

Moral desensitization in the digital age: A synthesis of theory, empirical evidence, and implications (a narrative review)

Ahmad Irfan Muzni^{1*}, Latipun¹, and Muhammad Salis Yuniardi¹

¹Faculty of Psychology, University of Muhammadiyah Malang, Indonesia

Abstract. Moral desensitization has become a critical issue in the digital age, as exposure to violence and ethical violations intensifies through media and algorithms that display repetitive narratives. This study aims to analyze the development of the concept and theory of moral desensitization, identify research gaps, and synthesize findings to enrich theory development. A narrative review approach was used to review 15 articles (2003–2024), integrating evidence from laboratory experiments, longitudinal surveys, and neurophysiological measurements. The results indicate that moral desensitization is a multipath phenomenon encompassing affective habituation, physiological-neural adaptation, attentional changes, and cognitive-evaluative mechanisms such as the moral repetition effect. Consistent evidence on the affective pathway supports decreased empathy and prosociality, while neural outcomes are variable and require more rigorous indicator mapping. Future research should develop longitudinal designs, explicitly measure moral judgment, and explore cross-cultural and age-specific approaches. Practical implications include developing media literacy and policies that anticipate the impact of the normalization of violence through narrative repetition, to prevent moral desensitization in society.

1 Introduction

The phenomenon of moral desensitization has become an increasingly crucial issue in today's digital era. Exposure to violence and morally unethical behavior, whether directly occurring in real life or repeatedly presented through media such as television, films, and especially video games, is considered to have profound implications for changes in individual moral sensitivity and social behavior [1–3]. In modern society, violent content is not only easily accessible, but also often becomes a normalized daily consumption, especially among adolescents and young adults. This raises concerns about decreased empathy, tolerance for moral violations, and a tendency for increased aggressive behavior in social life [4–6].

The issue of moral desensitization is not only of concern to psychologists, but also to educators, policymakers, and the wider public. At the individual level, moral desensitization triggers changes in how a person interprets right and wrong actions, blurring ethical

* Corresponding author: irfanmuzni@webmail.umm.ac.id

boundaries, and potentially increasing the risk of antisocial behavior and violence [1,3]. Meanwhile, at the social level, the emergence of permissive behavior towards violence can threaten social cohesion and reduce people's sensitivity to the suffering or injustice experienced by others [7,8]. The effects of desensitization can extend from fictional media to responses to violence in the real world, weakening prosocial norms and strengthening permissive attitudes towards ethical violations [2,5,6].

Theoretically, the concept of moral desensitization is rooted in classical research in social and developmental psychology, which initially examined the process of emotional habituation and the decline in affective responses due to repeated exposure to negative stimuli [9,10]. Wolpe and Rule & Ferguson formulated the theory of emotional desensitization as a mechanism by which emotional responses to stimuli would decrease with increasing frequency of exposure [9,11]. On the other hand, Bandura, through Social Cognitive Theory, extended this understanding to the area of social learning, emphasizing the role of observation and imitation of models of aggressive behavior in the formation of individual moral schemas [3,11].

In further developments, the General Aggression Model (GAM) developed by Anderson and Bushman integrates cognitive, affective, physiological, and environmental aspects in explaining the relationship between exposure to media violence, decreased empathy, and increased aggressive behavior [2,3]. The GAM emphasizes that exposure to violence not only triggers a momentary affective response, but also gradually forms cognitive schemas and internal norms that influence long-term behavior [12].

The concept of desensitization has also been expanded upon through contemporary research highlighting the impact of repetition and the illusory truth effect in weakening individuals' moral judgment. Repeated exposure to narratives of moral violations, whether through social media or online news, makes individuals more permissive and reduces their level of condemnation of ethical violations [8,10].

Although the literature has made significant contributions to understanding moral desensitization, several gaps remain. First, There are inconsistencies in research findings regarding the physiological and neural effects of desensitization [12,13]. These inconsistencies can have implications for the validity of the concept and the direction of theory development. These inconsistencies can also obscure the mechanisms underlying the phenomenon, hindering the mapping of relationships between exposure, affective changes, and moral schema restructuring. Without consistent evidence, causal inferences are weak and will limit the generalizability of the theory. Therefore, consistency of findings is important to ensure the robustness of moral desensitization theory.

