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## Adolescents' digital micro-identities: A narrative review of identity exploration, regulation, and integration in online contexts

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### Abstract

Adolescence is characterized by identity exploration and sensitivity to social evaluation. Digital environments provide adolescents opportunities to experiment with multiple forms of self-representation. This review synthesized literature on adolescents' digital self-representations to conceptualize micro-identities as temporary, context-specific digital selves that support identity exploration and integration. Literature was identified through database searches focusing on adolescents' digital self-presentation and online identity processes. Studies were synthesized to integrate developmental identity theory with cyberpsychology perspectives. The literature suggests adolescents use avatars and online personas as micro-identities for exploration and regulation, enabling role experimentation and emotion management. However, these present challenges of fragmentation and identity coherence. Conceptualizing digital self-representations as micro-identities provides a framework for understanding adolescents' online behavior. Integrative models accounting for sociocultural contexts are essential for advancing research and practice.

**Keywords:** Adolescence, digital identity, micro-identities, online self-presentations, narrative review

### 1. Introduction

Adolescence is a key stage for identity formation, where individuals explore roles and values before developing a stable identity (Erikson, 1968; Marcia, 1980) <sup>[7, 14]</sup>. Abstract reasoning and socioemotional development increase adolescents' sensitivity to social evaluation and belonging (Steinberg and Morris, 2001; Blakemore and Mills, 2014) <sup>[22, 3]</sup>. Growing autonomy from parents and increased peer influence drive the testing of multiple self-representations. Digital platforms have expanded identity exploration, allowing adolescents to experiment with personas with minimal real-world impact. These create micro-identities contextual self-representations through avatars and online personas, though their developmental effects remain understudied. Reviews of adolescents' digital self-presentation lack theoretical unity, focusing on social media outcomes rather than identity development. Studies often combine adolescent and adult samples, while treating digital self-representations as static rather than dynamic processes.

This review integrates developmental identity theory with cyberpsychology to conceptualize digital self-representations as micro-identities. It aims to clarify distinctions between digital identities, analyze their psychological functions, and propose a research framework.

### 2. Methods: Narrative and review approach

#### 2.1 Literature search strategy

Relevant literature was identified through Scopus, Web of Science, and Google Scholar searches. The search terms included combinations of *adolescence*, *digital identity*, *online self-presentation*, *avatars*, *social media*, and *identity development*. The search prioritised peer-reviewed articles published from 2000 onwards to capture contemporary digital contexts.

#### 2.2 Inclusion and Exclusion criteria

Studies examined adolescents' digital self-representation, identity processes, or psychosocial outcomes online. Both qualitative and quantitative studies are included. Studies on adults or

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unrelated to identity were excluded.

### 2.3 Data Synthesis

Consistent with the narrative review methodology, the findings were synthesised thematically rather than statistically. The review emphasised conceptual integration across disciplines, identifying recurring themes, theoretical perspectives, and methodological patterns relevant to adolescent identity development.

## 3. Conceptualizing Micro identities in Adolescent digital context

### 3.1 Definitions used across studies

Research defines adolescents' digital self-representations through constructs like online identity, digital self, virtual identity, and self-presentation. These definitions focus on observable behaviors and platform-specific expressions rather than identity as a developmental process (Erikson, 1968 Valkenburg and Peter, 2011) [7, 25], leaving micro-identities implicitly referenced but not explicitly conceptualized.

### 3.2 Distinctions between avatars, personas and roles

Literature distinguishes digital self-representations by context. Avatars are graphical representations allowing identity experimentation (Fox and Bailenson, 2009; Przybylski *et al.*, 2012) [8, 19]. Online personas are curated

self-presentations on social media (Goffman, 1959; Zhao *et al.*, 2008) [9, 26]. Digital roles reflect platform-specific behaviors. These forms lack unified developmental analysis.

### 3.3 Theoretical framing of digital self-representations

Digital self-representations are framed through self-presentation theories emphasizing strategic performance (Goffman, 1959) [9]. Studies viewed avatars through possible selves for exploring idealized self-concepts (Markus and Nurius, 1986) [16]. Narrative identity theories remain underutilized (Marcia, 1980; McAdams, 2001) [14, 17].

