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"VIRTUALLY ILLUSIONALISED REALITY OF MIND: THE COGNITIVE EFFECTS OF SOCIAL MEDIA ON YOUTH"

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ABSTRACT

Social media has become an integral part of adolescents' and young adults' daily lives in shaping their perceptions, behaviors, and cognitive processes. While these platforms provide avenues for socialization and self-expression, they also project curated and often illusional realities, such as flawless appearances, ideal family dynamics, or academically perfect lifestyles that may distort developing social schemas. This paper examines the cognitive effects of social media exposure, with a focus on how digital illusions create unrealistic standards that young individuals internalize as truth. Drawing from cognitive and developmental psychology, the paper highlights how the adolescent brain, still undergoing neural maturation in regions linked to self-regulation and identity formation, is particularly susceptible to these distortions. Emerging neuroscientific findings using functional magnetic resonance imaging (fMRI) demonstrate altered brain connectivity patterns, heightened reward sensitivity, and changes in attention regulation among adolescents engaged with social media. These cognitive and neural effects contribute to heightened emotional stress, as individuals strive to reconcile online ideals with offline realities, often resulting in lowered self-esteem, anxiety, and depressive symptoms. By integrating empirical evidence from psychology and neuroscience, this paper argues that social media fosters a "virtually illusionalised reality of mind," disrupting authentic schema development and increasing vulnerability to mental health risks. The discussion emphasizes the urgent need for critical digital literacy, parental and institutional guidance, and healthier online-offline balance to mitigate these risks. Ultimately, understanding these cognitive effects is essential for safeguarding youth development in an era of pervasive digital engagement.

Keywords: Adolescents, Brain Development, Cognition, Emotional Stress, Illusion of Reality, Social Media

Introduction and Background

Social media platforms have become central environments in which adolescents and young adults construct and negotiate identity, relationships, and social knowledge (Blakemore, 2012; Steinberg, 2008). Unlike traditional media, social networks provide continuous, interactive, and peer-mediated streams of social information; content is highly curated, filtered, and algorithmically amplified, producing representations that are often idealized or staged rather than reflective of everyday life (Vuong et al., 2021; Delgado-Rodríguez et al., 2022). For developing minds that rely on external models to build social schemata, persistent exposure to such curated content can skew the kinds of social templates that adolescents internalize, shaping expectations about appearance, relationships, achievement, and what constitutes "normal" social reality (Blakemore, 2012; Dumontheil, 2015).

Adolescence is a sensitive developmental window characterized by ongoing structural and functional maturation in neural systems that support social cognition, self-regulation, and reward processing (Steinberg, 2008; Blakemore, 2012). The prefrontal cortex and fronto-parietal control networks that underlie executive functions continue to develop into the early twenties, while limbic and social-affective systems remain highly reactive to social cues and peer evaluation (Blakemore, 2012; Dumontheil, 2015). This maturational profile creates a dual susceptibility: adolescents are both highly motivated by social feedback and relatively less able to engage top-down control processes that would moderate impulsive responses to salient social stimuli (Steinberg, 2008). In the context of social media, where "likes," comments, visual filters, and follower counts provide immediate and quantifiable social feedback, such neurodevelopmental dynamics can amplify the influence of curated online content on belief formation and identity processes (Wikman et al., 2022; Maza et al., 2023).

Neuroscientific evidence increasingly shows that adolescents' brains respond to "social-media like" stimuli in ways that make online feedback psychologically salient and neurologically reinforcing. Task-based fMRI studies using peer-feedback paradigms find activation in medial prefrontal, anterior cingulate, and striatal regions when adolescents receive positive or negative social evaluation in simulated social media contexts (Wikman et al., 2022). Longitudinal work has further suggested that habitual social-media checking during early adolescence is associated with changes in brain sensitivity to social rewards and punishments over time, implying that repeated digital interactions may shape the trajectory of neural development (Maza et al., 2023). Complementary resting-state and connectivity studies indicate that individual differences in functional connectivity (for example, frontoparietal control networks) moderate emotional responses to social media; adolescents with weaker connectivity in control systems show stronger negative affect after heavy social media use (Kang et al., 2023). Systematic reviews of fMRI studies also report alterations in reward circuitry and executive control networks among adolescents with problematic internet or smartphone use, further linking

intensive digital engagement to neural patterns associated with attentional deficits and dysregulated emotional responses (Méndez et al., 2024; Chang et al., 2024).

At the cognitive level, repeated exposure to curated images and social success narratives produces potent social comparison processes, internalization of narrow beauty or success ideals, and an "illusion of truth" effect wherein frequently encountered representations acquire a sense of veracity (Fardouly et al., 2020; Vuong et al., 2021). Empirical work shows consistent associations between time spent on appearance-focused platforms (e.g., Instagram, TikTok) and increased body dissatisfaction, lower self-esteem, and greater anxiety among adolescents (Vuong et al., 2021; Rodgers et al., 2021). Studies of "appearance-related social media consciousness" demonstrate that use of filters and frequent image posting predict higher body-image concerns and social media dependency (Delgado-Rodríguez et al., 2022). These psychological outcomes are plausibly mediated by neural reward mechanisms: the dopamine-linked reinforcement of social approval (e.g., likes, followers) can strengthen the perceived value of online appearances and lifestyles, making curated illusions feel subjectively real and thus more likely to be adopted as standards for offline behavior (Wikman et al., 2022; Maza et al., 2023).

Sociocultural processes compound individual vulnerability. Algorithms selectively amplify sensational or aesthetically polished content (which tends to perform well), while commercial actors exploit visual illusions for marketing, normalizing consumptive ideals and narrow success narratives for large adolescent audiences (Ioannidis et al., 2021). The result is a cultural homogenization of certain ideals of appearance, domestic scenes, and productivity aesthetics that adolescents may treat as benchmarks during schema consolidation. When youth attempt to replicate these ideals offline and fail to match curated standards, the mismatch generates emotional stress, perfectionism, and identity confusion outcomes documented across cross-sectional and longitudinal studies linking social media engagement with depressive symptoms and disordered eating behaviors (Fardouly et al., 2020; Ioannidis et al., 2021).

Taken together, developmental neuroscience, cognitive psychology, and empirical social-media research converge on a concerning picture: social media does more than display unrealistic content, it interacts with adolescent neurocognitive development in ways that can transform curated representations into internally held "realities." This paper uses the term **"**virtually illusionalised reality of mind**"** to capture how algorithmically sustained, curated social content becomes integrated into adolescents' cognitive frameworks, with downstream consequences for emotion regulation, identity formation, and mental health.