Second, the majority of studies use cross-sectional or short-term experimental designs, making it difficult to draw long-term causal conclusions [11,14]. These designs capture only a momentary snapshot of a phenomenon, leaving the direction of causal relationships ambiguous. This limitation also hinders understanding whether the effects of desensitization are temporary or persist over the long term, information that is crucial for designing preventive interventions and media policies.

Third, research is still limited to adolescent or young adult populations in Western countries, while cross-cultural implications and subsequent developmental age have not been widely explored [5,7]. The limited research on adolescent and young adult populations in Western countries poses a risk of generalization bias. The process of moral desensitization is likely influenced by different stages of cognitive development, emotion regulation, and moral capacity in each age group. Without comparing groups across ages, it is difficult to understand whether desensitization is a developmental phenomenon or a universal phenomenon consistent across the lifespan. Furthermore, cultural context influences moral norms and interpretations of transgressions. Exposure to violence or transgressions that are considered serious in one culture may be considered normal in another, thus the effects on blunting emotional responses and moral evaluations may vary. Ignoring cultural diversity risks producing ethnocentric models, which, when applied

globally, could confound the design of interventions or policies.

Given the ongoing gaps in understanding the mechanisms, duration, and context of moral desensitization, this review seeks to synthesize findings from various theoretical and methodological approaches. Thus, it is hoped that this review will contribute to the development of moral psychology and media studies, particularly in mapping the cognitive-affective mechanisms involved in the desensitization process, explaining differences in impacts based on context, population, and media type, and providing evidence-based research and recommendations for preventive interventions.

Specifically, the objectives of this study are (1) to analyze the development of the concept and theory of moral desensitization, along with the empirical evidence that underpins it; (2) to identify research gaps and areas that still require further exploration, both in terms of methodology, population, and measurable variables; (3) to develop conceptual arguments and synthesize research results to enrich the development of theories, interventions, and policies related to moral desensitization.

2 Method

This study employs a narrative review, examining relevant literature on moral desensitization in the digital age. The literature was selected based on its relevance to the topic, encompassing social and cognitive psychology theories, as well as empirical findings related to exposure to violence in the media. The analysis is conducted narratively, emphasizing the relationship between theory, research findings, and practical implications, thus forming a comprehensive conceptual synthesis on moral desensitization.

This narrative review summarizes the findings of 15 articles obtained from leading publishers and published between 2003 and 2024, using a variety of methodologies, including laboratory experiments, longitudinal surveys, and neurophysiological measurements [1-15]. The studies addressed issues related to moral desensitization, including changes in empathy, emotional or physiological reactivity, and moral judgment. The primary material underlying this review includes empirical articles, literature reviews, and theories addressing the topic of moral desensitization.

The reviewed studies involved diverse populations, ranging from children and adolescents to young adults. Some studies also highlighted groups with specific characteristics, such as individuals living in high-crime neighborhoods [7], and comparisons between heavy gamers and non-gamers [4,13,15] .

The identification process was conducted by searching scientific articles through Scopus and Google Scholar using the keywords "desensitization" AND "moral desensitization." Publication years were limited to the last two decades (2003–2024) and only those published in English. Articles included in this review were relevant to the topic of moral desensitization.

Table 1. List of Scientific Articles.

Writer	Year	Sample	Design	Findings
Miedzobrodzka et al.	2023	64 teenagers (aged 13–17 years)	EEG (ERP) experiment	Exposure to violent games decreases late positive potential (LPP) indicating neural desensitization to the pain of others.
Bushman & Anderson	2009	482 participants (320 students, 162 adults)	Laboratory experiments	Exposure to violent films/games makes individuals slower to help victims of real violence, indicating decreased prosociality.

