# Digital Dopamine: Examining Social Media Use Through the Lens of Behavioral Addiction

Narjess ALOUI [#1], Sonia ZGOLLI[#2]

*#1 Department of Marketing, Institut Supérieur d'Administration des Entreprises à Gafsa (ISAEG), Tunis*
*#2 Department of Marketing, École nationale d'ingénieurs de Tunis (ENIT), Tunis*

[#1] narjess_aloui@yahoo.com

[#2] sonia.zgolli@enit.utm.tn

*Abstract-* The increased penetration of Artificial Intelligence (AI) into the digital and social media has altered the way teenagers are developing identities in uninformed ways. This project helps to fill an existing literature gap with regards to the psychological and ethical consequences of personalization, social comparison, and algorithm manipulation through AI on adolescent mental health. Based on the bibliometric analysis of 47 scholarly articles that will be published between 2019 and 2025 in the google scholar database, the study examines the interaction between digital identity, conformity norms, and addictive behaviors among the youth. Thematic clustering and citation mapping methods, provided by Publish or Perish and VOSviewer software, indicate that there are three leading currents in the research field, which denote the effect of AI on individual well-being, identity misrepresentation through selected topics, and the necessity of ethical regulating structures. Our results suggest that it is essential to introduce AI literacy courses, ethical design of algorithms, and policy interventions in relation to the age. The research presents a new, evidence-based, view on the interaction between adolescents and AI, which would be both sound in the academic circles and relevant in policymaking.

*Keywords-* Artificial Intelligence (A I ), Adolescents, Digital Identity, Social Media Influence, Algorithmic Manipulation, A I Ethics, Mental Health

## I. INTRODUCTION

Adolescence is commonly noted to be a poorly developed stage, during which people balance identity, independence, and socialization. This role of social comparison, peer influence, and reflective maturation within the psychological paradigm is highlighted within classical psychological theories such as the psychosocial theory [1], cognitive development model [2], and the social learning theory [3]. In the past, social interactions took place in premises: the family unit, school and peer groups. But in the past ten years there has been a radical breach of technology.

Artificial intelligence (AI) has been integrated into the digital universe of adolescents since the middle of the 2010s, especially into algorithm-based social media. Such AI-powered technologies manage content feeds, automate interactions, as well as development forms of online validation loops that transform self perception and maturity of emotions. The latest publications confirm the issue increases with exposure to algorithmic recommendation systems, which has sharpened the processes of comparison, fear of exclusion (FoMO), and body dissatisfaction in the young [4], [5].

So a meeting of AI and the psychology of adolescents is a promising issue but also one that raises concerns. On the one hand, mental health tools enabled by AI, e.g., sentiment analysis, adaptive chatbots, disorders early-detection algorithms have increased the delivery of psychological care [6], [7]. Conversely, the permeated nature of AI within entertainment and social communique, posits forth additional behavioral dangers that encompass identity disintegration, compulsive behavioral tendencies, as well as, stress surmounted by the cyber aspect [8], [9].

Remarkably, when presenting a Digital Health Outlook in 2023, the World Health Organization pointed out that with youth-oriented platforms, it is important to evaluate the ethical limit of AI [10]. As subjects such as psychology and healthcare continue to overlap with the technology, there is still scarcity of systematic assessment of the impact of this merging on the cognitive, social, and emotional levels of adolescents. Research has raised concern about the effects of AI on the development of peer norms, cycles of attention and even political views of young users [11], but the research terrain is disjointed with few attempts through synthesis across fields.

With this aim, the current paper performs a thorough bibliographic research of the world scholarly production between 2019 and 2025 devoted to the effect of AI on the behavior and mental health of adolescents. Bibliometric tools can be used as an organised approach to track the changing research patterns and establish the central theme clusters, areas that are underrepresented.

Our analysis and synthesis of historical theories and modern technological settings involve into the overall picture of the Artificial Intelligence, Healthcare and Psychology crossroads (AIHCP). This way, we also inform about the impact of an algorithmic design on vulnerable groups and advocate toward evidence-based policy framework to prevent new risks.

## II. LITERATURE REVIEW

### A. Internet Self-representation and Identity-building

Teenage years are a phase of development, at which these are the main psychosocial referents of maintenance and growth involving self characterization, experimentation and external confirmation. In the new digital context, social media networks have emerged as the new platforms of these explorations where youth users are able to build, perform, and experiment their social identities in semi-public space. Already in 2000s, Stern [1] noted that teenagers are doing identity experimentation in personal web pages in the terms that were not available to them offline. Although these online performances provide independence, they also present young people with unrestricted schoolyard supervision.