### 3.4 Refined definition of micro-identity (Proposed)

This review defined micro-identities as temporary, context-specific self-representations in digital environments that help adolescents explore aspects of self. Unlike stable identity commitments, micro-identities are flexible and situational, functioning as developmental tools during adolescence. Digital self-representations include avatars, online personas, and role-based identities, examined through self-presentation (Goffman, 1959) [9], possible selves (Markus and Nurius, 1986) [16], and online self-disclosure frameworks (Valkenburg and Peter, 2011); Subrahmanyam and Šmahel, 2011) [25, 23]. These constructs differ in functions, stability, and developmental relevance. Table 1 shows how avatars, personas, digital roles, and micro-identities operate in adolescent identity development.

**Table 1:** Comparison of digital self-representations in adolescence

Dimension	Avatars	Online Personas	Digital Roles	Micro-Identities (Proposed)
Definition	Customizable graphical or embodied representations in virtual environments	Curated self-presentations on social media platforms	Context-specific behavioral identities shaped by platform norms	Temporary, context-specific, and reversible digital self-representations
Primary Contexts	Video games, virtual worlds, VR	Social networking and content-sharing platforms	Online communities, gaming networks	Multiple digital platforms
Primary Function	Experimentation with appearance and abilities	Impression management and social signaling	Social adaptation within specific groups	Identity exploration, regulation, and self-expression
Temporal Stability	Session-based or persistent within a platform	Relatively stable but continuously curated	Situational and role-bound	Highly flexible and transient
Multiplicity	Typically, single per context	Multiple across audiences and platforms	Multiple across social contexts	Explicitly multiple and shifting
Relation to Offline Identity	Experimental or symbolic reflection	Partial overlap or idealization	Weak or situational linkage	Dynamic interaction supporting identity integration
Developmental Relevance	Supports role experimentation	Enables social feedback and identity testing	Facilitates peer belonging	Serves as a developmental mechanism for exploration and regulation
Common Measurement	Avatar customization metrics	Self-report measures of self-presentation	Behavioral observation	Multi-method (behavioral, self-report, narrative)

**Note:** This table was developed by the author based on a synthesis of prior literature on digital identity, self-presentation, and role enactment

## 4. Operationalization of micro-identities in adolescence

Building on the conceptual distinctions presented in Table 1, micro-identities were operationalised as dynamic, context-specific digital self-representations that adolescents used for exploration, regulation, and social engagement. Unlike avatars, online personas, or digital roles, which are often measured through platform-specific behaviours alone, micro-identities require a multi-dimensional assessment capturing both observable actions and developmental functions.

### 4.1 Behavioral Indicators

Operational measures included platform behaviors like avatar customization, profile updates, posts, and peer interactions. In gaming, adolescents' avatar choices serve as proxies for identity experimentation. On social media, self-

presentation through selective disclosure and content curation shapes online micro-identities. These indicators overlapped with Table 1 constructs, but micro-identities emphasized flexibility and multiplicity.

### 4.2 Psychological and Developmental Functions

Micro-identities were assessed for psychological functions like self-exploration, emotion regulation, and self-rehearsal. Self-reported instruments and interviews captured adolescents' experiences of testing alternative traits and integrating online experiences into identity development. Narrative analysis of avatars provided insights into how these representations support identity formation.

### 4.3 Integration across platforms and Contexts

Micro identities were evaluated for contextual variability

and cross-platform coherence. Unlike single-platform avatars, micro-identities shifted across digital environments, reflecting adolescents' engagement with different social audiences. Mixed-method approaches combining behavioral logging, surveys, and narratives helped capture this multidimensionality, bridging between static avatars and the dynamic construct of micro-identity.

### Linking to Table 1

Table 1 shows distinctions between avatars, online personas, digital roles, and micro-identities. Measuring micro-identities requires assessing their unique features: temporality, context sensitivity, exploratory function, and developmental integration. Unlike studies focused on avatars or social media profiles, capturing micro-identities combines behavioral, psychological, and contextual indicators to reflect identity exploration in adolescence.

## 5. Psychological motivations for adolescent micro-identities

Adolescents were particularly motivated to experiment with multiple online micro-identities because of the developmental tasks of autonomy, social belonging, exploration, and self-expression.

