How is Reality Misconstrued by Misinformation on Social Media Platforms Among Adolescents

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Abstract

This essay discusses the hazardous effects of misinformation on adolescents as perpetuated by social media platforms, reinforcing the socio-psychological and behavioral implications. Based on the formation of shared reality, the paper argues that misinformation affects teenagers' cognitive development and the establishment of their belief systems. It highlights the cause of such influence, focusing specifically on the developmental stage of teenagers and the consequences it brings about: such as heightened sensitivity, diminished capacity for critical thinking, emotionally charged viewpoints, etc. The essay also delves into the behavioral consequences of misinformation. To address these critical issues, the essay critiques existing content moderation and administration strategies on social media. It proposes a multifaceted solution that targets policy-making and educational collaboration. This proactive and holistic approach ensures healthier cognitive development and more rigorous belief systems among teenagers navigating their paths along the proper use of social media.

Keywords

Adolescents, Social Media, Misinformation, Cognitive Development, Belief Systems, Shared Reality

Introduction

In this rapidly evolving era, social media have become the primary information source for teenagers to interpret the world. As controversial as it is, social media have also become the hotbed for the dissemination of misinformation, eventually influencing teenagers' cognition and

behaviors. This paper aims to explore how misinformation on social media causes both behavioral and socio-psychological influences on adolescents and to suggest potential solutions.

Adolescents' Cognitive Development

A study shows that 60% of surveyed American adolescents agreed with 4+ conspiracy statements compared with 49% of adults (Paul, 2023). As adolescents, individuals are typically in the formal operational stage, however, this does not guarantee the critical thinking skills necessary to evaluate information.

Biologically, their "brain regions associated with the desire for attention, feedback, and reinforcement from peers become more sensitive" (Weir, 2023). That is, the heightened sensitivity of the prefrontal cortex, which is responsible for decision-making; and the limbic system, which is involved in emotional response and reward processing; makes adolescents more attuned to social feedback and peer approval. In addition, due to the impulsive nature of adolescents, misinformation that is emotionally charged can trigger a dopaminergic reward response, this impulsivity can result in teenagers actively perpetuating the spread of misinformation without thorough consideration. Adolescents are a critical group when it comes to minimizing the harm of misinformation on social media in part due to their developmental characteristics, but also misinformation's potential to shape lifelong beliefs and behaviors.

Adolescents' Social Connection and Shared Understanding

"Birds of a feather flock together," as indicated by the homophily principle (Parkinson, 2022) — evolutionary, human beings demonstrate behaviors that align with the similarity-attraction hypothesis. Similarities in how individuals construe the world is known as shared reality (Parkinson, 2022). Neurological evidence has proved that "individuals genuinely update

their own perceptions about the world in light of information from others" (Parkinson, 2022), meaning that our judgments can be affected by information, be it misleading or not.

Social Media Algorithms and Misinformation Propagation

Echo Chambers and Attention Economy

Social media creates echo chambers, wherein algorithms and personalization often reinforce and amplify selective exposure to like-minded information; individuals may perceive these chambers as reliable simply due to their high frequency of occurrence without counterarguments. In addition, the underlying operational mechanism of social media platforms aligns with the attention economy, wherein the users' attention makes a profit. Complex algorithms analyze their preferences based on user duration, and the number of "likes" and "shares" they click. Then, platforms develop persuasive techniques by showing similar information to attract users' attention. The underlying algorithms cause the formation of information cocoons and confirmation bias among users.

Content Propagation Mechanisms

A study showed that false news spreads 6 times faster than true news on Twitter (Dizikes, 2018). Misinformation on social media refers to inaccurate information being published and disseminated both intentionally and unintentionally (Wu, 2019). Social media are said to be "blind to content" and have "a limited capacity to filter out harmful materials" (Park et al., n.d.). For instance, the traditional rumor detection methods rely on textual content, neglecting the information provided by the structure of the propagation (Wang et al., 2019).

The Impact of Misinformation on Adolescents

The Impact on Cognitive Perception & Shared Reality

The cognitive impact caused by misinformation affects teenagers by creating cognitive biases and interfering with information processing. When misinformation is widely shared and accepted in their social circles, it creates a false shared reality among them that does not align with factual information. For example, it is becoming prevalent for information to be presented as visuals; however, the visuals can also be easily manipulated or tempered, deluding the public while not noticeable (Thakur, 2020). This proves that reality can be easily distorted by falsehood, posing potential harm to teenagers' information processing process.