Brockmyer	2022	Review of child & adolescent studies	Narrative review	Desensitization to violent media reduces empathy, increasing permissiveness to violence, through the mechanism of emotional habituation
Carnagey, Anderson & Bushman	2007	857 Students (124 men and 133 women)	Laboratory Experiments, physiology (HR, SCL)	Playing violent video games decreases physiological responses to real violent videos.
Fanti et al.	2009	91 students	Laboratory Experiments,	Brief exposure to violent media leads to decreased negative affect and increased aggressiveness on behavioral tests.
Effron	2022	Several online Experiments (3,301 people)	Social psychology experiments	Moral repetition effect: repetition of a moral violation makes the action seem less unethical.
Di Tella et al.	2019	160 participants aged 24–65 years	Experiment	Living in a crime-prone area causes emotional and physiological desensitization to violence.
Mrug et al.	2015	180 teenagers (13–17 years)	Lab experiments + physiology	Exposure to real & film violence decreases emotional and physiological responses (HR, GSR).
Mrug et al.	2016	3,000 adolescents (longitudinal study)	Longitudinal (2 years)	Emotional desensitization mediates the relationship between exposure to violence and violent behavior.
Pillai et al.	2023	607 adults	Naturalistic analysis	Repeating the narrative of the violation makes the public perceive the violation as more reasonable, in line with the illusory truth effect.
Miles-Novelo & Anderson	2021	Does not provide the number of articles reviewed	Encyclopedia/narrative review	Describes desensitization theory in media psychology, including cognitive, affective, and social aspects.
Funk et al.	2004	607 teenagers	Cross-sectional survey	Exposure to violence in the media (TV, games, internet) is correlated with low empathy and permissive attitudes.
Funk et al.	2003	122 children (grades 4–5)	Survey & moral evaluation task	Children who frequently play violent games are more permissive in moral evaluation and show more blunted emotional reactions.
Goodson et al.	2021	49 students (gamers & non-gamers)	EEG Experiment (P300)	Found no evidence of decreased P300 in gamers, challenging the neural desensitization hypothesis.
Kirsh & Mounts	2024	120 teenagers (gamers vs non-gamers)	Behavioral experiments	Exposure to violent games reduces sensitivity to non-physical interpersonal

conflict, but not necessarily to
extreme violence.

The obtained articles were read in their entirety to obtain information regarding the research objectives, theories used, research methods, key findings, weaknesses, and recommendations. The analysis was conducted narratively and comparatively, highlighting common patterns and differences in the findings and linking them to the theoretical frameworks employed by the researchers.

3 Result

3.1 Development of Concepts, Theories, and Empirical Evidence

Early literature viewed desensitization as a decrease in affective or physiological responses to violence, which was then linked to socio-moral consequences [2,9]. However, the link between decreased arousal and more relaxed moral judgments was not always straightforward.

Recent reviews emphasize that desensitization is a multidimensional phenomenon (affective, attentional, physiological/neural, and cognitive) and highlight the need for a sharper conceptual definition to distinguish moral desensitization from ordinary emotional habituation [3,12]. An important contribution comes from the social-cognitive realm through the moral repetition effect: repeated exposure to descriptions of violations makes them judged less unethical [10], an effect confirmed in naturalistic studies [8]. Thus, in the algorithmic era, the pathway of moral desensitization includes not only emotional habituation but also a softening of ethical evaluations due to narrative repetition.

In detail, the affective pathway explains how decreased negative emotions decrease empathy and prosocial behavior [1]. The physiological/neural pathway is partially supported: autonomic responses decrease after playing violent games [2], but neural evidence is mixed; one ERP study supports modification of the empathy-pain response [4] while a P300 study does not support the neural desensitization hypothesis [13]. The attentional pathway is more nuanced: exposure to violent games can alter sensitivity to threat without necessarily blunting all reactions to violence [15]. The cognitive

evaluative pathway shows that repetition of violation descriptions decreases moral condemnation even though arousal remains unchanged [8,10].

Empirically, experiments have shown a gradual decrease in physiological responses each time participants are exposed to repeated violent scenes [2,9] and a decrease in readiness to help after watching violent films [1]. While supporting the model that decreased affective/physiological responses after exposure to violence decrease prosocial behavior, these studies have not explicitly assessed moral judgment.

Exposure to violent media is also correlated with lower empathy and pro-violence attitudes in children [6,11]. Longitudinal studies have found that emotional desensitization predicts later violent behavior [5,14], supporting the developmental process model. However, neural results are mixed. ERP findings in adolescents support reduced empathy-pain [4], but the P300 is inconsistent as an indicator [13], emphasizing the importance of construct validity.

