

PSYCHOLOGICAL DEPENDENCY AND SOCIAL PROBLEMS CAUSED BY GADGET USE IN PRIMARY SCHOOL-AGE CHILDREN

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Abstract. *The rapid proliferation of digital gadgets — smartphones, tablets, and portable gaming devices — has fundamentally altered the developmental landscape of primary school-age children (ages 6–11). This article examines the psychological dependency and social problems that arise from excessive gadget use in this age group. Drawing on empirical research and theoretical frameworks from developmental psychology and pediatric neuroscience, the article explores how prolonged screen exposure disrupts emotional regulation, fosters behavioral addiction, impairs cognitive development, and undermines social competence. Key mechanisms discussed include dopaminergic reward pathways, attachment disruption, sleep deprivation, and the erosion of face-to-face social skills. The article also addresses risk factors, family dynamics, and school-based implications, culminating in evidence-based recommendations for parents, educators, and policymakers. The findings underscore the urgent need for a comprehensive, multi-stakeholder approach to digital literacy and screen time regulation in early childhood.*

Keywords: *gadget dependency, screen time, primary school children, psychological addiction, social development, digital behavior.*

1. Introduction

The twenty-first century has witnessed an unprecedented integration of digital technology into every sphere of human life. Among the most consequential developments is the widespread adoption of gadgets — smartphones, tablets, laptops, and gaming consoles — by children of increasingly younger ages. While technological tools offer numerous educational and recreational benefits, mounting evidence suggests that their unregulated use poses significant risks to the psychological wellbeing and social development of primary school-age children.

Children aged 6 to 11 are at a particularly sensitive stage of neurodevelopmental growth.

The prefrontal cortex, which governs impulse control, decision-making, and emotional regulation, undergoes critical maturation during these years. Concurrent social and cognitive milestones — including the development of empathy, cooperative play, moral reasoning, and academic skills — are deeply influenced by environmental inputs, including those provided by screens. When gadget use displaces essential developmental activities such as outdoor play, interpersonal interaction, and structured learning, it can create lasting psychological and social deficits.

Research by the American Academy of Pediatrics (2016) and subsequent global studies has consistently linked excessive screen time in children to a range of adverse outcomes: sleep disturbances, reduced attention span, heightened anxiety, diminished academic performance, and social withdrawal [1]. More alarming is the growing recognition of behavioral patterns that mirror clinical addiction — compulsive gadget use, withdrawal symptoms upon restriction, loss of interest in previously enjoyed activities, and deception regarding screen time (Gentile et al., 2017) [7].

This article aims to provide a thorough examination of the psychological and social consequences of gadget overuse in primary school-age children. By synthesizing current research and theoretical perspectives, it seeks to inform parents, educators, mental health professionals, and policymakers about the scope of the problem and the pathways toward effective intervention.

2. Theoretical Framework: Understanding Digital Dependency

To understand how gadget use can evolve into psychological dependency, it is essential to examine the neurological and psychological mechanisms that underlie addictive behavior. The concept of behavioral addiction — addiction to activities rather than substances — gained formal recognition with the inclusion of Internet Gaming Disorder as a condition warranting further study in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association, 2013) [2]. While gadget addiction has not yet been classified as a distinct disorder, researchers widely apply addiction frameworks to excessive screen use in children.

Central to this framework is the role of the dopaminergic reward system. Interactive digital content — particularly social media notifications, video game achievements, and autoplay video features — stimulates the release of dopamine in the nucleus accumbens, the brain's primary reward center. In children, whose reward systems are more reactive and whose inhibitory controls are less developed than those of adults, this neurochemical response can rapidly escalate into compulsive use (Kuss & Griffiths, 2012) [9]. The intermittent reinforcement schedules built into many apps and games — unpredictable rewards that sometimes come and sometimes do not — are especially potent drivers of habitual behavior, a phenomenon extensively documented in behavioral psychology since Skinner's foundational operant conditioning research.

Erik Erikson's psychosocial theory provides another useful lens. During the primary school years, children are engaged in resolving the tension between industry and inferiority — developing competence through mastery of skills. When gadget use substitutes for productive activities such as learning, creative play, and collaborative problem-solving, it can impede this developmental task, leaving children with underdeveloped competencies and heightened feelings of inadequacy in real-world settings (Erikson, 1963) [6]. Similarly, Vygotsky's sociocultural theory emphasizes that cognitive development occurs through social interaction within a zone of proximal development; excessive solitary gadget use may deprive children of the scaffolded social learning experiences necessary for optimal cognitive growth (Vygotsky, 1978) [15].

3. Psychological Dependency in Primary School Children

Psychological dependency on gadgets in primary school children manifests through a constellation of behavioral, emotional, and cognitive indicators. Researchers have identified several core features that distinguish problematic gadget use from typical recreational use.

3.1 Behavioral Indicators

Children exhibiting gadget dependency often display salience — the device becomes the dominant preoccupation in their daily lives, crowding out interest in other activities. They may experience mood modification, using screen time as the primary means of alleviating boredom, anxiety, or emotional distress. Tolerance — the need for increasing amounts of screen time to achieve the same level of satisfaction — has been documented in children as young as seven (Twenge & Campbell, 2019) [13].