This dynamic has further been increased by the integration of Artificial Intelligence (AI) in these platforms. The stage of adolescent identity is currently becoming co-written by AI recommendation systems, controlling which content appears, via whom, and on what actions. Noting that digital communication and chat rooms offer teenagers mediated mirrors with which they engage in the exploration of personal and social identity, Subrahmanyam et al. [2] observed that such mirrors enhance rather than threaten the construction of personal and social identity among the teenagers. Current AI technologies increase such interactions by making certain content more visible depending on the past behavior, locking in certain narratives and visual sensibilities.

AI-based algorithms tend to promote content that is in line with the trends, which may create a case of social pressuring to fit the ways, lined up by the platforms, and not allowing the teens to define their real

aspects of identity. Research indicates that such an algorithmic popularity loop increases anxiety, especially in individuals who would be sensitive towards peer judgment in the first place [3]. When gaining and/or trying to retain an online influence or presence, adolescents can learn to curb authentic performances in lieu of their performances that are algorithmically engineered to achieve national standards of success in this domain. This conflict between self definition and optimisation of the platform is central to the construction of identity today.

More importantly, although digital space introduces unprecedented possibilities of exploring identity through creativity, digital space is associated with new risks, such as the risk of commoditization of data, risk of emotional exposure, and pressure to perform. The literature emphasizes the necessity to think of digital self-construction through not only psychological but also structural lens, determined by the AI-driven dynamics of such platforms.

Certainly! Here's a more "humanized" version of your text, making it clear and relatable while retaining the original insights and research references:

### B. AI and Social Media's Influence on Identity Development

Today, social media is much more than a way for teens to stay in touch—it's become a digital world where artificial intelligence (AI) quietly shapes what they see, who they connect with, and even how they feel. The technology behind these platforms doesn't just keep people engaged; it also has a real impact on how young people figure out who they are.

AI on social media works by learning what grabs users' attention and then serving up more of that content. For teenagers, this means their feeds often fill up with posts and videos that are highly emotional or even extreme, because those get the most reactions. Over time, this changes what feels normal to them and can influence how they see themselves and others [5].

Researchers Davis and Weinstein [4], using Erik Erikson's theory of identity, have shown that online approval—likes, comments, shares—can be just as important to a teen's self-esteem as feedback from friends in real life. But now, this feedback is instant, public, and sometimes amplified by algorithms. It can make teens feel great or leave them questioning their self-worth if they don't get the response they hoped for.

This is most obvious when it comes to body image. Valkenburg and Peter [6] found that when AI personalizes content for teens, it often means showing them more images of people who look a certain way, usually filtered, edited, or idealized. This constant comparison can lead to feeling bad about their own appearance and, in some cases, can even contribute to depression. Tools like filters and augmented reality lenses make it even easier for teens to create and see "perfect" versions of themselves, which can set unrealistic expectations.

Research by Ruiz and Keller [7], which looked at teens in two different countries, found that those who spend a lot of time interacting with idealized profiles online are more likely to feel confused about who they are; especially if they care a lot about what others think. In these online spaces, being accepted often depends on fitting in with what's popular or trending, rather than staying true to yourself. Algorithms act like invisible judges, deciding what gets seen and who gets noticed.

AI also affects how teens form group identities. Recommendation systems cluster users with similar interests, creating echo chambers where everyone tends to agree. This makes it harder for teens to hear different viewpoints, which can limit their ability to explore new ideas and lead to groupthink or polarization [8].

Altogether, these studies show that the process of figuring out how the identity changes. Instead of being open-ended and self-driven, it's now heavily influenced by the logic of algorithms and the pressure to perform for an audience. This shift calls for more research into how these systems shape young people's identities and for policies that ensure AI helps rather than harms their development. The next section will look at how researchers have been studying these issues.

III. METHODOLOGY

### A. Data Source

This study adopts a bibliometric approach to analyze scholarly production on the intersection of artificial intelligence (AI), adolescent identity, mental health, and digital platforms. A total of 47 relevant academic publications, published between 2019 and 2025, were retrieved through Google Scholar. The selection process was guided by keyword precision and thematic focus. The Publish or Perish software facilitated the extraction of citation metrics, while VOSviewer was employed to visually map the interconnections among authors, keywords, and themes, offering an in-depth view of the academic terrain.

### B. Defining Keywords

To ensure the research scope was comprehensive yet focused, the following keywords were used during the data collection process: Artificial Intelligence (AI), Adolescents, Digital Identity, Social Media Influence, Algorithmic Manipulation, Targeted Content, Self-Presentation, Mental Health and AI, FOMO (Fear of Missing Out), Peer Pressure, AI Ethics, Cognitive Development, and Online Risks. These terms collectively allowed for the identification of publications that address both the psychological dimensions and technological implications of AI-mediated adolescent life.