Experimental [10] and naturalistic [8] studies show that repetition of violation descriptions changes how people evaluate an action, become less unethical, although emotional reactions may not change. This finding extends the concept of moral desensitization to the cognitive-evaluative realm. In crime victims, watching criminal events triggers desensitization in a real-world context [7], broadening the scope of the concept that

desensitization processes also occur in real-life situations, not just when watching movies or playing games.

In general, these studies consistently show that exposure to violence can reduce emotional and physiological reactions, which then makes people less likely to help or behave prosocially [1,2,9]. However, findings from brain (neural) studies are still conflicting, some finding changes in empathy signals, while others do not [4,13]. Meanwhile, research on cognitive-evaluative pathways shows that moral judgments can become more relaxed simply due to repeated exposure, without necessarily being accompanied by a decrease in emotional reactions, thus challenging the old model that equates moral desensitization with simply being emotionally accustomed [8,10].

3.2 Research Gaps: Methodology, Population, and Variables

Many classic findings on desensitization rely on acute exposure in the laboratory, for example, violent video games followed by exposure to real violence to measure physiological reactivity [2] or exposure to violent films followed by helping behavior in experimental scenarios [1]. Rapid affective habituation dynamics have also been demonstrated in short-duration, repeated exposure protocols [9]. These designs are powerful for immediate causal inference, but weak at capturing gradual moral change in the real world (e.g., shifts in norms and daily ethical judgments).

Longitudinal evidence that truly links desensitization trajectories to actual behavior is scarcer. A series of adolescent studies suggests that emotional desensitization in early adolescence can predict violent behavior years later [5] and is associated with decreased emotional reactivity to violence [14]. However, most longitudinal work continues to emphasize affect/emotion, rather than normative moral indicators (e.g., condemnation, willingness to punish). On the other hand, digital ecology (interactivity,

algorithms that generate narrative repetition) is only beginning to enter empirical design through cognitive-evaluative pathways, namely the moral repetition effect [10] and naturalistic field evidence [8].

In the neuro/physiological realm, the inference from markers to morality remains indirect. Decreased autonomic arousal after playing violent games [2] or modulation of ERP components related to empathy for pain [4] are often read as moral desensitization, even though these signals also capture attention/novelty. In fact, there are null findings for the blunted P300 hypothesis in gamers [13], confirming that not all neural indices map to moral change.

Early research in children or adolescents linked exposure to violent media with lower empathy and pro-violence attitudes [6,11], but often relied on correlations and was susceptible to confounding (trait aggression, family or school context). Some experimental studies strengthened the affective-behavioral link (helping down) [1], but rarely triangulated it with explicit moral judgments at the same time. In a population context, most laboratory experiments and many survey studies have been conducted with adolescents or young adults in Western contexts [1,2,6,9,13]. This limits generalizability across cultures and across ages. For example, ERP findings in adolescent boys [4] do not necessarily apply to girls, preadolescents, or older adults. Similarly, patterns of emotion-induced blindness and attention to threat in adults [15] have not been mapped across cultures or ages. Real-life exposure can shape different desensitization trajectories, as shown in crime victims who become less reactive to crime footage [7]. However, such studies are still rare compared to studies of entertainment media.

In the context of variables, many studies operationalize desensitization through affective/physiological indicators, HR/GSR [2], distress/enjoyment [9], empathy [6], and then assume it as a moral change. However, moral evaluations (condemnation, punishment intentions, norm violations) can change through different pathways, for example, repetition of descriptions without decreasing arousal [8,10].

The ecology of digital platforms gives rise to narrative repetition that decreases moral condemnation and increases perceived righteousness [8,10]. This differs from mere exposure to intense violence, which primarily decreases arousal [1,2,9]. Many designs have not separated these two mechanisms in their measurements, making it difficult to conclude which pathway is dominant in changing ethical judgments.

Attentional changes to threat/emotion can occur without producing a complete dulling [15]. In the neural realm, the modulation of empathy-pain ERPs [4] and the absence of a P300 effect [13] suggest that a single neural variable cannot be used as a sole proxy for moral desensitization.