Withdrawal symptoms, including irritability, aggression, restlessness, and dysphoria when devices are restricted, are among the most frequently reported concerns by parents and teachers (Anderson & Handelsman, 2020) [3].

Conflict with family members over device use and relapse into excessive use after periods of restriction are also characteristic. Notably, deception — hiding gadget use from parents, lying about the amount of time spent on devices — appears with concerning frequency and reflects the depth of psychological entrenchment in dependent children.

3.2 Emotional and Cognitive Impact

The emotional consequences of gadget dependency in this age group are multifaceted. Studies consistently link heavy screen use with elevated rates of anxiety and depressive symptoms in primary school children (Twenge et al., 2018) [13]. This association is mediated partly by sleep disruption: blue light emitted by screens suppresses melatonin production, delaying sleep onset and reducing sleep duration. Given that children aged 6–11 require 9–11 hours of sleep per night for optimal brain development, even modest sleep reductions can have cascading effects on mood regulation, attention, and academic performance (National Sleep Foundation, 2015) [11].

Cognitively, heavy gadget use has been associated with shorter attention spans and reduced capacity for sustained, effortful cognitive engagement. The rapid-fire stimulation characteristic of most digital content trains the brain to expect constant novelty and may erode the patience required for deep reading, complex problem-solving, and creative thought. Pagani et al. (2020) [12] found that television and screen exposure in early childhood predicted significantly worse classroom engagement and mathematics achievement in primary school, even after controlling for socioeconomic and family factors. While television is not equivalent to interactive gadget use, the mechanisms of passive overstimulation are broadly applicable.

3.3 Neurological Considerations

Neuroimaging studies, though still emerging in this field, have begun to reveal structural and functional brain differences associated with excessive screen use in children. Research published by the Adolescent Brain Cognitive Development (ABCD) Study — the largest long-term study of brain development in the United States — reported that children who spent more than two hours daily on screens had lower cognitive scores, and those with seven or more hours of daily screen time showed measurable thinning of the cortex in regions associated with attention and inhibitory control (Cheng et al., 2020) [4]. These findings parallel neurological changes documented in studies of substance addiction, lending weight to the behavioral addiction model.

4. Social Problems Associated with Gadget Overuse

Beyond individual psychological effects, excessive gadget use in primary school children generates a range of social problems that affect peer relationships, family dynamics, and broader community engagement.

4.1 Impairment of Social Skills

Social competence in childhood is built through repeated face-to-face interactions that demand reading of nonverbal cues, turn-taking, conflict resolution, and empathic responsiveness.

When screen time displaces these interactions, children may fail to develop the social repertoire necessary for healthy peer relationships. Research by Uhls et al. (2014) [14] demonstrated that even five days at a nature camp without screens significantly improved

children's ability to read nonverbal emotional cues, suggesting that screen exposure actively interferes with empathy development.

Children who spend excessive time on gadgets often struggle with initiating and sustaining conversations, interpreting facial expressions, and managing the ambiguity inherent in real-world social situations. These deficits may manifest as social withdrawal, rejection by peers, or reliance on online interactions as a substitute for in-person relationships — a pattern that can reinforce isolation and further deepen dependency.

4.2 Peer Relationships and Cyberbullying

While gadgets offer platforms for social connection, they also introduce new vectors for social harm. Primary school-age children are increasingly exposed to cyberbullying through messaging applications, gaming platforms, and social media, despite age restrictions. The psychological impact of cyberbullying in this age group is particularly severe because children lack the cognitive and emotional resources to contextualize online hostility or disengage effectively. Victims of cyberbullying report elevated rates of school refusal, anxiety, depression, and — in extreme cases — self-harm (Kowalski et al., 2014) [8].

Moreover, the social dynamics of gadget use can create new forms of peer pressure and social stratification. Children who lack access to the latest devices or popular games may experience exclusion, while those with unrestricted access may gain social currency through their digital prowess — dynamics that mirror and intersect with existing inequalities in social capital.

4.3 Family Dynamics and Parental Attachment

The impact of gadget overuse extends into the family system. When children retreat into screens during family time — at mealtimes, during transitions, or in the evening — it disrupts the quality of parent-child interaction essential for secure attachment and emotional development.

Research by McDaniel and Radesky (2018) [10] found that parental technofence — the intrusion of technology into parent-child interaction — was associated with children's behavioral problems, including increased externalizing behaviors such as aggression and hyperactivity.

Crucially, the study highlighted a bidirectional dynamic: children's problematic gadget use both contributes to and results from disrupted family interaction patterns.

Siblings' relationships are also affected. Children immersed in individual screen use have fewer opportunities for the imaginative cooperative play that builds prosocial skills and sibling bonds. The household atmosphere may become characterized by conflict over device access, parental anxiety, and a pervasive sense that digital technology is managing family life rather than being managed by it.

4.4 Academic and School-Related Problems

Schools have increasingly documented the disruptive social effects of gadget dependency.

Children who arrive at school fatigued from late-night screen use, emotionally dysregulated by violent or anxiety-provoking content, or socially isolated by online preoccupations present significant challenges for classroom management and peer integration.