### 5.1 Autonomy and Self-Determination

Adolescents seek increasing independence from parental or adult oversight, and digital environments provide low-risk spaces for autonomous self-presentation (Steinberg, 2005; Ryan and Deci, 2000) <sup>[21, 20]</sup>. Micro-identities allow adolescents to make choices about how they appear, behave, and interact online, supporting agency and control over their emerging sense of self.

### 5.2 Belonging and Peer Affiliation

Peer approval and social acceptance are central to adolescent development (Baumeister and Leary, 1995; Allen and Brown, 2018) <sup>[2, 1]</sup>. Maintaining multiple micro-identities enables adolescents to adapt to different social groups, manage impressions for diverse audiences, and strengthen feelings of belonging in online communities, gaming networks, or social media platforms.

### 5.3 Exploration and Identity Experimentation

Drawing from Erikson's (1968) <sup>[7]</sup> and Marcia's (1980) <sup>[14]</sup> identity frameworks, adolescents used micro-identities to experiment with roles, traits, and values in a flexible, reversible manner. Digital contexts allow them to test alternative selves ideal, feared, or hypothetical without permanent consequences, facilitating the critical developmental process of identity exploration.

### 5.4 Self-Expression and Emotional Expression

Micro-identities give adolescents tools for expressing interests, emotions, and values constrained offline. Digital avatars serve as outlets for creativity and emotional disclosure (Subrahmanyam and Šmahel, 2011; Davis, 2013) <sup>[23, 6]</sup>. Through micro-identities, adolescents can practice social interactions and experiment with self-presentation within supportive digital contexts.

### 5.5 Integration across motivations

These motivations often operate together: An adolescent may develop micro-identities to explore roles, engage with

peers in social media (belonging), and express creativity while exercising autonomy. This multiplicity shows the interaction between developmental drives and digital platform affordances (Valkenburg and Peter, 2011; Manago *et al.*, 2008) <sup>[25, 6]</sup>.

## 6. Avatars and Online personas as tools for identity exploration

Adolescence is a peak period for identity exploration (Erikson, 1968; Marcia, 1980) <sup>[7, 14]</sup>. Digital environments provide unique affordances that allow adolescents to experiment with multiple facets of the self in ways that are temporally flexible, reversible, and socially mediated.

### 6.1 Avatars as Experimentation Platforms

Avatars are graphical digital representations used in gaming and virtual environments (Fox and Bailenson, 2009) <sup>[8]</sup>. Adolescents use avatars to explore unexpressed characteristics, like shy individuals adopting outgoing personas. This aligns with Erikson's identity versus role confusion stage (Erikson, 1968) <sup>[7]</sup>. Research shows that adolescents who customize avatars engage more in self-exploration (Przybylski *et al.*, 2012; Fox and Bailenson, 2009) <sup>[19, 8]</sup>.

### 6.2 Online Personas as Identity Laboratories

Online personas represent curated self-presentations on social media (Goffman, 1959; Zhao *et al.*, 2008) <sup>[9, 26]</sup>. Adolescents experiment with personas to assess peer reactions and social feedback, aligning with Marcia's (1980) <sup>[14]</sup> concept of exploration. Through social interactions, they express constrained offline identities and interests (Davis, 2013; Subrahmanyam and Šmahel, 2011) <sup>[6, 23]</sup>.

### 6.3 Mechanisms of Self-Experimentation

Digital platforms allow adolescents to try multiple identities and revise them based on peer feedback. These online experiences with avatars shape their self-concept and social confidence through reflection and refinement over time.

### 6.4 Synthesis

Avatars and online personas enable identity exploration, allowing adolescents to test potential selves. This supports Eriksonian tasks of role experimentation and identity consolidation, highlighting how micro-identities bridge online and offline development.

## 7. Regulatory Functions of Micro-Identities

Micro-identities facilitate identity exploration and play a regulatory role during adolescence—a stage marked by emotional reactivity, social sensitivity, and developing executive control (Steinberg, 2005) <sup>[21]</sup>. Digital environments allow adolescents to manage emotional states and social stressors through multiple micro-identities.