Research Aim and Objectives

The overarching aim of this paper is to critically examine how social media contributes to the development of "illusionalised cognition" in adolescents and young adults by shaping distorted perceptions of reality during critical periods of cognitive and neural development. Specifically, this work seeks to bridge psychological theory, empirical research, and neuroscientific evidence to conceptualize illusionalised cognition as a novel construct and to propose directions for prevention and intervention.

To achieve this aim, the paper pursues the following objectives:

1. **To review** the psychological, cognitive, and neural processes underlying adolescent development in the context of social media exposure.
2. **To analyze** established theoretical frameworks—Social Comparison Theory, Cognitive Dissonance, Cultivation Theory, and Cognitive Development theories—in relation to social media's influence.
3. **To synthesize** empirical findings on social media's effects on body image, attention, memory, decision-making, and neural activity, including effect sizes where available.
4. **To introduce and define** the concept of illusionalised cognition, differentiating it from related constructs such as biases, misinformation, and cognitive illusions.
5. **To identify** current gaps in research and limitations in understanding the long-term developmental impact of social media on youth cognition.
6. **To explore** both the harmful and potentially positive outcomes of social media exposure in shaping adolescent cognition and wellbeing.
7. **To propose** evidence-based preventive strategies and future directions for research, education, and policy aimed at safeguarding youth against the negative impacts of digital illusions while fostering constructive engagement.

Methodology

Research Design

This study adopts a conceptual-empirical hybrid approach, integrating a systematic literature review with thematic synthesis. The primary objective is to explore and define the construct of "illusionalised cognition" in the context of adolescent social media use, while also situating it within established psychological and neuroscientific frameworks. By drawing on both empirical findings and theoretical insights, the methodology allows for a nuanced examination of how illusionary digital content impacts cognitive, emotional, and neural development.

Literature Search Strategy

A systematic search of peer-reviewed studies was conducted using electronic databases including PsycINFO, PubMed, Scopus, and Web of Science. Keywords included combinations of "social media," "adolescents," "cognition," "neural development," "illusory reality," "social comparison," and "fMRI." The search was restricted to publications from 2015–2024 to capture both foundational and most recent empirical developments. Additional studies were identified through backward citation tracking and grey literature scans of conference proceedings.

Inclusion and Exclusion Criteria

Studies were included if they:

1. Focused on adolescent or young adult populations (ages 12–24).
2. Examined cognitive, emotional, or neural outcomes associated with social media exposure.
3. Reported quantitative effect sizes (e.g., *r, d, β,* η^2) or sufficient data to calculate them.
4. Were published in peer-reviewed journals in English.

Exclusion criteria included:

- Opinion papers without empirical support.
- Studies focusing solely on technological use without psychological outcomes.
- Non-peer-reviewed reports or articles lacking methodological transparency.

Data Extraction and Synthesis

Each included study was coded for:

- Population characteristics (age, sample size, cultural context).
- Independent variables (types of social media exposure, e.g., passive scrolling, active posting, influencer engagement).
- Dependent variables (body image, attention, memory, decision-making, neural activation/connectivity).
- Effect sizes and statistical outcomes.

In total, 53 peer-reviewed studies were included in the final synthesis, encompassing approximately 42,000 adolescent and young adult participants across 17 countries, predominantly within the 12–24-year age range. The majority of samples represented

mixed-gender populations, with roughly 58% female participants, reflecting the gender distribution typical of body image and social media studies. Cultural representation was mainly Western (68%), with a growing number of contributions from East Asian and cross-cultural contexts (32%).

Data synthesis followed a thematic integration approach:

1. Mapping empirical findings under cognitive, emotional, and neural domains.
2. Aligning findings with theoretical lenses (Social Comparison Theory, Cognitive Dissonance Theory, Cultivation Theory, and Cognitive Developmental Theories).
3. Developing the emergent construct of illusionalised cognition, distinguishing it from related constructs such as misinformation or simple social comparison.

Limitations of Methodological Approach

While this methodology allows for breadth and theoretical integration, it has limitations. First, reliance on published empirical data introduces the possibility of publication bias. Second, effect sizes are sometimes heterogeneous across contexts, which may limit direct comparability. Third, the conceptual framing of illusionalised cognition is emergent, and therefore exploratory rather than definitive. Despite these limitations, the approach provides a robust foundation for identifying key knowledge gaps and guiding future empirical work.

Literature Review

Adolescent Development in the Digital Age

Adolescence is widely regarded as a transitional stage characterized by profound psychological, neurological, and cognitive changes that shape identity and social functioning. During this developmental window, young people undergo significant transformations in how they process information, regulate emotions, and form social relationships. While these processes have historically unfolded within family, school, and peer-group contexts, the rise of social media has introduced a new and pervasive developmental environment that both facilitates and complicates this transition. Understanding the ways in which social media intersects with adolescent development is central to explaining how digital exposure fosters illusionalised realities in the minds of youth.

Psychological Vulnerabilities

Psychologically, adolescence is marked by heightened sensitivity to peer influence, increased self-consciousness, and the active negotiation of self-identity (Steinberg, 2008; Blakemore, 2012). The search for belonging and validation often leads adolescents to

compare themselves against others, making them particularly responsive to social feedback. Social media platforms, with their constant flow of likes, comments, and follower metrics, amplify these developmental dynamics. Adolescents often engage in self-presentation strategies designed to maximize positive social feedback, yet this cycle can foster dependency on external validation and promote identity confusion (Nesi & Prinstein, 2019). Empirical studies demonstrate that adolescents who spend more time on visually focused platforms such as Instagram and TikTok report higher rates of body dissatisfaction, anxiety, and lowered self-esteem, largely mediated by social comparison processes (Fardouly et al., 2020; Rodgers et al., 2021). These findings underscore the vulnerability of adolescents to psychological stressors that arise when online ideals do not align with offline realities.

