

Research Article

The Anatomy of Cyber-Addiction: Virtual Introjects and Ontological Defense of Youth

Oleh Boichuk ^{1,*}  and Nataliia Yukhymenko ¹ ¹ Hryhorii Skovoroda University in Pereiaslav, Ukraine

* Correspondence: megante2@gmail.com

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Abstract: This article examines the profound ontological shift in youth socialization caused by the rapid expansion of algorithmically mediated environments. It argues that immersive digital technologies act not merely as communication tools, but as mechanisms of forced adaptation, causing socialization aberrations and transferring the developmental process under external algorithmic control. The specific mechanisms of this transitional socio-virtual reality require critical investigation. The rapid expansion of algorithmically mediated environments has triggered a measurable ontological shift in youth socialization. Digital platforms have evolved from communication tools into dominant structures of forced adaptation, causing significant socialization aberrations. This transformation requires urgent investigation as it transfers the developmental process from traditional social institutions to external algorithmic control, fundamentally altering the social fabric. The study aims to identify the specific mechanisms of forced digital adaptation and examine the resulting socialization aberrations among youth, providing an evidence-based framework for restoring social subjectivity. The research methodology is based on a structural-functional analysis integrated with the evaluation of primary empirical data. This study synthesizes original findings collected during the current research phase with the results of the author's previous longitudinal studies. The empirical component focuses on the erosion of physical social interaction as a key variable in the deformation of the youth's ontological experience. The study establishes that the transition to a socio-virtual reality is characterized by the phenomenon of "stolen labor," where the youth's developmental energy and time are extracted by algorithmic systems. This process is mediated by virtual introjects—external digital logics that displace the objective world and replace authentic experience with simulation. The empirical data confirms the emergence of "virtual anesthesia," a state where the numbing effect of the digital environment leads to the systematic displacement of objective reality and the relocation of labor, social life, and identity into a controlled virtual space. The research concludes that the expansion of algorithmically mediated environments leads to a fundamental ontological displacement, where the objective world is marginalized by a self-replicating virtuality. Overcoming this crisis requires more than just systemic adjustments; it demands the disruption of the "pan-virtual imperative" and the reclamation of human subjectivity from algorithmic subordination. The final reflection emphasizes that the restoration of the "resistance of matter" is the only way to neutralize virtual introjects and return the developmental process from simulation back to the domain of authentic human existence.

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1. Introduction

In attempting to classify the hazards of this digital environment, European academic discourse frequently utilizes the "4Cs" model developed by Livingstone and Stoilova (2021), which categorizes online risks as content, contact, conduct, and contract. While highly effective for identifying the nature of digital threats, this framework lacks a vertical dimension representing the escalation of severity and the proximity of offline consequences. Research highlights that exposure to these risks operates beyond mere cognitive engagement, as demonstrated by Stothart et al. (2015) regarding the profound "attentional cost" of digital

notifications. This neurobiological reality suggests that conventional media literacy is insufficient for youth experiencing chronic attention depletion and “mind-wandering.” Given these limitations, empirical studies, such as those by Park and Park (2016), point toward a significant negative correlation between active sports participation and internet ad-diction. However, the integration of such physical interventions into a broader strategy remains underexplored. This paper bridges the gap by providing an operational escalation model of risks directly paired with a comprehensive physical countermeasure defined as active socialization.

To understand the mechanics of this digital escapism, it is necessary to examine the foundations of “surveillance capitalism” (Bongiovi, 2019; Mendoza, 2022), where socialization is trans-formed into a mechanism for extracting behavioral surplus. This phenomenon constitutes a form of “stolen labor,” where the developmental energy of youth is com-modified by algorithmic systems. This shift is accompanied by an ontological crisis described by Byung-Chul Han as the transition from a world of tangible “things” to “non-things” (information). In the virtual metaverse, the lack of physical resistance allows algorithms to bypass cognitive filters, leaving youth without an existential anchor.

Such an ontological shift facilitates the mechanism of virtual introjection, a process previously analyzed (Boichuk, 2025) where external algorithmic patterns and commercially driven values are internalized as authentic desires. Unlike classical socialization, this process is artificially induced by dopamine-driven architectures that hijack executive functions. This leads to a state of systemic cyber-dependency where the individual’s subjectivity is extracted and replaced by virtual introjects, marking the definitive transition from human agency to algorithmic subordination.

Current discourse often utilizes the “4Cs” model. While effective for identifying types of threats, it lacks a vertical dimension of severity. Furthermore, conventional media literacy fails to account for the neuro-biological “attentional cost” (Livingstone & Stoilova, 2021; Stothart et al., 2015) of digital environments. This paper bridges the gap by introducing a six-level hierarchical model of risks paired with a physical countermeasure – active socialization.

