

**The Impact of Social Media Misinformation on Adolescents' Cognitive Perceptions and
Belief Systems**

Man Shu Katie Lai

Harrow International School Hong Kong

August 15th, 2024

Abstract

The expansion of online misinformation has become a pressing issue, affecting individuals' perspectives of social norms and psychological well-being. While digital platforms provide convenient and efficient means of exchanging information, they also expose young people to erroneous and misleading content. This essay examines the dangers and impacts of false information in the modern digital age, specifically on the vulnerable group of adolescents. This essay first addresses how misinformation hinders adolescents' cognitive development in memory, attentional, and stress-coping mechanisms. As disruption extends to identity formation, adolescents are often drawn to misinformation that reinforces aspects of their identity, such as political and social beliefs. Furthermore, solutions are proposed to mitigate the spreading of misinformation, such as developing censorship mechanisms to block fake news and instituting media rules to assist in the eradication of misinformation via fast-track reporting systems. Though eradicating false information is difficult, further implementation through educational campaigns to raise awareness of the dangers of false information and institutions that provide lectures to develop critical thinking skills related to digital literacy can be critical in reducing the risks of misinformation. Given the considerable impact of misinformation on adolescents, media platforms and organizations must handle the issue with a plan that reduces the spread of disinformation and creates a safer digital environment.

Keywords: Online misinformation, Adolescents, Cognitive development, Beliefs

The Impact of Social Media Misinformation on Adolescents' Cognitive Perceptions and Belief Systems

Adolescents are maturing in a complex digital world. Accompanying the development of media in recent decades, the expenditure of social media culture has led to a greater diversity of access to information. Network platforms enable freedom for emotional expression and exchanging thoughts and ideas. However, the power of media influence on perceptions and knowledge is undeniable. By providing communities with various platforms to communicate and spread information, the network flow of content has led to a proliferation of misinformation and false news. With a simple click, digital technology provides combinations of factual and illegitimate sources, leaving youngsters vulnerable and exposed to misinformation. Specifically, adolescents' open-minded and impressionable nature heightens the media's impact on ideology constructs.

The primary issue is that adolescents are largely unaware whether online content is true or fraudulent. Today, misinformation is regarded as false or inaccurate information deliberately created and intentionally or unintentionally propagated (Wu et al., 2019). This essay will discuss the impact of exposure to online misinformation on cognitive development and psychological belief systems in maturing adolescents.

Misinformation on the Cognitive Development of Adolescents

Vulnerability

Intensified susceptibility to exposure to online misinformation in adolescents may be factored by neurodevelopmental processes that hinder social cognitive skills. Specific interactions between adolescents' striatal, prefrontal cortical, and salience processing systems simultaneously constrain and amplify component processes of mature decision-making (Hartley & Somerville, 2015). Additionally, the nonlinear development of the reward system—which is frequently hyperresponsive to incentives in adolescence—does not

correspond with the comparatively modest, linear development of impulse control and response inhibition during adolescence (Blakemore & Robbins, 2012). This implies that adolescents' emotions and social context may have an overpowering influence on logical thinking, suggesting that adolescent social cognitive abilities fluctuate and are unstable, making them mainly influenced by online misinformation.

Adolescents' active explorative developmental aspect contributes to their impressionistic responsiveness to misinformation. Navigating change requires youngsters to build up a sense of personal identity, involving the formation of a self-concept in which the past, present, and future are unified to form a whole (Erikson, 1959). Conforming to peers' expectations helps adolescents evaluate desirable social roles, but group conformity may elicit dependency which clouds adolescents' judgment. In the context of misinformation, online information that aligns with or reinforces certain identity aspects, such as political beliefs and social affiliations, may particularly appeal to adolescents searching for their identities. Thus, adolescents might be drawn to misinformation that strengthens their sense of belonging to an identity, making them more likely to accept and believe in false content. Furthermore, this may be detrimental to their process of shaping identity.

Impact on Cognitive Development

Adolescents' cognitive abilities, especially attentional and memory developments, are negatively impacted by exposure to misinformation. Digital media provides ongoing access to a limitless source of information, creating a sense of urgency to stay connected and informed. The transient repetitive motion of receiving information leads to continuous partial attention and multitasking (Shanmugasundaram & Tamilarasu, 2023). The diversion of attentional focus can impair cognitive performance, resulting in lower productivity and memory retention. Long term developmental effects may include the interference of

maturation of neural connectivity in brain regions, resulting in challenges with a short attention span.