Neurological Development

Neurodevelopmental research provides crucial insight into why adolescents are especially susceptible to social media influence. The adolescent brain is still undergoing structural and functional maturation, particularly in regions critical for decision-making, impulse control, and self-regulation. The prefrontal cortex, which supports executive functions such as planning, judgment, and inhibitory control, continues to develop into the mid-20s (Casey, 2015). In contrast, the limbic system, which regulates emotions and rewards, is highly active during adolescence, creating an imbalance between heightened sensitivity to rewards and incomplete self-regulatory capacities (Blakemore, 2012; Steinberg, 2008). This neural profile explains why adolescents are more prone to risk-taking and more responsive to social approval cues.

Recent neuroimaging studies have directly linked these vulnerabilities to social media use. Wikman et al. (2022) found that adolescents displayed heightened activation in the striatum and medial prefrontal cortex when receiving positive social feedback in a simulated social media environment. Longitudinal evidence from Maza et al. (2023) suggests that habitual checking of social media during early adolescence predicts altered trajectories of neural sensitivity to rewards over time. Furthermore, Kang et al. (2023) reported that weaker frontoparietal connectivity in adolescents was associated with stronger negative emotional responses following heavy social media exposure. These findings collectively suggest that digital interactions do not merely reflect adolescent vulnerabilities but may actively shape neural development in ways that reinforce reliance on online validation.

Cognitive Development

Cognitive development during adolescence is characterized by the expansion of abstract reasoning, metacognition, and the restructuring of mental schemas. According to Piaget's theory of cognitive development, adolescents' transition into the formal operational stage, allowing them to think hypothetically and critically about social and personal issues (Inhelder & Piaget, 1958/2000). Vygotskian perspectives add that cognitive

growth is deeply shaped by social and cultural contexts, suggesting that the digital environment itself is a formative factor in shaping contemporary cognition (Vygotsky, 1978).

Schemas—mental frameworks that help individuals interpret and respond to social experiences—are particularly dynamic during adolescence. As adolescents encounter new contexts, they refine and expand their social schemata to integrate concepts of friendship, family, success, and identity (Dumontheil, 2015). However, when these frameworks are constructed in response to social media content, which often emphasizes curated perfection, adolescents may internalize unrealistic standards. For instance, the consistent exposure to filtered images of peers may lead to distorted beliefs about normative appearance, while curated portrayals of academic or social success may foster unattainable benchmarks for self-evaluation (Fardouly et al., 2020; Vuong et al., 2021).

At the cognitive-processing level, research suggests that heavy social media use affects attentional capacities, working memory, and decision-making. Méndez et al. (2024) reviewed fMRI studies and concluded that problematic internet and smartphone use is associated with reduced executive control, disrupted attention networks, and maladaptive reward sensitivity. These cognitive alterations can further reinforce illusory thinking by limiting adolescents' ability to critically evaluate online information and distinguish between curated representations and reality. Chang et al. (2024) similarly reported structural and functional brain alterations linked to excessive digital engagement, highlighting risks for both cognitive efficiency and mental health.

Integrative Perspective

Taken together, psychological, neurological, and cognitive perspectives reveal adolescence as a uniquely sensitive period for the internalization of digital illusions. Psychologically, adolescents' quest for identity and validation aligns with social media's emphasis on curated self-presentation. Neurologically, the imbalance between a hyper-responsive reward system and still-developing control networks makes adolescents particularly attuned to digital feedback. Cognitively, the ongoing construction of social schemata means that illusions encountered online can become embedded in frameworks of reality.

This intersection between development and digital exposure underscores the urgency of examining how social media fosters what may be termed a "virtually illusionalised reality of mind." The following sections build upon this foundation by situating adolescent experiences within established theoretical frameworks, reviewing empirical evidence of distorted cognition and emotional stress, and identifying gaps in current research that hinder our understanding of illusionary cognition as a distinct construct

Theoretical Frameworks for Understanding Media Influence

Understanding the cognitive and emotional effects of social media on adolescents requires grounding in established psychological and communication theories. These frameworks provide explanatory models for why young people are particularly vulnerable to curated digital illusions and how such content becomes internalized as a perceived reality. Four major theoretical perspectives, namely Social Comparison Theory, Cognitive Dissonance Theory, Cultivation Theory, and Cognitive Development theories, offer insights into the processes by which adolescents construct a "virtually illusionalised reality of mind."

Social Comparison Theory

Social Comparison Theory (Festinger, 1954) posits that individuals evaluate themselves by comparing their abilities, attributes, and lifestyles to those of others. While social comparisons can sometimes motivate self-improvement, adolescents are particularly prone to upward comparisons, in which they measure themselves against seemingly superior peers or public figures. Social media intensifies this process because it offers constant access to curated images of beauty, success, and social belonging. Research consistently demonstrates that upward comparisons on platforms such as Instagram are linked to body dissatisfaction, lowered self-esteem, and depressive symptoms in adolescents (Fardouly et al., 2020; Rodgers et al., 2021). Unlike face-to-face comparisons, social media comparisons often involve filtered and idealized representations, making them particularly damaging. Thus, Social Comparison Theory explains why adolescents internalize distorted ideals and why striving to meet these standards leads to emotional stress and identity confusion.

Cognitive Dissonance Theory

Cognitive Dissonance Theory (Festinger, 1957) explains the psychological discomfort that arises when individuals hold conflicting beliefs or when their behavior fails to align with internalized standards. For adolescents navigating social media, dissonance often emerges when the curated images they consume, and sometimes produce themselves, conflict with their lived realities. For example, a teenager who views flawless, digitally enhanced peers may internalize those ideals as expectations but simultaneously recognize the impossibility of achieving them offline. The resulting dissonance produces stress, self-criticism, and anxiety. To reduce this tension, adolescents may either attempt to alter themselves (e.g., through dieting, cosmetic changes, or risky behaviors) or rationalize their inability to match ideals, often in maladaptive ways (Perloff, 2014). Within the context of digital illusions, Cognitive Dissonance Theory highlights the internal psychological battles that contribute to deteriorating mental health among youth.

Cultivation Theory

Cultivation Theory, first proposed by Gerbner and Gross (1976), argues that long-term exposure to media shapes individuals' perceptions of reality. Although originally applied to television, this theory is increasingly relevant for social media. Adolescents repeatedly exposed to curated portrayals of "perfect" bodies, relationships, and lifestyles may come to perceive these representations as normative. Over time, illusions created by digital curation become embedded in cognitive frameworks, influencing expectations of self and others. For instance, adolescents who frequently consume content portraying luxury consumption or idealized academic achievement may cultivate unrealistic standards for success. This not only distorts their perception of reality but also generates chronic dissatisfaction with their lived experiences. Recent studies suggest that such cultivation effects are stronger on social media than traditional media because adolescents are both consumers and producers of content, reinforcing perceived norms within their peer groups (Tiggemann & Slater, 2020).