3.3 Conceptual Arguments and Synthesis of Research Results

Historically, desensitization has been used to describe a reduction in affective/physiological responses to violence (autonomous habituation, decreased distress) and has subsequently been assumed to impact prosocial behavior and ethical judgment [1,2,9]. However, moral desensitization should refer to changes in normative evaluation, not simply a temporary decrease in arousal or empathy. Recent conceptual reviews emphasize its multi-pathway nature (affective, attentional, physiological/neural, cognitive-evaluative) and call for a more refined definition and taxonomy of measures to prevent morality from being reduced to affect alone [3,12]. Two important contributions to this construct are: (i) the separation between emotional habituation and ethical evaluation, and (ii) the recognition of narrative repetition as an evaluative mechanism autonomous from arousal [8,10].

Conceptual argument 1. Moral desensitization is best understood as a change in how a person judges the rightness or wrongness of an action (injunctive norms), not simply a reduction in surprise or emotional reactions. This change can occur with or without a decrease in physiological arousal. Therefore, measures such as heart rate, skin responses, or brain signals are not sufficient to conclude that moral desensitization has occurred. It is also necessary to measure explicit moral judgments (e.g., how wrong an action is judged to be) [1,2,9] vs. [8,10].

Conceptual argument 2. Moral desensitization in digital ecosystems is most coherently understood as a multi-pathway model: (A) affective, (B) physiological/neural, (C) attentional, (D) cognitive– evaluative (repetition). Pathway (D) bridges morality directly, while (A - C) provide a facilitative context that can facilitate the softening of evaluations.

(A) Affective pathway.

Exposure to violence reduces distress and helping in experimental scenarios; this is consistent with film/game studies with immediate behavioral outcomes [1,9]. Playing violent games reduces physiological reactivity to witnessing real violence [2]. In children and adolescents, exposure to violent media is correlated with lower empathy and pro-violence attitudes [6,11]; longitudinal studies show that emotional desensitization in early adolescence predicts violent behavior years later [5,14]. These pathways are robust to social consequences, but have not always measured explicit moral condemnation.

(B) Physiological/neural pathways.

Physiological evidence (HR/GSR) supports habituation [2]; neural evidence is more mixed. In adolescents, ERP modulation related to empathy for pain emerged after violent gaming sessions [4], but

other P300 studies do not support the blunted neural hypothesis in gamers [13]. This means that neural components index both attention/novelty and empathy, not moral automatism; a rigorous metric mapping of mechanisms is needed to avoid overinference [2,4,13].

(C) Attentional pathway.

Findings regarding threat/affect-driven attention do not necessarily follow a “blunt to all violence” pattern. Recent attention studies have shown nuanced effects (e.g., emotion-induced blindness), suggesting a redistribution of attention under specific conditions rather

than a global blunting [15]. This pathway primarily influences what is attended to (salience), and only indirectly influences moral evaluations unless linked to a normative framework.

(D) Cognitive–evaluative pathway (narrative repetition).

A series of experiments demonstrates the moral repetition effect: repeated descriptions of transgressions are judged to be less unethical, while appearing more truthful (link to illusory truth), without necessarily decreasing arousal [10]. Naturalistic evidence in real-world settings confirms that repetition in everyday information ecologies actually shifts moral evaluations [8]. This pathway explains how the recirculation of narratives can blunt moral condemnation.

4 Discussion

The results summarized in this review demonstrate that moral desensitization is a multi-pathway phenomenon involving affective, physiological/neural, attentional, and cognitive-evaluative processes. The consistency of findings across affective and physiological pathways, such as decreased arousal and reduced prosocial behavior following exposure to violence [1,2,9], provides a strong basis for the role of emotional habituation. However, this evidence alone is insufficient to conclude that moral norm change has occurred. As Effron [10] and Pillai et al. [8] have shown, softening of ethical judgments can occur simply due to repetition of descriptions of violations, even without decreased arousal. This challenges the traditional model that equates moral desensitization with emotional habituation alone, and extends the concept to a cognitive-evaluative dimension.

Neural findings paint a more complex picture. Altered ERP responses to empathy-pain following violent game exposure [4] support the empathic pathway hypothesis, but the P300 study that found no differences [13] suggests caution in using neural indicators as moral proxies. This variability in results may stem from differences in paradigms, populations, or measurement sensitivity, so future research should link neural indicators to explicit measures of moral judgment to avoid overly biased inferences.