The cognitive development of emotional and stress coping mechanisms may be altered. Sensational or alarmist misinformation often triggers strong emotional responses such as fear, anger, or anxiety. Consequently, adolescents may experience heightened emotional reactivity in response to the difficulty in managing the overstimulation of emotions. Additionally, constant exposure to distressing or misleading information can reduce emotional resilience, especially when not aligned with personal ideologies, making adolescents less capable of handling stress or adversity (Baby, 2016). The impact is substantial in long-term effects throughout the developmental stage; emotional instability and potential development of maladaptive stress responses may be undertaken, which puts adolescents in a more vulnerable state of well-being.

Misinformation often exploits and negatively alters reward pathways. Since seeing sensational content online that satiates one's beliefs triggers dopamine release, it elicits a reward response in the brain, which may prevent the brain from finding incorrect information more appealing. Long term establishments associating stimuli with rewards and punishers require the constant burst discharges of dopamine-containing neurons (Wise & Robble, 2020). When the brain becomes accustomed to treating online misinformation as an external stimulus that elicits reward, there will be increased development of dependency and overreliance. This causes alterations in reward and motivation systems, which rely on unstable external sources. This further hinders adolescents' developmental stage of cognitive abilities, which typically requires self-discipline.

Psychological Belief Systems

Social influence significantly impacts young people's developing social identities (Welborn et al., 2015). Acknowledging the abundance of misinformation, adolescents may

develop a change in belief in forming a sense of distrust toward information sources, institutions, and individuals. Consequently, adolescents may have difficulty distinguishing credible sources and an increased tendency to believe in unverified theories or claims, further reinforcing false beliefs and being prone to spreading misinformation.

Tajfel and Turner's (2004) Social Identity theory states that it is natural for individuals to identify and categorize themselves into ingroups to boost self-esteem; changes in individual beliefs are influenced by the natural tendency to favour ingroup members. In the context of online misinformation, adolescents may enjoy ingroup belonging from online user groups if the misinformation aligns with personal preexisting attitudes or emotions. Consequently, this strengthens adolescent identification with their ingroup and may increase bias against outgroups with dissimilar opinions. At the same time, adolescents may become more entrenched in their personal beliefs, leading to enhanced ingroup-outgroup conflicts and increasing adolescents' stereotypical views. As a result, this may lead to polarization and reluctance to consider alternative standpoints, increasing hostility and fostering social division and conflict, thus hindering adolescents' abilities to engage in balanced discussions.

Increased exposure to targeted misinformation can distort an individual's perceptions of reality. The cultivation theory proves that prolonged exposure to media content can influence viewers' beliefs and ideologies of reality, leading to adopting attitudes that follow portrayals seen on screen (Gerbner et al., 1994). Misinformation online may portray exaggerated, untrue social norms based on misleading information; for instance, social media's comparative nature pronounced a skewed perception of users' lives- frequently perceived as more successful (Krasnova et al., 2013). Hence, this reinforces a change in the recognition of the reality of social norms. Alternatively, exposure to alarmist misinformation may cause adolescents to perceive the world as more dangerous and hostile than it actually is. Thus, these cultivated changes in distorted beliefs of reality may lead to the adoption of

behaviours that are not commonly widespread or accepted. For example, engaging in risky online trends of extremity and harmful social practices. Additionally, having a distorted worldview may increase vigilance in heightening fear and anxiety, which can lead to adolescents' isolation from communicative socialization with certain groups and content with activities or places.

Solutions

One of the many roles of media platforms and organizations is to modulate and filter misinformation to minimize spreading. Absorbing a wide range of information online, audiences only passively accept interactions without confirming source and authenticity. As a result, social media must take responsibility for developing censorship mechanisms to enhance the accuracy of algorithms that automatically block fake news (Duan, 2023). Such efforts can be exemplified through Twitter's interventions of adjusting its internal algorithmic pushing mechanisms and hashtags to combat misinformation during the COVID-19 pandemic (Duan, 2023).