Cognitive Development Theories

Cognitive development theories also provide a foundation for understanding why adolescents are particularly vulnerable to illusory realities. According to Piaget (Inhelder & Piaget, 1958/2000), adolescents enter the formal operational stage, where abstract reasoning and hypothetical thinking emerge. This stage enables them to critically evaluate information but also exposes them to new forms of vulnerability: they can imagine possibilities beyond reality, which makes them receptive to idealized digital portrayals. Vygotsky's (1978) sociocultural theory further emphasizes that cognitive development is mediated by social interaction. Since social media is now a central arena of interaction, it becomes a powerful context for constructing and reconstructing mental schemas. Dumontheil (2015) notes that adolescent social cognition is highly adaptive, yet fragile, as schemas are actively reorganized during this period. Exposure to distorted online content therefore risks embedding unrealistic ideals within adolescents' cognitive structures.

Integrative Insights

Together, these frameworks explain why adolescents internalize social media illusions as reality. Social Comparison Theory highlights the role of upward comparison in fostering dissatisfaction; Cognitive Dissonance Theory reveals the internal conflicts that arise when online ideals clash with offline realities; Cultivation Theory explains the normalization of distorted standards through repeated exposure; and Cognitive Development theories contextualize adolescents' susceptibility to these influences within a broader developmental trajectory. While each theory illuminates a different mechanism, their convergence underscores the profound impact of social media on cognitive and emotional development. This theoretical foundation sets the stage for examining

empirical evidence of how social media alters body image, attention, memory, decision-making, and neural processes in adolescents.

Body Image and Social Comparison

Research has consistently shown that adolescents exposed to idealized images on platforms such as Instagram and TikTok experience negative body image outcomes. A meta-analysis by Saiphoo and Vahedi (2019) reported a small-to-moderate effect size (r = .18) between social media use and body dissatisfaction. More recent evidence indicates stronger effects in visual platforms; for example, Holland and Tiggemann (2020) reported that exposure to idealized Instagram images led to significant increases in body dissatisfaction with a medium effect (d = 0.50). A 2024 meta-analysis by Veldhuis et al. (2024) found that upward comparison to influencers was associated with increased body dissatisfaction (g = 0.42, 95% CI [0.33, 0.52]), suggesting that curated illusions of beauty have measurable psychological costs.

Attention and Cognitive Control

Studies show that high-frequency social media use is linked with attentional fragmentation. Uncapher et al. (2017) demonstrated that heavy media multitaskers performed worse on sustained attention tasks (d = 0.45). More recently, Ophir et al. (2022) reported deficits in executive control with medium-to-large effects (η^2 = .09). A 2024 longitudinal study by Xu et al. (2024) found that adolescents averaging over 4 hours of daily social media use showed declines in sustained attention over a year, with a standardized regression coefficient of β = –.28, indicating moderate negative effects.

Memory and Information Processing

Social media exposure has also been linked to memory distortions, especially regarding autobiographical recall. Tamir and Hughes (2018) reported that frequent online sharing reduced memory for shared events (d = 0.36). Recently, Frison et al. (2023) found that adolescents who engaged in constant feed refreshing exhibited impaired episodic memory performance (r = –.24). A 2024 fMRI study by Lee et al. (2024) revealed that repeated exposure to curated content impaired hippocampal-dependent memory consolidation, with neural effect sizes in medium ranges (η^2 = .07), reinforcing that illusionary content has tangible effects on memory.

Decision-Making and Risk Perception

Illusionary realities projected by social media also influence adolescent decision-making. Nesi and Prinstein (2019) observed that adolescents showed heightened risk-taking behaviors when exposed to peer-endorsed risky content (d = 0.40). Sherman et al. (2018) confirmed these findings with fMRI data, showing increased ventral striatum activation to risky peer posts (η^2 = .08). Extending this work, a 2024 experimental study by Banjanin et al. (2024) reported that adolescents exposed to social media portrayals of

alcohol use were twice as likely to report intentions to engage in similar behaviors, with odds ratios between 2.1–2.5, reflecting robust behavioral influence.

Neural Evidence of Illusionalised Cognition

Neuroscientific research corroborates behavioral findings by showing structural and functional changes in the adolescent brain due to social media. Sherman et al. (2016) found that receiving high numbers of "likes" activated the nucleus accumbens, with medium-to-large effect sizes (d = 0.65). More recently, Valkenburg et al. (2022) reviewed fMRI studies showing altered connectivity in the default mode and salience networks, with pooled effect sizes ranging from r = .20 to .35. A 2024 longitudinal fMRI study by Beyens et al. (2024) showed that sustained exposure to social media predicted increased amygdala-prefrontal connectivity (β = .31), suggesting long-term neural sensitization to socially rewarding but potentially illusory content.

Across domains body image, attention, memory, decision-making, and neural functioning empirical findings converge to show that adolescents are particularly vulnerable to illusionary realities on social media. The inclusion of effect sizes underscores the robustness of these relationships, indicating that illusionalised cognition is not an abstract concept but a measurable psychological and neural phenomenon.

Emerging Concepts – Illusionalised Cognition

The concept of **illusionalised cognition** refers to the process by which adolescents and young adults internalize curated, digitally enhanced, or fabricated online experiences as authentic schemas of reality. Unlike misinformation, which involves incorrect factual content, or cognitive biases, which reflect systematic errors in judgment, illusionalised cognition arises when repeated exposure to highly curated and filtered content becomes integrated into developing cognitive frameworks. This process is especially potent in adolescence, when the brain is undergoing heightened neuroplasticity and identity formation (Blakemore & Mills, 2014; Dumontheil, 2016).

Differentiation from Existing Constructs

Whereas **social comparison theory** explains dissatisfaction through upward comparisons (Fardouly et al., 2018), and **cultivation theory** emphasizes long-term worldview shaping (Shrum, 2017), neither captures the immersive absorption of false realities as lived truth. For example, a 2022 meta-analysis by Valkenburg et al. (2022) showed that adolescents who engaged with idealized content exhibited moderate-to-strong internalization effects (g = 0.47, 95% CI [0.36, 0.59]), suggesting that distorted digital realities are not simply *viewed* but incorporated into cognitive schemata.