### 7.1 Emotional Regulation

Micro-identities help adolescents regulate emotions through digital expression or suppression. Anonymous personas enable vulnerability sharing without offline judgment (Subrahmanyam and Šmahel, 2011) <sup>[23]</sup>, while avatars provide emotional distance through symbolic representation (Fox and Bailenson, 2009) <sup>[8]</sup>, aligning with cognitive reappraisal (Gross, 1998) <sup>[10]</sup>.

## 7.2 Social Regulation and Impression Management

Adolescents adapt micro-identities across platforms through selective self-presentation, balancing authenticity with social desirability for peer acceptance (Goffman, 1959; Zhao *et al.*, 2008) <sup>[9, 26]</sup>. Multiple micro-identities help reduce interpersonal conflict during heightened peer sensitivity.

## 7.3 Identity Regulation and Self-Coherence

Micro-identities shape self-concept development as adolescents experiment with traits while maintaining flexibility to modify unsuccessful self-representations. This adaptability reduces identity failure costs (Erikson, 1968 <sup>[7]</sup>; Marcia, 1980) <sup>[7, 14]</sup>. Narratives integrate experiences into meaning systems, connecting micro-identities with offline identities (McAdams, 2001) <sup>[17]</sup>.

## 7.4 Coping and Psychological Resilience

Digital micro-identities provide adolescents control in stressful situations. Avatar environments can buffer academic pressure (Przybylski *et al.*, 2012) <sup>[19]</sup>, but overreliance increases disengagement from offline challenges, requiring balanced use.

## 7.5 Developmental Implications

Micro-identities reflect adolescents' management of emotional arousal and identity uncertainty. When supported by reflection and relationships, they can enhance self-regulation. However, fragmented micro-identities may lead to identity diffusion. Longitudinal research is needed to understand development.

## 8. Developmental outcomes of micro-identity formation

Digital micro-identities shape adolescents' psychosocial development through feedback cycles, impacting their identity coherence, social competence, and emotional well-being. These outcomes depend on how adolescents integrate their digital self-representations.

### 8.1 Identity Development and Self-Concept Clarity

Micro-identities allow adolescents to explore roles in low-risk settings (Erikson, 1968; Marcia, 1980) <sup>[7, 14]</sup>, enhancing self-reflection. Online self-presentation strengthens self-concept (Manago *et al.*, 2008; Davis, 2013) <sup>[13, 6]</sup>, though identity diffusion can occur when feedback is inconsistent (Valkenburg and Peter, 2011) <sup>[25]</sup>.

### 8.2 Social Competence and Peer Relationships

Micro-identities enable adolescents' social interactions and impression management online. Digital communities enhance social skills and peer connections (Subrahmanyam and Šmahel, 2011) <sup>[23]</sup>. While positive feedback builds confidence, idealized personas may increase anxiety and peer pressure (Nesi and Prinstein, 2015) <sup>[18]</sup>.

### 8.3 Emotional well-being and Psychological Adjustment

Micro-identities enable emotional regulation and expression, supporting well-being (Gross, 1998; Przybylski *et al.*, 2012) <sup>[10, 19]</sup>. Avatar engagement may enhance competence while reducing stress. However, excessive online validation may increase emotional dysregulation (Kross *et al.*, 2013) <sup>[12]</sup>.

### 8.4 Cognitive and Self-Regulatory Development

Adolescents' management of micro-identities requires monitoring audience expectations and adapting self-presentation across contexts. These processes engage

executive functions and metacognition, supporting self-regulation development (Steinberg, 2005) <sup>[21]</sup>. While prolonged engagement enhances behavioral monitoring, managing multiple identities across platforms may increase cognitive load, especially in social media environments.

## 8.5 Long-Term Developmental Trajectories

Studies indicate adolescents who integrate digital experiences into self-narratives show better identity consolidation and adjustment (McAdams, 2001; Kroger *et al.*, 2010) <sup>[17, 11]</sup>. The impact of micro-identities depends on exploration-integration balance and supportive offline contexts.

## 9. Micro-Identities and identity integration across adolescence

While micro-identities enable flexible exploration and self-regulation, adolescents' development requires integrating multiple self-representations into a coherent sense of identity. Identity integration refers to how diverse roles, experiences, and self-aspects are organised into a meaningful self-concept (Erikson, 1968; McAdams, 2001) <sup>[7, 17]</sup>. Digital environments have influenced this process by offering adolescents platforms for enacting and reflecting on micro-identities.