Another role is to implement media policies and provide support in reporting misinformation. International organizations may collaborate with social media policy departments to ensure guidelines for content providers are fit for purpose (World Health Organization, n.d.) In addition, emphasis on replenishing reporting systems for users may speed up the removal of misinformation; this may include media platforms developing access to fast-track reporting systems.

Despite ongoing efforts, eradicating all misinformation from media platforms remains impossible. However, educational campaigns for adolescents are equally crucial for informing and raising cautiousness about the possible revolving dangers and the destructive nature of overexposure to misinformation on cognitive development. Furthermore,

institutions may also get involved by supporting lecture sessions that teach critical thinking skills regarding digital literacy and overviewing processes for reporting misinformation.

Conclusion

Exposure to online misinformation poses significant threats, including the implementation of unrealistic social norms, the erosion of community trust, and the reinforcement of negative stereotypes. Adolescents, in particular, are highly impacted due to reliance on external guidance, ongoing identity formation, and the greater environmental effect on shaping ideologies. As representative members of future society, it is crucial to address these issues among young people. They represent the next generation's potential to counteract the spread of false information online.

Mitigating the future impacts of misinformation requires a dual approach. Media platforms must enhance their management strategies to reduce the spread of false information. In conjunction, educational initiatives should be strengthened to help adolescents develop critical thinking abilities and navigate online content. This balanced strategy could help challenge the spread of misinformation and contribute to a safer digital environment.

References

- Baby, M. (2016). Effect of Experiential Learning on Self-Esteem, Resilience and Tolerance for Disagreement. *International Journal of Indian Psychology*, 3(4), 82–90.
<https://doi.org/10.25215/0304.143>
- Blakemore, S.-J., & Robbins, T. W. (2012). Decision-making in the adolescent brain. *Nature Neuroscience*, 15(9), 1184–1191. <https://doi.org/10.1038/nn.3177>
- Duan, Y. (2023). How Can Social Media Play a Role in Combating Fake News. *The International Conference on Interdisciplinary Humanities and Communication Studies*, 4(1), 823–828. <https://doi.org/10.54254/2753-7048/4/2022438>
- Erikson, E. H. (1959). *Identity and the life cycle*. New York Norton.
- Gerbner, G., Gross, L., Morgan, M., & Signorielli, N. (1994). Growing up with television: Cultivation processes. *Journal of Communication*, 100–127.
<https://www.researchgate.net/publication/232498956>
- Hartley, C. A., & Somerville, L. H. (2015). The neuroscience of adolescent decision-making. *Current Opinion in Behavioral Sciences*, 5(1), 108–115.
<https://doi.org/10.1016/j.cobeha.2015.09.004>
- Krasnova, H., Wenninger, H., Widjaja, T., & Buxmann, P. (2013). Envy on Facebook: A Hidden Threat to Users' Life Satisfaction? *11th International Conference on Wirtschaftsinformatik*. <https://www.researchgate.net/publication/256712913>
- Shanmugasundaram, M., & Tamilarasu, A. (2023). The impact of digital technology, social media, and artificial intelligence on cognitive functions: a review. *Frontiers in Cognition*, 2. <https://doi.org/10.3389/fcogn.2023.1203077>
- Tajfel, H., & Turner, J. C. (2004). *Political Psychology Key Readings* (J. T. Jost & J. Sidanius, Eds.; 1st ed.). Psychology Press. <https://doi.org/10.4324/9780203505984-16>

- Welborn, B. L., Lieberman, M. D., Goldenberg, D., Fuligni, A. J., Galván, A., & Telzer, E. H. (2015). Neural mechanisms of social influence in adolescence. *Social Cognitive and Affective Neuroscience*, *11*(1), 100–109. <https://doi.org/10.1093/scan/nsv095>
- Wise, R. A., & Robble, M. A. (2020). Dopamine and Addiction. *Annual Review of Psychology*, *71*(1), 79–106. <https://doi.org/10.1146/annurev-psych-010418-103337>
- World Health Organization. (n.d.). *Combatting misinformation online*. Retrieved August 30, 2024, from <https://www.who.int/teams/digital-health-and-innovation/digital-channels/combating-misinformation-online>
- Wu, L., Morstatter, F., Carley, K. M., & Liu, H. (2019). Misinformation in social media: definition, manipulation, and detection. *ACM SIGKDD Explorations Newsletter*, *21*(2), 80–90. <https://doi.org/10.1145/3373464.3373475>