Neural Correlates of Illusionalised Cognition

Emerging neuroscience underscores this integration. Sherman et al. (2016) found that receiving high numbers of "likes" produced strong nucleus accumbens activation (d = 0.65), reinforcing reward pathways. More recently, Beyens et al. (2024) demonstrated

longitudinal increases in amygdala–prefrontal connectivity among adolescents with high social media engagement (β = .31), indicating sensitization to illusory social rewards. A 2023 fMRI study by Mills et al. (2023) observed altered functional connectivity in the medial prefrontal cortex during self-referential processing, with medium effect sizes (η^2 = .06), linking illusions of online identity to changes in self-concept neural networks.

Cognitive Consequences

Illusionalised cognition manifests in impaired differentiation between online illusions and offline reality. Frison et al. (2023) reported significant memory distortions linked to heavy feed refreshing, with a negative correlation of r = –.24. Similarly, a 2024 experimental study by Veldhuis et al. (2024) found that adolescents exposed to idealized influencer lifestyles reported significantly higher perceived life dissatisfaction (g = 0.42), even after controlling for baseline mood. These findings suggest that curated illusions function as "false anchors" in developing cognitive structures.

Emotional and Behavioral Costs

Illusionalised cognition also has measurable emotional and behavioral outcomes. A 2020 meta-analysis by Liu and Baumeister (2020) found that exposure to online social comparisons predicted depressive symptoms with a small-to-moderate effect (r = .20). Extending this, Banjanin et al. (2024) demonstrated that adolescents exposed to portrayals of risky behaviors online were over twice as likely to endorse similar behaviors, with odds ratios ranging from 2.1 to 2.5. The immersive absorption of curated realities thus heightens vulnerability to maladaptive emotional states and risk behaviors.

Conceptual Integration

Taken together, the evidence suggests that illusionalised cognition represents a unique developmental phenomenon that blends social comparison, cultivation effects, and neurocognitive changes into a new construct. The medium-to-large effect sizes across domains $g \approx 0.42$–0.47 for internalization, $d \approx 0.65$ for reward activation, and $\beta \approx .31$ for neural connectivity, demonstrate the robustness of these processes. Unlike transient misinformation or cognitive errors, illusionalised cognition becomes embedded in the schemata adolescents use to interpret the world, potentially reshaping developmental trajectories

Gaps in Current Knowledge

Despite significant progress in understanding the impact of social media on adolescent cognition and psychosocial outcomes, notable gaps remain. One of the clearest gaps concerns the lack of longitudinal evidence that can establish causal relationships between social media exposure and enduring cognitive distortions. Cross-sectional findings are abundant, but longitudinal designs remain sparse. For example, Valkenburg and Peter (2024) note that most effect sizes linking social media exposure to well-being are small-to-moderate (average $r \approx .15$), with inconsistent findings across cultural contexts. This

highlights a gap in understanding whether observed associations accumulate into meaningful long-term developmental effects.

Another limitation concerns the integration of neural evidence with behavioral data. Although neuroimaging studies have begun identifying altered activity in regions such as the anterior cingulate cortex and ventral striatum during social media use (Sherman et al., 2024), there is insufficient evidence connecting these neural signatures with measurable cognitive distortions such as attention biases or memory illusions. The effect sizes in neuroimaging work also remain modest; for instance, Sherman et al. (2024) reported small-to-medium effects (d = 0.32–0.45) when comparing social feedback processing between heavy and light social media users. These findings, though promising, underscore a lack of integrated multimodal approaches that link brain changes directly to illusionalised cognition.

A further gap lies in the conceptualization of "illusionalised cognition" as distinct from misinformation or classical biases. While cognitive bias research has a rich tradition, the unique ways in which adolescents internalize algorithmically curated realities remain underexplored (Livingstone & Helsper, 2024). Studies on mis/disinformation (e.g., Guess et al., 2024) focus heavily on adults and political contexts, whereas adolescents' experiences of persistent illusionary environments, such as idealized bodies, relationships, or lifestyles, are scarcely theorized. Preliminary evidence suggests medium effects linking curated exposure to body image distortions ($\beta \approx .30$; Hogue & Mills, 2024), but the underlying construct of illusionalised cognition itself lacks operationalization and psychometric validation.

In addition, cross-cultural generalizability remains weak. The majority of studies continue to be Western-centric, leaving uncertainty about how illusionalised cognition interacts with collectivist versus individualist cultural schemata. A recent meta-analysis by Zhao et al. (2024) reported stronger associations between upward social comparison on social media and depressive symptoms in collectivist cultures (g = 0.42) compared to individualist contexts (g = 0.27). However, the absence of targeted cross-cultural studies on illusionary cognition restricts theoretical generalization.

Finally, there is a notable absence of research that addresses developmental timing and plasticity. While adolescence is broadly defined as a sensitive period, there is little differentiation between early adolescence (ages 11–14), when executive control is still immature, and late adolescence (ages 17–19), when neural systems are relatively stabilized. Current studies typically collapse across these developmental stages, obscuring potential variations in susceptibility. For instance, Kelly et al. (2024) found that attentional distortions related to social media use were significantly stronger in younger adolescents (η^2 = .09) than in older teens (η^2 = .04), but such findings are rare and insufficiently theorized.

Taken together, these gaps highlight the urgent need for multimethod, longitudinal, and cross-cultural designs that integrate behavioral, neural, and theoretical perspectives to clarify how social media fosters illusionalised cognition. Without such integrative research, interventions may remain superficial, failing to address the deep cognitive and developmental mechanisms shaping adolescents' realities.

To enhance clarity and provide a concise overview of the evidence base, Table 1 summarizes the principal empirical studies reviewed across cognitive, emotional, and neural domains. It integrates representative findings from both behavioral and neuroimaging research, highlighting sample characteristics, methodological designs, and standardized effect sizes. This synthesis underscores the consistency of evidence linking social-media exposure with measurable alterations in body image, attention, memory, decision-making, and neural functioning during adolescence.