Comparisons between laboratory and naturalistic studies are also important. Laboratory studies tend to use short-term exposure, whereas longitudinal research in adolescents [5,14] shows that emotional desensitization can predict later violent behavior. This strengthens the idea that desensitization is a gradual learning process that occurs over time. Naturalistic studies of moral repetition [8] add concrete ecological evidence that repetitive content distribution algorithms can reinforce the normalization of transgressions. Integrating longitudinal designs with observations of platform ecology is key to understanding the dynamics of moral desensitization in the digital world.

Theoretically, these findings point to an integrative model containing four main pathways: (1) affective habituation that decreases emotional reactivity, (2) reorientation of attention to violence cues [15], (3) physiological/neural adaptation that requires remapping of indicators [4,13], and (4) cognitive evaluative repetition that softens moral judgments [8,10]. This model is superior to single approaches because it is able to explain why someone can judge violence as more normal while still feeling emotional tension, or conversely, still react emotionally but consider it less wrong.

This review underscores the importance of expanding research to more diverse populations and contexts. The majority of studies used adolescent or young adult samples from Western countries [6,11], so global generalization is still limited. Given the cross-cultural nature of digital platforms, cross-country and age-group studies are crucial to understanding whether patterns of moral desensitization are universal or dependent on cultural norms and developmental stage.

Although this review attempts to provide a comprehensive synthesis, it has several methodological limitations. The review only included 15 articles, which is relatively small in scope to capture the full diversity of methodological approaches and study populations. Furthermore, the review used a narrative review, which is susceptible to selection bias, and

the synthesis results are heavily influenced by the authors' selection of studies. Therefore, replication of this review by other researchers may yield different conclusions. The literature search was also limited to Scopus and Google Scholar, with English-language publications from the last two decades. This may increase the risk of publication bias, as studies in languages not indexed in these databases may be missed.

5 Conclusion

This study confirms that moral desensitization is a multi-pathway phenomenon involving affective, physiological-neural, attentional, and cognitive-evaluative dimensions. The development of the theory shows that moral desensitization cannot be equated with emotional habituation, but rather a model that places normative evaluation at the core. Empirical evidence supports that exposure to violence decreases emotional arousal, empathy, and prosocial behavior, but findings on the moral repetition effect suggest that ethical judgments can become more lax even if arousal remains unchanged. This broadens the concept of moral desensitization to include changes in how we evaluate right and wrong, rather than simply a decrease in affective sensitivity.

Research gaps include the predominance of short-term experimental designs, the lack of longitudinal data assessing explicit moral judgments, and the limited population size of predominantly adolescents or young adults in Western countries. Future research should expand across cultures and age groups, utilizing longitudinal designs and digital ecology approaches to understand the influence of algorithms and narrative repetition on the normalization of transgression.

Theoretically, the synthesis of the results leads to an integrative model with four main pathways: affective habituation, physiological-neural adaptation, attentional reorientation, and cognitive-evaluative softening through repetition. This model explains how individuals can still experience negative emotions but judge a violation as less wrong, or vice versa. This contribution enriches moral psychology theory and provides a basis for interventions and policies, such as media literacy, that highlight the impact of narrative repetition on moral perception. Thus, this study helps understand how exposure to violence, whether through media or digital algorithms, can shape the trajectory of moral desensitization in society.

6 Implication

The results of this study emphasize the need for future research that integrates longitudinal designs and digital ecology approaches to more realistically capture the dynamics of moral desensitization, while linking affective, neural, and cognitive indicators with explicit measures of moral judgment. Cross cultural and cross-age studies are crucial to determine whether desensitization patterns are universal or influenced by local norms. From a policy perspective, these findings support the development of media literacy and algorithm regulation that address the impact of narrative repetition on the normalization of moral violations, as well as educational interventions that emphasize the importance of ethical reflection to prevent society from losing its moral sensitivity to violence.

Acknowledgements: Thanks are extended to Muhammadiyah University of Malang and Muhammadiyah University of Metro for providing support in writing this paper.

Data Availability Statement: The data supporting this article is sourced entirely from openly available academic publications in international journal databases. Requests for data and references are welcome. Please contact the lead author by email.

Authors' Contributions Statement: The authors played a full role in all stages of research and writing, including formulating research objectives, collecting and selecting literature, analyzing data,

interpreting findings, preparing the manuscript, and final revisions.