### 9.1 Fragmentation versus coherence

Adolescents maintain multiple digital identities across platforms. This may enhance perceived fragmentation as they shift between distinct self-presentations (Goffman, 1959; Zhao *et al.*, 2008) <sup>[9, 26]</sup>. However, fragmentation is not maladaptive, as developmental models show temporary inconsistency is normal in identity exploration (Marcia, 1980) <sup>[14]</sup>. These micro-identities enable adolescents to differentiate aspects of self before integration.

### 9.2 Narrative Processes and Meaning-Making

Adolescents maintain multiple digital identities across platforms, enhancing fragmentation as they shift between distinct self-presentations (Goffman, 1959; Zhao *et al.*, 2008) <sup>[9, 26]</sup>. Fragmentation isn't inherently maladaptive. Developmental models show inconsistency is normative in identity exploration (Marcia, 1980) <sup>[14]</sup>. Micro-identities help differentiate aspects of self before integration.

### 9.3 Cross-Context Consistency and Flexibility

Identity integration balances consistency and adaptive flexibility across contexts. Adolescents with integrated micro-identities maintain core values while adapting their self-presentation in digital environments. Excessive compartmentalisation can lead to role confusion (Erikson, 1968) <sup>[7]</sup>. Studies show that coherence across domains predicts psychological well-being (Kroger *et al.*, 2010) <sup>[11]</sup>.

### 9.4 Developmental Timing and Trajectories

Early adolescence involves experimentation and identity shifts, reflecting peer sensitivity (Steinberg, 2005) <sup>[21]</sup>. During mid-to-late adolescence, cognitive control helps integrate digital and offline identities. However, longitudinal research evidence for these developments remains limited.

### 9.5 Implications for healthy identity development

Micro-identities enable safe experimentation when supported by reflective practices and balanced digital use.



Unregulated digital spaces fragment self-concepts, while interventions promoting digital reflection enhance development.

## 10. Sociocultural and Algorithmic Moderators

Micro-identity formation occurs within broader sociocultural systems and algorithmic infrastructure. Cultural norms, peer dynamics, socioeconomic factors, and platform design shape how adolescents construct and maintain their micro-identities. These contextual factors are key to understanding developmental outcomes.

### 10.1 Sociocultural Contexts and Identity Norms

Cultural values shape adolescents' online self-expression and privacy. Collectivistic cultures emphasize group harmony, while individualistic ones favor personal expression (Markus and Kitayama, 1991) [15]. Gender, race, and community norms influence micro-identities, which marginalized youth use to explore identity while facing surveillance (Boyd, 2014; Tynes *et al.*, 2015) [4, 24].

### 10.2 Peer Ecology and Social Capital

Platform norms shape adolescents' self-expression and information disclosure through social feedback (Nesi and Prinstein, 2015) [18]. Digital resources and tech literacy affect identity experimentation, while peer networks influence micro-identity adoption.

### 10.3 Algorithmic Curation and Visibility Dynamics

Algorithmic systems shape content visibility and social exposure, determining which micro-identities gain prominence. Personalised feeds create loops that stabilise identity performances and limit diversity (Cotter, 2019) [4]. Adolescents adapt their micro-identities to algorithmic preferences, optimising content to maximise engagement.

### 10.4 Datafication, Surveillance, and Identity Risk

Digital trace persistence limits online identity reversibility. Online traces remain searchable and monetised, raising privacy concerns. Adolescents may self-censor to manage surveillance, affecting exploration.

### 10.5 Developmental Implications and Research Gaps

Sociocultural inequalities and algorithmic systems affect adolescent development. Limited research combines sociotechnical and developmental analysis. Future studies should examine adolescents' experiences with algorithmic moderation using platform analytics.