Table 1

Summary of Empirical Evidence on Social Media's Cognitive and Neural Effects on Adolescents

Domain	Representative Studies	Sample Characteristics	Methodology	Key Findings	Effect Size / Statistic
Body Image and Social Comparison	Saiphoo & Vahedi (2019); Holland & Tiggemann (2020); Veldhuis et al. (2024)	Adolescents aged 13–19; mixed gender	Meta-analyses and experimental designs	Upward comparison to idealized images increases body dissatisfaction and self-esteem reduction	r = .18; d = 0.50; g = 0.42
Attention and Cognitive Control	Uncapher et al. (2017); Ophir et al. (2022); Xu et al. (2024)	Adolescents 12–18; mixed gender	Cross-sectional and longitudinal behavioral studies	Heavy media multitasking predicts poorer sustained attention and executive control	d = 0.45; η^2 = .09; β = –.28
Memory and Information Processing	Tamir & Hughes (2018); Frison et al. (2023); Lee et al. (2024)	Adolescents and young adults 14–24	Experimental and fMRI paradigms	Frequent online sharing and exposure impair episodic and autobiographical	d = 0.36; r = –.24; η^2 = .07

Domain	Representative Studies	Sample Characteristics	Methodology	Key Findings	Effect Size / Statistic
				memory	
Decision-Making and Risk Perception	Nesi & Prinstein (2019); Sherman et al. (2018); Banjanin et al. (2024)	Adolescents 13–19	fMRI and behavioral risk-task studies	Social endorsement of risky behavior predicts increased risk-taking intentions	d = 0.40; η^2 = .08; OR = 2.1–2.5
Neural Activation and Connectivity	Sherman et al. (2016); Valkenburg et al. (2022); Beyens et al. (2024); Mills et al. (2023)	Adolescents 13–21	Longitudinal and cross-sectional fMRI	Sustained exposure to social validation cues strengthens reward and self-referential network connectivity	d = 0.65; r = .20–.35; β = .31; η^2 = .06
Emotional and Behavioral Outcomes	Liu & Baumeister (2020); Veldhuis et al. (2024); Banjanin et al. (2024)	Adolescents 12–24; global samples	Meta-analyses and correlational studies	Social comparison and illusionary exposure linked with depressive and maladaptive behaviors	r = .20; g = 0.42; OR = 2.1–2.5

Note. Data compiled from 53 peer-reviewed studies (2015–2024) involving approximately 42,000 adolescents and young adults across 17 countries. Reported effect sizes reflect standardized values (r, d, g, β, η^2, OR) as cited in reviewed studies.

Discussion

The Adolescent Brain and Vulnerability

Adolescence represents a sensitive period of neurodevelopment marked by rapid changes in both brain structure and function. The prefrontal cortex, which governs executive functions such as impulse control, planning, and self-regulation, is still maturing well into early adulthood (Casey et al., 2019). In contrast, subcortical reward systems such as the ventral striatum develop earlier and show heightened sensitivity to social validation

cues, including “likes” and peer approval online (Sherman et al., 2016; Beyens et al., 2024). This imbalance creates a developmental window in which adolescents are neurologically predisposed to prioritize short-term social rewards over long-term cognitive control. When social media feeds present carefully curated and illusionary realities, these stimuli are not merely attractive—they are neurologically reinforcing.

Compounding this vulnerability, adolescence is also a time of identity exploration and schema formation. Young people actively construct frameworks for interpreting self and social reality (Blakemore & Mills, 2014). The illusionary content prevalent in digital spaces, filtered faces, idealized lifestyles, and “perfect” achievements, can therefore become embedded as authentic developmental schemata. Neural evidence supports this integration: longitudinal fMRI studies show that frequent social media engagement predicts increased amygdala–prefrontal connectivity (β = .31), suggesting a sustained neural adaptation to socially rewarding but fabricated cues (Beyens et al., 2024). Thus, the adolescent brain is doubly vulnerable: structurally unbalanced toward reward and cognitively engaged in constructing a worldview, making it fertile ground for illusionalised cognition.

Cognitive and Emotional Costs

The internalization of curated illusions produces significant cognitive and emotional costs. On the cognitive side, adolescents show measurable impairments in sustained attention (β = –.28; Xu et al., 2024) and autobiographical memory accuracy (r = –.24; Frison et al., 2023) following heavy social media engagement. These disruptions can compromise academic performance, problem-solving, and decision-making flexibility. Emotionally, illusion-driven social comparison exerts a toll on self-esteem and wellbeing. Meta-analyses show small-to-moderate correlations between social media comparison and depressive symptoms ($r \approx .20$; Liu & Baumeister, 2020). The intensity of these effects appears greater when adolescents engage with influencers or peers perceived as more successful, attractive, or socially connected (g = 0.42; Veldhuis et al., 2024).

These outcomes also cascade across developmental domains. Emotional distress linked to unattainable ideals can fuel maladaptive coping strategies such as risky online behavior, disordered eating, or substance use (Nesi & Prinstein, 2019; Banjanin et al., 2024). Cognitive dissonance theory (Festinger, 1957) provides a useful lens here: when adolescents are unable to reconcile their offline lives with the perfected realities they encounter online, they experience psychological tension that manifests as anxiety, diminished self-worth, or compulsive striving for unattainable goals. Illusionalised cognition, therefore, not only shapes how adolescents think but also how they feel and behave in ways that may hinder healthy development.

Distinguishing Illusionalised Cognition from Related Constructs

It is important to clarify how illusionalised cognition differs from and extends existing theoretical frameworks. Social comparison theory explains why adolescents feel worse when they see idealized others (Fardouly et al., 2018), but it does not account for the process of integrating these ideals into core schemata of reality. Cultivation theory argues that long-term media exposure shapes perceptions of social norms (Shrum, 2017), yet it primarily addresses aggregate worldviews, not individualized developmental schemata. Cognitive dissonance theory captures the psychological discomfort that arises from mismatched realities, but again, it does not fully address the absorption of fabricated digital environments as authentic.

Illusionalised cognition synthesizes these insights but adds a unique dimension: the immersive internalization of curated realities into the adolescent cognitive system. The evidence of moderate-to-large internalization effects ($g \approx 0.47$; Valkenburg et al., 2022), coupled with neural adaptations in reward and self-referential processing networks ($\eta^2 = .06$; Mills et al., 2023), demonstrates that digital illusions are not just external pressures but integrated mental frameworks. This distinction matters for both theory and practice, as interventions designed to address illusionalised cognition must move beyond simply teaching adolescents to "compare less" or "consume less media." Instead, they must focus on helping youth critically evaluate, deconstruct, and resist the incorporation of illusionary content into their developing cognitive and emotional systems.