Teachers report that some children struggle to engage with collaborative learning activities or physical education because these require the interpersonal skills and sustained attention that screen-dominated routines have eroded.

Additionally, the classroom itself has become a site of conflict over devices. Even where school policies restrict device use during school hours, children attempt to circumvent rules, and conflicts arising from social media interactions outside school frequently spill into the school environment, disrupting the social fabric of classrooms.

5. Risk Factors and Protective Factors

Not all children who use gadgets extensively develop psychological dependency or significant social problems. Research has identified a range of risk and protective factors that moderate the impact of gadget use on child development.

Key risk factors include: early initiation of gadget use (before age two, associated with greater dependence in later childhood); unsupervised, unlimited access to devices; use of gadgets as a primary means of soothing or entertainment by caregivers; presence of pre-existing emotional or behavioral difficulties, including attention-deficit/hyperactivity disorder (ADHD) and anxiety disorders; low parental digital literacy; family conflict; socioeconomic disadvantage; and exposure to age-inappropriate content (Twenge & Campbell, 2019; Gentile et al., 2017) [13, 7].

Protective factors include: active parental mediation — engaging children in discussion about content and modelling balanced technology use; consistent enforcement of screen time limits aligned with developmental guidelines; maintenance of a rich repertoire of offline activities, including sports, arts, and social play; strong parent-child attachment; high family cohesion; and access to supportive school environments with clear, enforced technology policies (Anderson & Handelsman, 2020) [3]. Notably, the type of screen use matters: educational, interactive, and co-viewed content is associated with substantially less harm than passive consumption of entertainment media (Wartella et al., 2016) [16].

6. Implications for Intervention

6.1 Family-Level Interventions

Evidence-based family interventions focus on restructuring the home digital environment rather than relying on willpower or prohibition alone. The American Academy of Pediatrics recommends that families develop a Family Media Plan that establishes device-free times and zones, prioritizes sleep and physical activity, and ensures that screen use does not displace essential developmental activities (AAP, 2016) [1]. Motivational interviewing techniques adapted for families have shown promise in helping parents negotiate balanced technology agreements with children without triggering oppositional responses.

Parent education programs focusing on digital literacy — helping parents understand the design features that drive compulsive use, such as autoplay, notification systems, and gamification — equip families to be more discerning consumers of technology. Parents who model balanced technology use and engage with their children in shared screen activities report better outcomes than those who respond to overuse with prohibitions alone.

6.2 School-Level Interventions

Schools play a pivotal role in both prevention and remediation. Digital citizenship curricula, integrated from primary school, can teach children critical thinking about screen content, self-regulation strategies, and the social-emotional dimensions of online interaction.

Teachers trained in recognizing the behavioral signs of gadget dependency can facilitate timely referrals to school counselors or child psychologists.

Structured outdoor and social play opportunities during school hours serve as important counterweights to sedentary screen exposure.

Schools that have implemented phone-free policies using storage pouches during school hours report improvements in peer interaction, classroom focus, and teacher-student relationships (Common Sense Media, 2019) [5].

6.3 Clinical and Policy-Level Responses

For children presenting with significant psychological dependency, individual or family-based cognitive-behavioral therapy (CBT) approaches have demonstrated effectiveness in addressing the cognitions and behavioral patterns that maintain excessive gadget use. Techniques drawn from addiction treatment — including motivational enhancement, behavioral activation, and relapse prevention — are increasingly adapted for use with children and adolescents (Kuss & Griffiths, 2012) [9].

At the policy level, governments in several countries have taken regulatory steps, including banning smartphone use in schools, imposing restrictions on the design of apps targeting children, and mandating digital literacy education. These structural interventions complement family and school-level efforts and signal social recognition of the problem as a public health concern requiring systemic response.

7. Conclusion

The evidence reviewed in this article paints a nuanced but deeply concerning picture of gadget use among primary school-age children. While digital technology offers genuine educational and social benefits when used purposefully and in moderation, its unregulated and excessive use is associated with measurable psychological dependency and a range of social harms that can have long-term developmental consequences.

The primary school years represent a window of both vulnerability and opportunity.

Vulnerability, because the developing brain is particularly susceptible to the reward-driven design of digital media; opportunity, because children at this age remain highly responsive to the guidance of parents and teachers, and because the habit patterns formed during these years will shape their relationship with technology throughout adolescence and adulthood.

Addressing this challenge requires coordinated action across multiple levels: families equipped with practical strategies and a deep understanding of the risks; schools committed to fostering offline social and cognitive competencies; clinicians alert to the signs of dependency and equipped with effective therapeutic tools; and policymakers willing to regulate the digital environment in ways that prioritize children's developmental needs over commercial imperatives.

Future research should focus on longitudinal studies that track the developmental trajectories of children with varying patterns of gadget use, the identification of the most effective intervention components across cultural contexts, and the neurological mechanisms that mediate gadget dependency in this age group. Only through sustained, evidence-based attention to this issue can society ensure that the digital revolution enhances rather than undermines the wellbeing of its youngest members.

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