## 11. Methodological Trends and Limitation

### 11.1 Dominance of cross-sectional self-report designs

Research on adolescents' digital self-representations spans multiple disciplines. Despite insights, the field remains fragmented in design and measurement. Most studies use cross-sectional surveys to assess social media use and identity correlates (Valkenburg and Peter, 2011; Nesi and Prinstein, 2015) [25, 18]. These enable large-scale sampling but limit causal inference. Self-report measures face bias, while instruments often measure digital identity through frequency rather than multiplicity or function.

### 11.2 Experimental and platform-specific paradigms

Experimental designs in avatar research manipulate visual features to study psychological effects (Fox and Bailenson,

2009; Przybylski *et al.*, 2012) [8, 19]. While these studies provide causal insights, they lack ecological validity and simplify identity processes. Studies focusing on single platforms limit generalisability by ignoring cross-platform dynamics.

### 11.3 Limited Longitudinal and Developmentally Sensitive Research

Longitudinal studies on digital identity development in adolescence remain limited. Current research focuses on general identity development rather than digital micro-identities (Kroger *et al.*, 2010) [11]. The developmental patterns and outcomes of microidentity use are poorly understood, with age-related differences often oversimplified across adolescent stages.

### 11.4 Fragmented qualitative and Mixed-methods approaches

Qualitative studies have revealed adolescents' experiences and motivations of online self-representation (Davis, 2013; Subrahmanyam and Šmahel, 2011) [6, 23]. However, varied analytical approaches limit synthesis, while mixed-methods studies often lack proper qualitative-quantitative integration, reducing explanatory value.

### 11.5 Measurement and Conceptual Inconsistencies

The field lacks standardized definitions for micro-identities. Constructs like avatars, online personas, and digital selves are often conflated, limiting study comparability. Few instruments measure identity flexibility or regulatory functions, while limited theory-driven measurement restricts knowledge building.

### 11.6 Ethical, Cultural, and Algorithmic Blind Spots

Studies underrepresent diverse populations and rarely examine how algorithms, surveillance, or platform governance shape identity. Data privacy, trace permanence, and adolescent consent remain inconsistently addressed, limiting ecological validity and policy relevance.

### 11.7 Implications for Review Methodology

Given the heterogeneity of designs, constructs, and theoretical frameworks, systematic meta-analysis is often infeasible. A narrative or scoping review is therefore well suited to map conceptual trends, methodological patterns, and knowledge gaps, integrate interdisciplinary evidence, and propose unifying frameworks to guide future empirical work.

## 12. Clinical, Educational and Ethical Implications

Understanding adolescents' micro-identity formation in digital environments has important implications for clinical practice, educational interventions, and ethical governance. As digital self-representation became embedded in everyday development, stakeholders were required to recognise both its adaptive potential and associated risks.

### 12.1 Clinical Implications

Clinicians treating adolescents face digital identity issues affecting self-esteem. Micro-identities show adolescents' self-concepts and social experiences. Online personas help integrate self-experiences (McAdams, 2001) [17]. Digital identities aid coping with marginalization but risk identity diffusion (Erikson, 1968; Nesi and Prinstein 2015) [7, 18].

Clinicians should evaluate micro-identities while supporting development.

### 12.2 Educational Implications

Educational environments foster digital identity development through literacy programs teaching identity exploration and ethical self-presentation. Educators use platforms to develop creative expression while supporting adolescents' interpretation of metrics and online norms, reducing validation dependence (Boyd, 2014; Cotter, 2019) [4].