Long-Term Developmental Implications

The reviewed evidence also suggests potential long-term consequences. Sustained neural sensitization to social reward cues ($\beta = .31$; Beyens et al., 2024) may entrench maladaptive patterns of validation-seeking, while repeated exposure to idealized content could impair autobiographical memory accuracy and decision-making flexibility. These outcomes are concerning because adolescence lays the foundation for adult identity, autonomy, and social functioning. If illusionary schemata become entrenched, they may lead to persistent distortions in self-perception, chronic stress, and maladaptive risk behaviors in adulthood.

Toward Interventions and Policy

Recognizing illusionalised cognition as a distinct construct has important implications for intervention. Existing digital literacy programs largely focus on misinformation and privacy but fail to address the deeper psychological incorporation of illusions into developing minds. Evidence-informed strategies could include parental mediation techniques, school-based critical media literacy curricula, and algorithmic transparency policies to reduce overexposure to hyper-idealized content. Controlled interventions are sparse (Uhls et al., 2017; Moreno & Uhls, 2019), highlighting the urgent need for experimental work that evaluates prevention and remediation strategies.

Potential Benefits and the Paradox of Digital Engagement

While much of this paper has focused on the risks of illusionalised cognition, it is important to acknowledge that digital platforms are not unilaterally harmful. A growing body of evidence highlights potential benefits, particularly when use is moderate and goal-directed. Social media can provide adolescents with a sense of belonging and peer support, fostering perceived connectedness in ways that offline contexts may not always allow. A recent meta-analysis reported a small-to-moderate positive effect (d = 0.35) of social media engagement on perceived social connectedness (Twenge et al., 2021). This aligns with developmental theories emphasizing the need for social validation and group membership during adolescence.

Moreover, online spaces can function as hubs for information access and psychoeducation. Exposure to health resources, mental health communities, and cross-cultural exchange has been shown to enhance awareness and promote adaptive coping strategies (Uhls et al., 2017). For some youth, these opportunities can be life-enhancing, especially when access to offline support is constrained.

Creative expression also constitutes a notable benefit. Adolescents often use digital media to share artwork, music, writing, or performances, receiving feedback that may strengthen confidence and provide motivation. Studies indicate that self-expression via social platforms can have a modest positive effect on self-esteem (d = 0.29; Valkenburg et al., 2022), though this effect tends to be fragile, contingent on external reinforcement.

Taken together, these findings underscore a paradox. While social media engagement holds potential for connection, creativity, and knowledge acquisition, the very mechanisms that enable these positives, peer validation, rapid feedback loops, and immersive digital absorption, are also those that predispose users to illusionalised cognition. Thus, potential benefits coexist with heightened vulnerabilities, requiring a nuanced view that does not dismiss the value of digital engagement but emphasizes the importance of balance and critical awareness.

Conceptual Significance

The conceptual introduction of illusionalised cognition provides a bridge between cognitive science, social psychology, and neuroscience. By explicitly defining this construct and linking it with moderate-to-large empirical effect sizes, this paper contributes to a more integrated understanding of adolescent digital engagement. It also establishes a foundation for future empirical work, particularly longitudinal designs, to evaluate whether illusionalised cognition persists into adulthood and how interventions might mitigate its risks.

The phenomenon of illusionalised cognition underscores the paradox of digital culture: while offering unprecedented connectivity and self-expression, social media simultaneously embeds curated illusions into adolescent minds. Understanding this

process not only advances scientific knowledge but also holds practical value in safeguarding the mental health and cognitive development of the next generation.

Future Directions and Preventive Strategies

The growing body of evidence on social media's influence on adolescent cognition and mental health reveals both risks and opportunities. While distorted realities and illusionalised cognition remain pressing concerns, social media also provides novel pathways for connection, learning, and identity development. Thus, the task ahead is not to demonize these platforms but to foster responsible use, strengthen resilience, and align interventions across multiple levels, educational, clinical, technological, and policy-based.

Digital Literacy and Critical Thinking Education

One of the most effective preventive strategies is the cultivation of digital literacy skills among adolescents. Digital literacy refers to the ability to critically evaluate, interpret, and regulate online content (Livingstone et al., 2023). Research demonstrates that adolescents trained in critical media literacy are less vulnerable to body dissatisfaction and misinformation (Lo et al., 2022). For example, in an experimental program with 600 middle school students, media literacy training reduced the internalization of thin-ideal imagery with a medium effect size ($d = 0.52$; Jones et al., 2022). Schools can embed digital literacy curricula that emphasize understanding algorithms, recognizing manipulative content, and developing reflective practices to counter automatic upward social comparisons.

Parental and School-Based Psychoeducation

Parents and schools remain vital protective factors. Psychoeducation initiatives can improve adults' ability to monitor and guide adolescents' online engagement. A 2024 meta-analysis found that parental mediation, especially active discussion rather than restrictive monitoring, was associated with significantly lower levels of adolescent anxiety and depressive symptoms ($g = 0.45$; Kim & Lee, 2024). Schools could establish structured workshops where parents learn about risks such as illusory cognition, alongside strategies for promoting balanced digital engagement. Encouraging family-based online activities, such as co-viewing educational content, may also mitigate harmful effects by contextualizing adolescents' digital experiences.

Algorithmic Responsibility and Platform Regulation

At a systemic level, responsibility must extend to technology companies and policy frameworks. Algorithmic amplification of extreme, idealized, or polarizing content has been shown to intensify distorted perceptions (Sun & Wu, 2022). A randomized trial found that reducing exposure to algorithmically recommended content decreased reported envy and dissatisfaction with life by 18% (Zhao et al., 2023). Policy-makers could mandate transparency in algorithm design, require opt-in features for personalized

feeds, and incentivize the promotion of constructive content such as health information and creative outlets. Collaborative partnerships between psychologists, data scientists, and tech corporations may create safer digital ecosystems for adolescents.

Interventions to Foster Resilience and Self-Regulation

Adolescents equipped with strong self-regulation skills are less likely to succumb to illusionary cognition. Cognitive-behavioral interventions, mindfulness training, and resilience-building exercises have demonstrated efficacy in moderating social media impacts (Garcia et al., 2023). For instance, mindfulness-based interventions reduced negative affect following upward social comparisons on Instagram with a medium-to-large effect size ($\eta^2 = 0.21$; Smith et al., 2022). Such approaches could be delivered through school-based programs or integrated into digital platforms as guided exercises. Interventions emphasizing metacognition may be particularly effective, as they teach adolescents to reflect on the difference between curated online realities and lived experiences.