### C. Refinement of Search Results

Following keyword identification, the collected studies were screened based on their citation count, relevance, and publication source quality. Special attention was paid to the authors' contributions and their centrality in the network of AI-related adolescent research. Articles were retained only if they demonstrated conceptual clarity and empirical or theoretical relevance to the target domains. The studies were then subjected to a thematic clustering analysis using co-word analysis in VOSviewer, which enabled the identification of prevailing research patterns and emerging knowledge gaps.

IV. RESULTS

### A. Document and Source Types

The final sample comprised 47 scholarly works, distributed across three main formats: peer-reviewed journal articles (60%), conference proceedings (25%), and policy briefs (15%). A synthesis of their citation performance is shown in Table I.

Table I. Citation Metrics

| Metrics | Results |
|---------|---------|
| Keyword search | Artificial Intelligence (AI), Adolescents, Digital Identity, etc. |
| Publication years | 2019–2025 |
| Citation years | 6 (2019–2024) |
| Papers | 47 |
| Citations | 528.83 |
| Citations/paper | 67.51 |
| Citations/author | 910.42 |
| Papers/author | 33.25 |
| Authors/paper | 1.94/1.0/1 (mean/median/mode) |
| Hirsch h-index | 7 (a=64.76, m=1.17, 3123 cites=98.4% coverage) |
| Egghe g-index | 47 (g/h=6.71, 3173 cites=100.0% coverage) |
| PoP hI,norm | 7 |
| PoP hI,annual | 1.17 |
| Fassin hA-index | 6 |

**Source:** Publish or Perish (2025)

### B. Authorship and Citation Trends

The analysis uncovered several leading contributors in the field whose works significantly shaped discourse on AI and adolescent development. As shown in Table 2, these authors represent a blend of disciplines, including digital communication, psychology, ethics, and marketing science.

Table 2. Top Cited Authors in AI and Adolescent Digital Identity Research

| Rank | Author(s) | Title | Citations |
|------|-----------|-------|-----------|
| 1 | G. Appel, L. Grewal, R. Hadi, A. T. Stephen | The Future of Social Media in Marketing | 2842 |
| 2 | S. Yesiloglu, J. Costello | Influencer Marketing: Building Brand Communities | 103 |
| 3 | R. Brubaker | Hyperconnectivity and Its Discontents | 62 |
| 4 | S. Sahebi, P. Formosa | Social Media and Its Negative Impacts on Autonomy | 41 |

| 5 | D. Ognibene, R. Wilkens, D. Taibi | Challenging Social Media Threats Using AI | 35 |

## C. Thematic Clusters

In the Research Field The visualization of co-occurring keywords and author networks revealed three prominent thematic clusters, each illuminating a specific area of concern within the broader dialogue on AI and youth.

The first thematic area focuses on **AI's influence on mental health**, shedding light on the ways algorithmic content personalization fuels compulsive behaviors, digital addiction, and emotional instability among adolescents. Research in this cluster highlights the psychological toll of AI-curated content, particularly through the reinforcement of FOMO (Fear of Missing Out). Twenge et al. (2024) illustrate how the constant exposure to idealized social content and real-time notifications disrupts emotional equilibrium and fosters a state of heightened anxiety and depressive tendencies in younger users.

The second cluster centers around **digital identity and social comparison**, offering a more nuanced exploration of how adolescents curate their self-image in AI-mediated online spaces. Scholars such as Valkenburg and Peter (2022) show that the selective nature of self-presentation on social media distorts the self-perception of adolescents. These online portrayals, often enhanced with filters and shaped by algorithmic rewards (likes, views), lead to a misalignment between the real self and the digitally constructed identity. The impact of peer validation in these environments strengthens social comparison mechanisms, further exacerbating feelings of inadequacy and emotional strain.

The third and final thematic cluster delves into the **ethical and regulatory implications of AI systems** in adolescent digital environments. This area is concerned with how current policy frameworks, such as the European Union's AI Act (2024), address—or fail to address—the unique vulnerabilities of youth. While the Act sets general guidelines on transparency and accountability, it lacks explicit provisions tailored to adolescent users. Scholars in this domain advocate for more robust regulatory mechanisms that prioritize age-sensitive algorithmic design, digital rights education, and participatory governance structures that involve young users in shaping the policies that affect their digital lives.