In addition, the cognitive impact also includes the disruption of critical thinking and analytical skills by undermining their fact-checking abilities and decreasing skepticism. When adolescents are inundated with vast amounts of information and with a limited brain capacity for information processing, according to the cognitive load theory, individuals resort to heuristic processing rather than engaging in rigorous fact-checking.

The Impact on Belief Systems

A belief system is defined as a set of propositions [that] represents a person's doxastic state or credal state in a certain situation (Hilpinen, 1995). Teenagers tend to be easily evoked by emotionally charged misinformation, this might overshadow their critical thinking and lead to a polarized worldview. Like echo chambers, social media creates filter bubbles where adolescents are exposed to information that aligns with their existing beliefs. However, filter bubbles exacerbate confirmation bias, leading to less openness to alternative viewpoints. This lack of exposure to counterarguments facilitates the intake of extreme ideologies. In addition, another pervasive category of misinformation is conspiracy theories and fringe ideologies. Teenagers might find social support and affirmation among like-minded individuals who support such

theories. This social verification need can further entrench their radicalized viewpoints, gradually forming solid biased belief systems.

Changes in Actual Behaviors

Living in a shared reality built of misinformation, individuals' behaviors can be unconsciously influenced collectively. This includes social impairment, educational trajectories, physical influence, etc.; I will focus on physical implications. According to a health advisory exclusively for social media use in adolescents issued by APA, "social comparison leads to poorer body image, disordered eating, and depressive symptoms" (McCabe, 2023), potentially harming teenagers physically. When exposed to unsafe behaviors online, teenagers may be at greater risk of engaging in similar behaviors themselves (Weir, 2023). In addition, in research investigating the impact of sharing COVID-19 misinformation online on mental health, the result indicated that the consumption of misinformation on social media "can potentially worsen the mental health of individuals", and can even cause "suicidal ideation" (Verma et al., 2022).

Interventions and Recommendations

For Policymakers

The administration method should be adjusted to a system that involves a credit rating scale — similar to transaction platforms and banking systems — where individuals are rewarded for reporting unauthorized accounts for spreading any misinformation, and those who take part in the creation and dissemination of misinformation will be given punishments. When the credit points reach a certain level, users will no longer be able to interact publicly with others on all social media platforms and cannot register a new account. Moreover, social media platforms should declare and implement a set of transparent legislations that clearly draw the boundaries of misinformation and explain the punishment rules thoroughly. Currently, social media platforms

lack supervision and the rules for distinguishing misinformation are subjective and ever-changing. Therefore, a third-party detection institution should also be involved.

For Educators and Parents

Social media platforms should be socially responsible and cooperate with schools to educate adolescents. An MKO, or a more knowledgeable other, provides guidance and modeling for individuals to learn within their zone of proximal development; this includes affecting the development of higher-order functions, such as formal reasoning (McLeod, 2024). With the help of an MKO, adolescents can have better judgment when encountering misinformation.

In school settings, teachers are the best MKOs. Schools therefore should open courses regarding effective use of technologies. The content should not be limited to distinguishing misinformation, other related topics such as effective use of AIs, anti-cyberbullying, cybersecurity, etc., should also be considered as compulsory courses at schools to ensure safer use of the internet. This idea functions similarly to a process known as psychological inoculation, which has been proven effective by many studies — by exposing individuals to "pre-treatment that builds their resilience" (McPhedran, 2023) towards misinformation. Although theories such as confirmation bias and anchoring effect all state that people tend to have a fixated mindset when it comes to altering their original beliefs; a combination of pre-treatment warning adolescents of potential misinformation trending on social media and a post-treatment including education for proper distinguishing skills can effectively diminish the negative impact of misinformation on adolescents' cognitive perception and belief systems. In addition, parents should also actively cooperate with schools to ensure adolescents' understanding of the knowledge covered at schools.

Conclusion

The influence of social media misinformation on adolescents is multifaceted, including but not limited to their cognitive development, psychological state, physical recognition, and the formation of belief systems. Being in a volatile cognitive stage yet with an immature perspective, adolescents are a critical group in the face of misinformation. To address this concern, social media platforms should implement radical changes regarding their operational mechanism, and should unite educational institutions and parents. Through collective efforts, we can ensure a safer environment for adolescents.

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