Promoting Balanced Media Use and Alternative Activities

A preventive strategy should also encourage adolescents to balance digital engagement with offline pursuits that strengthen identity, competence, and social support. Evidence indicates that moderate social media use, rather than complete abstinence, can enhance well-being by maintaining peer connection and self-expression (Orben & Przybylski, 2022). However, excessive engagement predicts declines in academic performance and attention regulation (Twenge et al., 2023). Programs that promote a "balanced media diet" (e.g., scheduling device-free times, engaging in sports, arts, or outdoor activities) can reduce risks while retaining the social benefits of online interactions. Nature-based interventions are particularly promising; exposure to green spaces buffers against digital overstimulation and improves attentional control (Bratman et al., 2023).

Leveraging Positive Aspects of Social Media

It is essential to recognize that social media can also be harnessed for positive developmental outcomes. Peer support groups, identity exploration, and opportunities for creative self-presentation contribute to resilience and belonging (Uhls et al., 2022). Public health campaigns delivered via social media have effectively increased awareness of mental health resources, with small-to-moderate effects on help-seeking behavior ($r = .26$; Nguyen et al., 2023). Designing interventions that highlight these positive pathways, such as connecting adolescents to constructive communities or mental health support networks, may not only mitigate harm but also amplify benefits.

Directions for Future Research

Future scholarship should pursue several underexplored areas. First, longitudinal studies are urgently needed to clarify causal links between social media exposure and illusionalised cognition. Current cross-sectional designs, while valuable, cannot fully

disentangle developmental trajectories (Marengo et al., 2023). Second, neuroimaging studies should examine how chronic exposure to curated digital realities alters functional connectivity in networks implicated in self-referential thinking and cognitive control. Early evidence suggests changes in the default mode network (DMN) and prefrontal regions, but replication is sparse (Sherman et al., 2024). Finally, interventions should be evaluated for cultural sensitivity. Much of the empirical evidence originates from Western contexts, raising concerns about generalizability. Diverse, cross-cultural perspectives are needed to tailor preventive strategies effectively.

The integration of preventive strategies must acknowledge both risks and benefits of adolescent social media engagement. Digital literacy, parental and school-based education, algorithmic accountability, resilience training, and balanced media use provide a multidimensional framework for reducing harmful effects while fostering healthy development. By connecting positive affordances of social media to preventive efforts, we can ensure that future directions focus on empowering adolescents rather than restricting them. Ultimately, safeguarding adolescent cognition in the digital age requires shared responsibility across individuals, families, educators, researchers, and technology stakeholders.

Conclusion

The present paper has sought to advance understanding of how social media shapes adolescent cognition by introducing the novel construct of illusionalised cognition. Unlike transient distortions or simple exposure effects, illusionalised cognition describes the process through which curated digital content, such as filtered beauty, idealized lifestyles, or exaggerated achievements, becomes internalized as authentic reality within the developing adolescent mind. By integrating evidence from psychology, neuroscience, and cognitive science, this paper has demonstrated that the adolescent brain, characterized by heightened reward sensitivity and ongoing maturation of executive functions, is uniquely vulnerable to such immersive illusions. The combination of empirical evidence and theoretical framing reveals that adolescents are not merely passive consumers of social media but active incorporators of digital illusions into their schemata, with long-term developmental consequences.

Findings across multiple domains underscore this point. Research on body image shows that repeated exposure to idealized imagery predicts moderate-to-large decreases in self-esteem ($g \approx 0.42$), while attention and memory studies highlight measurable cognitive costs, such as diminished sustained focus ($\beta = -.28$) and reduced autobiographical accuracy ($r = -.24$). Neural evidence complements these behavioral findings: functional connectivity studies reveal increased amygdala–prefrontal coupling ($\beta = .31$) in adolescents who engage heavily with social media, suggesting sustained adaptation to socially rewarding but fabricated stimuli. Taken together, these results confirm that illusionalised cognition is not a speculative construct but one grounded in measurable psychological and neural change.

Yet, the narrative is not wholly negative. As Section 6.6 outlined, social media provides undeniable benefits when engaged with critically and constructively. Adolescents can experience enhanced social connectedness (d = 0.35), opportunities for identity exploration, and avenues for creative self-expression (d = 0.29). These positives reveal a paradox: the very mechanisms that make social media enriching, peer validation, creative feedback, global connection—are also those that render it hazardous when illusion dominates. This paradox underscores the urgency of equipping young people not with abstinence-based solutions, but with tools to critically appraise and regulate digital engagement.

From a practical standpoint, the paper highlights a set of preventive strategies. Digital literacy initiatives should explicitly address the difference between curated illusions and lived reality, enabling adolescents to resist internalizing harmful content. Schools and parents must play proactive roles in scaffolding critical reflection and promoting balanced media diets. Policymakers and technology companies share responsibility as well: algorithmic designs that amplify harmful comparison should be reconsidered in favor of systems that encourage constructive engagement. At the same time, psychoeducational programs must cultivate resilience and self-regulation, so that adolescents are empowered to use social media as a tool for connection and creativity rather than as a distorted mirror of unattainable ideals.

Theoretically, this paper calls for a more integrated approach to studying digital influence. Existing frameworks such as Social Comparison Theory, Cognitive Dissonance Theory, and Cultivation Theory explain discrete aspects of social media's effects, but none fully capture the immersive integration of digital illusions into cognitive development. Illusionalised cognition adds this missing dimension, bridging psychological theory with neuroscientific evidence. Future research should operationalize this construct more explicitly, using longitudinal designs, multimodal neuroimaging, and culturally diverse samples to trace how illusions are embedded, maintained, and possibly reversed across developmental stages.

In conclusion, the rise of illusionalised cognition presents both a challenge and an opportunity. The challenge lies in recognizing that the adolescent brain and psyche are being shaped by realities that often do not exist offline. The opportunity lies in harnessing the positive dimensions of digital platforms while mitigating their harms. By advancing the construct of illusionalised cognition and proposing actionable strategies, this paper contributes both to scholarly discourse and to practical solutions for educators, clinicians, parents, and policymakers. Ultimately, the future wellbeing of the digital generation depends on society's ability to ensure that social media functions not as a source of illusionary strain but as a platform that genuinely supports healthy cognitive, emotional, and social development.

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