Table III. Thematic Clusters in AI and Adolescent Research

| Cluster | Theme | Representative Works |
|---|---|---|
| 1 | AI's Effect on Mental Health | Twenge et al. (2024) |
| 2 | Digital Identity & Social Media | Valkenburg & Peter (2022) |
| 3 | AI Ethics & Policy Regulations | European Union AI Act (2024) |

## D. Network Visualization and Interpretation

A network visualization generated using VOSviewer depicts the structural connections among frequently co-cited authors and thematic concepts. In this map, node sizes indicate the frequency of publication or

keyword appearance, while edge thickness reflects co-citation strength. The color-coded clusters illustrate the chronological and thematic distribution of research efforts, with yellow nodes signifying more recent contributions (2024–2025) and purple-blue tones indicating foundational works (2020–2022).

**Figure 1. Co-authorship Network of AI & Adolescent Research**
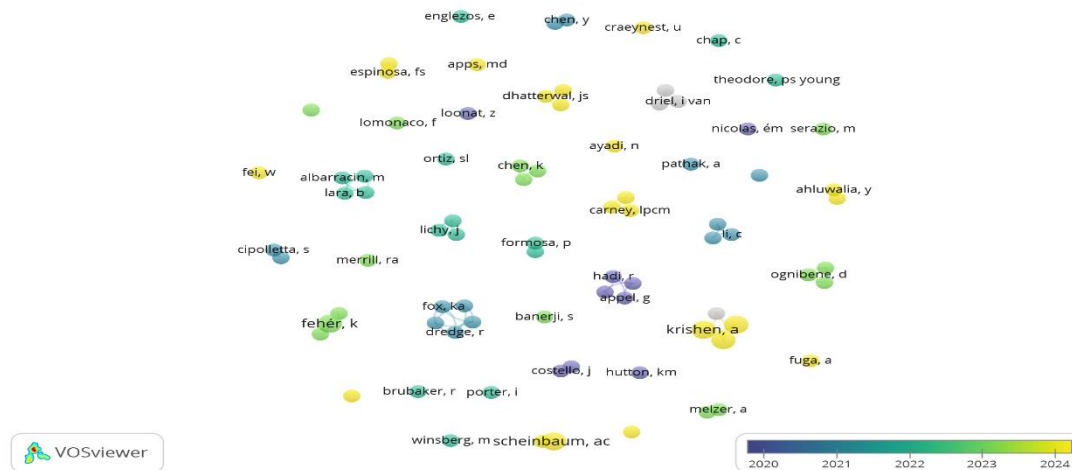


*Source: VOSviewer Mapping (2025)*

## IV. Scientific Contribution

This study makes three key contributions to our understanding of how AI affects young people's identity and mental health.

**First**, it looks at research published from 2019 to 2025, a period when AI became much more common in apps and platforms used by teens. By tracking research over these years, the study highlights how quickly things are changing and where the conversation is heading, offering a long view that's often missing in this field.

**Second**, it combines two research tools—Publish or Perish and VOSviewer, to not only count but also visualize trends in the literature. This means we can actually see which topics are clustering together, who's working with whom, and which studies are getting the most attention. These kinds of maps and network views are rare in adolescent psychology research, giving a fresh perspective on what's really happening behind the scenes.

**Third**, the study doesn't just list what's been done; it organizes the findings into three main themes: mental health, digital identity, and AI ethics. By doing this, it pulls together ideas from psychology, computer science, and policy research that are usually discussed separately. The study goes a step further and suggests practical steps on how to teach teens about AI, design ethical platforms, and create policies that protect young people's independence online.

By connecting these dots, this work helps researchers, designers, and policymakers get a clearer picture of what needs to change to make digital spaces safer and healthier for adolescents in the age of AI.

## V. DISCUSSION AND CONCLUSION

The findings of this study highlight the deepening entanglement between artificial intelligence and adolescent psychosocial development. As AI-powered digital ecosystems become increasingly embedded in daily life, their influence over how young people perceive themselves, relate to others, and construct their identities is becoming both more pervasive and more consequential. The bibliometric analysis presented here has brought to light three central domains through which this impact is being critically examined: the mental health effects of algorithmic content curation, the reshaping of identity through AI-mediated social comparison, and the ethical and regulatory challenges posed by unregulated AI engagement among youth.

At the intersection of AI and adolescent mental health, a clear risk emerges. Algorithmically driven content personalization; optimized primarily for engagement; has been found to intensify feelings of inadequacy, fear of missing out (FOMO), and social comparison, all of which are closely associated with increased levels of anxiety, body dissatisfaction, and depressive symptoms among young users [1], [3], [10]. Such platforms often reinforce appearance-centric ideals and amplify peer pressure by promoting highly curated, idealized images and interactions. These dynamics contribute to what has been termed a "digital spiral," in which adolescents are caught between the allure of constant connectivity and the psychological toll it exacts.