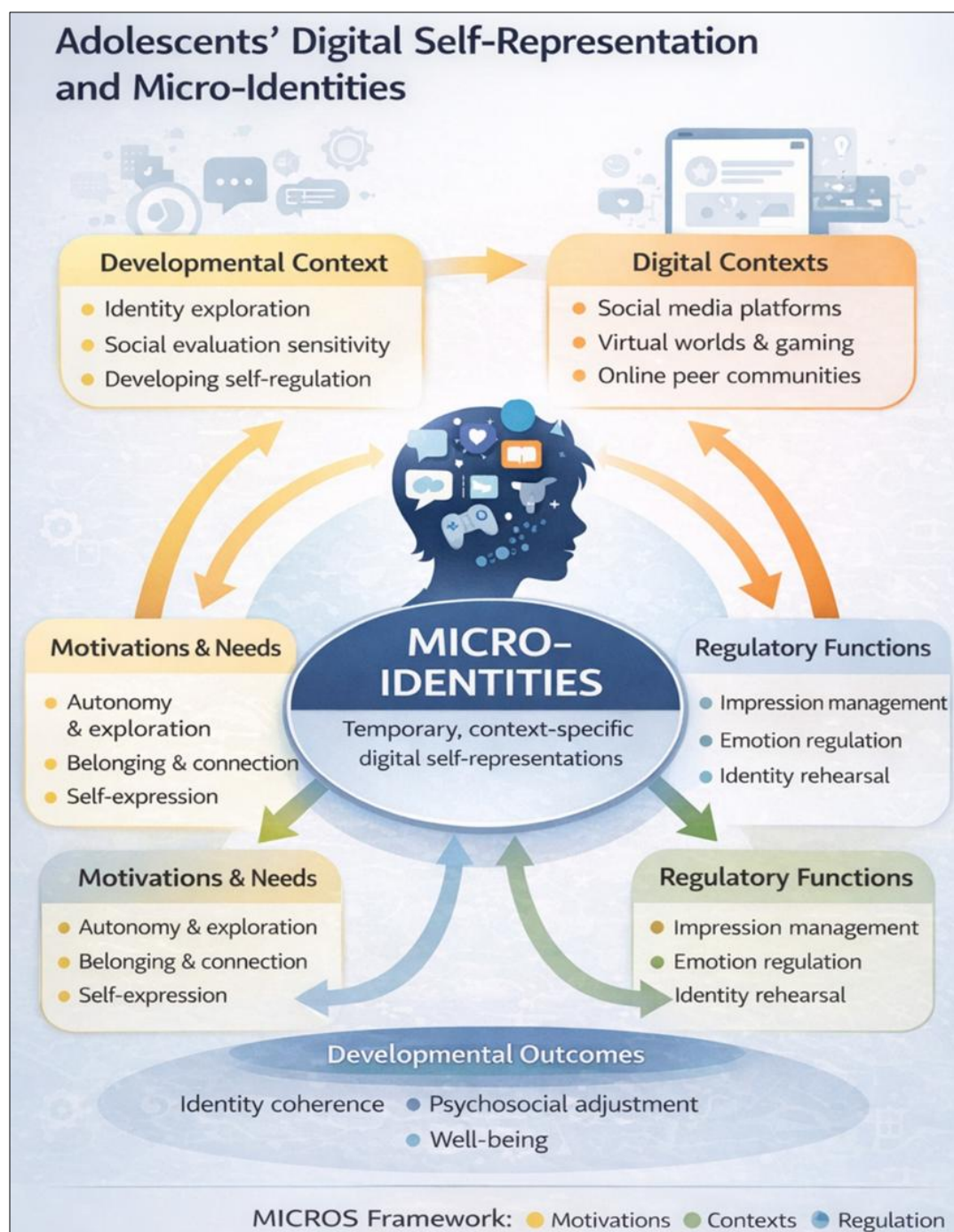
### 12.3 Ethical and Policy Implications

Ethical concerns exist regarding data persistence and

algorithmic amplification of identity performance. Digital traces limit adolescents' identity experimentation and privacy. Platform governance must prioritize youth-centered design with privacy controls. Policymakers must balance innovation with protection to prevent exploitation.

### 13. Integrative Perspective

Stakeholders must foster environments supporting adaptive micro-identity development. Interventions should focus on reflective integration, emotional regulation, and digital agency rather than restriction. Collaboration between families, educators, clinicians, and platforms is vital for healthy identity development during digital adolescence.



**Note:** This figure was developed by the author based on a synthesis of prior literature on identity development, digital self-presentation, and adolescent psychosocial processes

**Fig 1:** The MICROS framework depicts how adolescents' digital micro-identities emerge from developmental motivations and needs, are shaped by digital contexts, and serve regulatory functions that contribute to developmental outcomes. Bidirectional arrows indicate dynamic feedback processes across identity exploration, regulation, and integration within sociotechnical environments

### 13.1 The Micros Integrative Framework

This study proposes a conceptual framework synthesizing literature on adolescents' digital micro-identities. The MICROS framework integrates developmental identity theory, self-determination theory, and digital self-presentation research to conceptualize micro-identities as temporary, context-specific digital self-representations that facilitate identity exploration and integration during adolescence (Erikson, 1968; Marcia, 1980; Goffman, 1959; Ryan and Deci 2000; McAdams, 2001) [7, 14, 9, 20, 17].

