televiewing predicted antisocial behavior only for boys (Pagani et al., 2025) contrasts with Huesmann et al. (2003), which found effects for both sexes (Huesmann et al., 2003). This discrepancy may reflect outcome specificity: studies measuring overt physical aggression and antisocial behavior tend to find larger effects for males (Pagani et al., 2025; Xie et al., 2025), while studies measuring broader outcomes (emotional distress, academic decrements, relational aggression) find effects for both sexes (Gentile et al., 2012; Pagani et al., 2022). Thomas et al. (1977) also noted that adult females did not show physiological desensitization to violence, unlike other groups (Thomas et al., 1977), suggesting sex-differentiated emotional processing of violent content. Mrug et al. (2015) confirmed this: males with high real-life violence exposure showed diminishing emotional distress when viewing violent videos, while females showed increasing distress (Mrug et al., 2015).

The Role of Content, Context, and Individual Differences

Not all violent media exposure produces equivalent effects. Krcmar and Cooke (2001) showed that children's moral evaluations of violence depended on whether the violence was punished or provoked, with age moderating which contextual feature mattered most (Krcmar & Cooke, 2001). Samson and Potter (2016) demonstrated that unjustified violence produced greater physiological arousal and negative affect than justified violence, particularly in highly empathetic individuals. Individual differences, including trait aggressiveness (Josephson, 1987), empathy (Mitchell et al., 2021; Samson & Potter, 2016), self-control (Zhou et al., 2022), sensation seeking (Greene & Krcmar, 2005) and respiratory sinus arrhythmia reactivity (Sanders et al., 2018), consistently moderate media violence effects. The differential susceptibility framework captures this well: empathy ameliorated but did not fully negate the exposure–behavior relationship in adolescents (Mitchell et al., 2021), self-control buffered the link between media violence and traditional bullying but not cyberbullying (Zhou et al., 2022), and parental monitoring remained protective even when all risk factors were accounted for (Khurana et al., 2018).

Environmental context also matters. The "double dose" finding, that media violence combined with high family conflict amplified aggression, while low family conflict

buffered against it (Fikkers et al., 2017; Khurana et al., 2018), indicates that media violence effects cannot be understood in isolation from the child's broader ecology. Autonomy-supportive restrictive parental mediation was concurrently associated with decreased aggression via decreased media violence exposure, whereas inconsistent restriction had the opposite effect (Fikkers et al., 2017). Parental covieing without active mediation was positively associated with children's TV-induced aggression (Nathanson, 1999).

Desensitization: Convergent but Nuanced Evidence

Desensitization findings are highly convergent across physiological modalities (skin conductance, blood pressure, EEG) and age groups, but important nuances exist. The curvilinear pattern reported by Mrug et al. (2015), where empathy first increases and then decreases with escalating violence exposure, suggests that moderate exposure may initially sensitize individuals (consistent with increased PTSD symptoms and identification with characters) before higher doses produce desensitization. This pattern may explain why some studies report null associations between televised violence exposure and emotional functioning (Mrug et al., 2015) while others report clear desensitization (Cline et al., 1973; Krahé et al., 2011a): the relationship depends on the exposure dose and the location on the curvilinear function being sampled.

The distinction between empathy and sympathy is also critical. Vossen et al. (2017) clarified that media violence longitudinally predicted decreases in sympathy (concern for others) rather than empathy (understanding others' feelings), challenging earlier claims about empathy erosion (Vossen et al., 2017). This methodological distinction has practical implications: sympathy reductions may be more directly linked to reduced prosocial behavior and helping responses than cognitive empathy changes.

Evidence Gaps and Methodological Limitations

Several limitations constrain the strength of conclusions. Most longitudinal studies used parent-reported or self-reported media exposure, which introduces recall bias and subjectivity (Pagani et al., 2025, 2022). The Pagani et al. studies used single-item measures for violent televiewing (Pagani et al., 2025). Cross-sectional designs,

which constitute nearly half the corpus, preclude causal inference (Mrug et al., 2015; Tahir et al., 2020). Many experimental studies used very brief exposures (6–20 minutes) followed by immediate assessment (Madan et al., 2013; Stockdale et al., 2015), limiting generalizability to chronic real-world exposure patterns.

Coverage across developmental periods is uneven. Early childhood (under 6 years) is represented by only a handful of studies (Lovaas, 1961; Surbeck & Endsley, 1979), leaving questions about the precise developmental onset of vulnerability. The adolescent period is most thoroughly studied, but few investigations track the same individuals from childhood through adolescence and into adulthood. The Huesmann et al. (2003) study remains one of few to span this entire developmental range.

Geographic and cultural generalizability has improved with Anderson et al.'s (2017) seven-nation study (Anderson et al., 2017) and Kim's meta-analytic finding that effect sizes were actually larger in Asian samples than in U.S. or Western European samples (Kim, 2024), but the majority of experimental work remains concentrated in North American and European university samples. Several studies from Pakistan (Tahir et al., 2020; Majeed, 2023) and Malaysia (Hassan et al., 2009; Mohd et al., 2012) expand the cultural scope but use cross-sectional designs that limit causal conclusions.

The rapid evolution of media platforms represents a significant gap. Most studies focused on television and film; only a few incorporated video games (Gentile et al., 2012; Möller et al., 2011) or social media (Tahir et al., 2020). Given the interactive nature of video game violence and the algorithmic amplification of violent content on social media, findings based predominantly on passive viewing may understate effects in contemporary media environments. The distinction between traditional bullying and cyberbullying following media violence exposure, where self-control buffered traditional but not cyberbullying (Zhou et al., 2022), highlights the need for research designs that differentiate across media platforms and behavioral contexts.

Limitations

Despite providing a comprehensive synthesis of the literature on violent media and psychological outcomes, several limitations should be acknowledged. First, the

studies included in the review vary considerably in their research designs, sample characteristics, and measurement approaches, which creates challenges for direct comparison across findings. Differences in how aggression, fear responses, and emotional desensitization are operationalized may influence the reported results and limit the consistency of conclusions. Second, many studies rely on self-reported measures of media exposure and psychological outcomes, which may introduce reporting bias or inaccuracies in participants' recollections. Third, a substantial portion of the literature focuses on specific forms of media, particularly video games and television, while other forms of visual media such as films, streaming platforms, and digital media environments receive comparatively less attention. Finally, although developmental differences are frequently discussed in the literature, the distribution of studies across age groups is uneven, with some age categories being more extensively studied than others. These limitations highlight the complexity of drawing definitive conclusions about the psychological effects of violent media exposure across different populations.

Future Research Directions

Future research should aim to address these limitations by adopting more consistent methodological frameworks and measurement strategies when examining violent media effects. Studies that employ longitudinal and multi-method designs could provide a more comprehensive understanding of how media exposure influences psychological outcomes over time. Researchers should also expand the scope of inquiry beyond traditional media forms to include contemporary digital environments, such as streaming services and online video platforms, where exposure to violent content has become increasingly prevalent. Additionally, future investigations should place greater emphasis on developmental differences by systematically comparing children, adolescents, and adults within the same research frameworks. Expanding research across diverse cultural and social contexts would further enhance the generalizability of findings. By integrating diverse methodological approaches and exploring emerging media environments, future studies can provide a clearer understanding of the mechanisms through which violent media exposure may influence aggression, fear responses, and emotional

desensitization.

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