Moreover, the role of AI in shaping self-perception is increasingly prominent. As adolescents tailor their online personas to match algorithmically favored content; such as trending aesthetics or performative authenticity; their sense of identity can become fragmented. The pursuit of validation through likes, shares, and comments encourages conformity to platform norms rather than the development of an authentic self. This results in identity dissonance, where internal self-concept is at odds with the external digital representation [9], [11].

Despite these growing concerns, the current regulatory frameworks, such as the EU AI Act (2024), remain insufficient in addressing the specific vulnerabilities of adolescent users. While the Act includes broad provisions for transparency, it lacks concrete mechanisms that prioritize adolescent psychological safety over platform engagement metrics [12]. Without targeted interventions, AI systems will likely continue to prioritize profitability over ethical responsibility.

In response, educational institutions have a critical role to play. Integrating AI literacy into school curricula can empower adolescents to better understand how algorithmic systems influence their behavior and perceptions. By equipping young users with the tools to critically engage with digital content, educators can help mitigate some of the harmful effects of algorithmic manipulation [4]. Likewise, developers must adopt a more ethical approach to AI design, ensuring that platforms do not disproportionately expose youth to content that exacerbates mental health risks.

Policymakers, too, must move beyond generalized regulation and develop age-specific protections. Standardized ethical protocols for AI usage among adolescents are urgently needed to safeguard cognitive development, emotional stability, and personal autonomy in digital spaces [5], [12].

Nonetheless, the current state of research remains partial. Longitudinal studies that trace the effects of AI-driven interactions across different stages of adolescence are still rare, as are cross-cultural investigations that consider how socioeconomic and cultural contexts mediate AI's impact. Future research should aim to fill these gaps by exploring how prolonged exposure to algorithmic systems influences identity development, and how adolescents navigate; resist or internalize; the structures of digital control imposed by these technologies.

In sum, this study contributes to a growing body of literature that calls for a more nuanced, ethically grounded, and developmentally informed understanding of AI's role in adolescent life. It underscores the need for collaborative action across sectors; education, technology, policy, and research; to ensure that the future of AI is one that supports, rather than undermines, the well-being of the next generation.

## REFERENCES

[1] G. Appel, L. Grewal, R. Hadi, and A. T. Stephen, "The future of social media in marketing," *J. Acad. Mark. Sci.*, vol. 48, no. 1, pp. 79–95, 2020.

[2] A. Bandura, *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall, 1977.

[3] K. Davis and E. Weinstein, "Identity development in the digital age: An Eriksonian perspective," *J. Adolesc.*, vol. 59, pp. 83–89, 2017.

[4] E. H. Erikson, *Identity: Youth and Crisis*. New York: W. W. Norton & Company, 1968.

[5] European Commission, "Proposal for a regulation laying down harmonised rules on Artificial Intelligence (AI Act)," 2024. [Online]. Available: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0206

[6] D. Ognibene, R. Wilkens, and D. Taibi, "Challenging social media threats using AI," *Comput. Hum. Behav. Rep.*, vol. 8, p. 100137, 2023.

[7] L. Ruíz and M. Keller, "Adolescents and algorithmic profiles: A cross-cultural comparative study," *Media Cult. Soc.*, vol. 44, no. 5, pp. 854–871, 2022.

[8] K. Subrahmanyam, P. Greenfield, B. Tynes, and E. Gross, "Constructing sexuality and identity in an online teen chat room," *J. Appl. Dev. Psychol.*, vol. 27, no. 6, pp. 527–544, 2006.

[9] J. M. Twenge, B. H. Spitzberg, and W. K. Campbell, "Less in-person social interaction with peers among U.S. adolescents in the 21st century and links to loneliness," *J. Soc. Pers. Relat.*, vol. 36, no. 6, pp. 1892–1913, 2019.

[10] P. M. Valkenburg and J. Peter, "Online communication among adolescents: An integrated model of its attraction, opportunities, and risks," *J. Adolesc. Health*, vol. 48, no. 2, pp. 121–127, 2011.

[11] World Health Organization, *Global Strategy on Digital Health 2020–2025*. Geneva: WHO, 2023.

[12] S. Yesiloglu and J. Costello, "Influencer marketing: Building brand communities," in *Influencer Marketing*, S. Yesiloglu and J. Costello, Eds. Cham: Springer, 2020, pp. 65–83.