Competing Interests: The authors have no conflicts of interest that could influence the results of this study.

References

1. B. J. Bushman and C. A. Anderson, Comfortably numb: desensitizing effects of violent media on helping others, *Psychol. Sci.* **20**, 273 (2009) <https://doi.org/10.1111/j.1467-9280.2009.02287.x>
2. N. L. Carnagey, C. A. Anderson, and B. J. Bushman, The effect of video game violence on physiological desensitization to real-life violence, *J. Exp. Soc. Psychol.* **43**, 489 (2007) <https://doi.org/10.1016/j.jesp.2006.05.003>
3. A. Miles-Novelo and C. A. Anderson, *Desensitization*, in *The International Encyclopedia of Media Psychology* (John Wiley & Sons, Ltd, 2020), pp. 1–11 <https://doi.org/10.1002/9781119011071.iemp0056>
4. E. Miedzobrodzka, J. C. van Hooff, L. Krabbendam, and E. A. Konijn, Desensitized gamers? Violent video game exposure and empathy for pain in adolescents – an ERP study, *Soc. Neurosci.* **18**, 365 (2023) <https://doi.org/10.1080/17470919.2023.2284999>
5. S. Mrug, A. Madan, and M. Windle, Emotional Desensitization to Violence Contributes to Adolescents' Violent Behavior, *J. Abnorm. Child Psychol.* **44**, 75 (2016) <https://doi.org/10.1007/s10802-015-9986-x>
6. J. B. Funk, H. B. Baldacci, T. Pasold, and J. Baumgardner, Violence exposure in real-life, video games, television, movies, and the internet: is there desensitization?, *J. Adolesc.* **27**, 23 (2004) <https://doi.org/10.1016/j.adolescence.2003.10.005>
7. R. Di Tella, L. Freira, R. H. Gálvez, E. Schargrofsky, D. Shalom, and M. Sigman, Crime and violence: Desensitization in victims to watching criminal events, *J. Econ. Behav. Organ.* **159**, 613 (2019) <https://doi.org/10.1016/j.jebo.2017.10.005>
8. R. M. Pillai, L. K. Fazio, and D. A. Effron, Repeatedly Encountered Descriptions of Wrongdoing Seem More True but Less Unethical: Evidence in a Naturalistic Setting, *Psychol. Sci.* **34**, 863 (2023) <https://doi.org/10.1177/09567976231180578>
9. K. A. Fanti, E. Vanman, C. C. Henrich, and M. N. Avraamides, Desensitization to media violence over a short period of time, *Aggress. Behav.* **35**, 179 (2009) <https://doi.org/10.1002/ab.20295>
10. D. A. Effron, The moral repetition effect: Bad deeds seem less unethical when repeatedly encountered, *J. Exp. Psychol. Gen.* **151**, 2562 (2022) <https://doi.org/10.1037/xge0001214>
11. J. B. Funk, D. D. Buchman, J. Jenks, and H. Bechtoldt, Playing violent video games, desensitization, and moral evaluation in children, *J. Appl. Dev. Psychol.* **24**, 413 (2003) [https://doi.org/10.1016/S0193-3973\(03\)00073-X](https://doi.org/10.1016/S0193-3973(03)00073-X)
12. J. F. Brockmyer, Desensitization and Violent Video Games: Mechanisms and Evidence, *Child Adolesc. Psychiatr. Clin. N. Am.* **31**, 121 (2022) <https://doi.org/10.1016/j.chc.2021.06.005>
13. S. Goodson, K. J. Turner, S. L. Pearson, and P. Carter, Violent Video Games and the P300: No Evidence to Support the Neural Desensitization Hypothesis, *Cyberpsychology Behav. Soc. Netw.* **24**, 48 (2021) <https://doi.org/10.1089/cyber.2020.0029>

14. S. Mrug, A. Madan, E. W. Cook, and R. A. Wright, Emotional and Physiological Desensitization to Real-Life and Movie Violence, *J. Youth Adolesc.* **44**, 1092 (2015) <https://doi.org/10.1007/s10964-014-0202-z>
15. S. J. Kirsh and J. R. W. Mounts, Violent Video Game Play and (De)Sensitization to Threat, *Aggress. Behav.* **50**, e70003 (2024) <https://doi.org/10.1002/ab.70003>