The MICROS framework conceptualises micro-identities as being embedded within four interacting systems: the motivational, contextual, relational, and experiential systems. Adolescents engage in micro-identity construction to fulfil their core developmental needs for autonomy, belonging, exploration, and self-expression (Ryan and Deci, 2000; Erikson, 1968) [20, 7].

The Contextual System influences micro-identities through platform affordances, peer ecologies, cultural norms, and algorithmic curation, which affect visibility, feedback loops, and behavioural incentives (Boyd, 2014; Cotter, 2019) [4].

Regulatory System-Micro-identities serve as mechanisms for emotional regulation, social risk management, and identity stabilisation, allowing adolescents to modulate arousal, manage impressions, and explore self-boundaries (Gross, 1998; Goffman, 1959) [10, 9].

Outcome System-Developmental outcomes manifest in areas such as identity coherence, social competence, emotional well-being, and self-regulation and are influenced by integration processes and environmental support (Marcia, 1980 [14]; McAdams, 2001) [14, 17].

Bidirectional feedback loops interconnect these systems; outcomes influence motivations and future identity strategies, while contextual changes adjust regulatory demands. This dynamic model accounts for both adaptive growth and potential vulnerabilities.

### 13.2 Implications for theory advancement

The MICROS framework enhances identity models by situating development within digital ecosystems rather than viewing online behaviour as peripheral. It combines narrative identity, self-determination, and sociotechnical theories to highlight the temporality and multiplicity of identity processes, contributing to conceptual clarity and theory building.

### 14. Future Research Directions

**To advance the field, future research should prioritise the following:-**

- Longitudinal developmental designs investigate the evolution of micro-identities throughout early, middle, and late adolescence and assess how integration influences long-term psychosocial outcomes.
- Develop validated instruments to assess identity flexibility, reversibility, regulatory function, and narrative integration. This involves integrating behavioural trace data with self-reported measures and qualitative narratives.
- Cross-platform methodologies examine how adolescents manage identities across platforms and how platform transitions influence identity development
- Algorithmic and sociotechnical analyses incorporate platform analytics, transparency research, and participatory methods to investigate how

recommendation systems influence the visibility and reinforcement of identity.

- Cultural and equity-oriented research broadens the scope of culturally diverse samples and investigates how structural inequalities influence access to environments conducive to safe identity exploration.
- Intervention and Translational Research examines educational, clinical, and platform-based interventions that facilitate reflective integration and foster healthy digital agency.

### 15. Conclusion

This narrative review synthesizes research on adolescents' digital self-representation by conceptualizing micro-identities as dynamic self-representations that contribute to exploration, regulation, and identity integration. The micro-identity perspective positions digital environments as contexts where adolescents experiment with roles, manage social demands, and reflect on emerging self-concepts. Distinguishing between avatars, online personas, digital roles, and micro-identities supports consistent operationalization across studies. The MICROS framework integrates motivational influences, sociotechnical conditions, and developmental correlates within a system-oriented structure. This model accommodates heterogeneous developmental pathways and highlights mechanisms through which digital self-representations link to outcomes. The framework emphasizes moderating roles of contextual support, reflective integration, and individual differences. Advancing this research requires longitudinal designs to capture temporal dynamics and narrative integration processes. Attention to cultural diversity and algorithmic mediation is necessary for ecological validity. Micro-identities provide a framework for organizing literature on adolescent digital self-representation. Further research must determine boundary conditions and practical implications. A developmentally informed agenda can inform educational, clinical, and policy discussions on adolescents' digital interactions.

### 16. Declarations

#### Data availability statement

- All data analysed in this study are presented within the article and its references.

### 17. Author contribution

Anupama Nohtha conceptualised the study, conducted the literature review, developed the theoretical framework, and authored the original draft of the manuscript.

### 18. Conflict of Interest Statement

The author states that this research was conducted without any commercial or financial relationships that could be interpreted as potential conflicts of interest.

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