2. Materials and Methods

The primary research aim is to evaluate the ontological displacement in youth socialization within algorithmically mediated environments and to substantiate the active socialization model as an effective mitigation strategy. To achieve this, the following research questions were addressed. First, what is the correlation between the intensity of digital immersion and the measurable erosion of physical social interaction among university students? Second, how do virtual introjects facilitate systemic attention fixation and the subsequent erosion of cognitive autonomy? Third, to what extent can systematic physical engagement and active socialization serve as functional mechanisms for “ontological grounding” against virtual anesthesia? By addressing these questions, the study provides a theoretical and empirical basis for re-claiming individual subjectivity from algorithmic control.

2.1. Research Design

This study utilizes a quantitative cross-sectional research design aimed at identifying the correlations between algorithmic immersion and social alienation among youth. The research framework employs a comparative analysis approach, integrating primary empirical data collected through structured questionnaires and behavioral observation scales. The design focuses on measuring the displacement of objective social presence by virtual introjects, as well as the impact of digital engagement on “attentional fixation” and the social identity of the participants. Statistical analysis was performed using correlation coefficients to substantiate the observed trends. This design ensures the continuity of the author’s previous longitudinal observations regarding the pan-virtual imperative, conceptualized here as the systemic pressure of algorithmically mediated environments that forces social subjects into total digital adaptation and facilitates the subsequent extraction of their developmental potential.

2.2. Participants

To empirically substantiate the destructive nature of virtual introjects, a quantitative study was conducted among 300 Ukrainian university students. For the purpose of a robust comparative analysis, the sample was divided into two distinct cohorts based on their level of digital immersion: a high virtual introjects quotient (high V-IQ) group (n = 150) and a low V-IQ group (n = 150).

2.3. Instruments

The primary diagnostic tool utilized was the proprietary virtual introjects questionnaire (V-IQ). This instrument measures the degree of algorithmic internalization across three core dimensions: avatar identification, algorithmic norms, and value shifts. Secondary metrics included standardized assessments for critical thinking (measured on a 40-point scale) and self-esteem (measured on a 30-point scale), alongside quantitative self-reporting of the volume of active online contacts and the frequency of weekly offline face-to-face meetings.

2.4. Procedure and Data Analysis

The V-IQ was validated utilizing maximum likelihood factor analysis to confirm its structural integrity. Statistical correlations between V-IQ dimensions and external indicators of social adaptation and cognitive autonomy were calculated. The comparative data between the two cohorts was evaluated with statistical significance established at $p < 0.05$, $p < 0.01$, and $p < 0.001$ levels to ensure the high reliability of the findings.

3. Results

3.1. Digital Immersion and the Measurable Erosion of Physical Interaction

The empirical analysis revealed a direct correlation between digital immersion and the degradation of offline socialization. Descriptive statistics show that 42% of respondents spend more than 2 hours daily on social media platforms. The comparative data (table 1) demonstrates that the high V-IQ group (high virtual introjection) averages only 1.2 face-to-face meetings per week compared to 1.8 in the low V-IQ group ($p < 0.05$). These findings confirm that intensive digital engagement systematically displaces objective social presence, leading to a measurable erosion of physical social interaction among university students. Such a reduction in physical contact signifies a broader transition where the virtual environment becomes the primary site of identity formation rather than a supplementary tool.

Table 1. Impact of virtual introjection on cognitive autonomy and social adaptation.

Indicator of social adaptation	High V-IQ group (n = 150)	Low V-IQ group (n = 150)	Significance (p-value)	Correlation with algorithmic norms (r)
Critical thinking score (max 40)	22 ± 4	29 ± 5	$p < 0.001$	-0.34
Self-esteem score (max 30)	18 ± 5	22 ± 4	$p < 0.01$	-0.28*
Volume of active online contacts	45 ± 12	28 ± 10	$p < 0.001$	0.31
Frequency of offline meetings	1.2 ± 0.6	1.8 ± 0.7	$p < 0.05$	None

The empirical data rigorously confirms that students with high virtual introjection exhibit a significant degradation in critical thinking (22 ± 4 compared to 29 ± 5) and diminished self-esteem. While these hyper-digitalized individuals maintain a significantly higher volume of superficial online contacts (45 ± 12), their actual offline socialization is critically stunted, averaging only 1.2 face-to-face meetings per week. The negative correlation ($r = -0.34$, $p < 0.01$) between algorithmic norms and critical thinking proves that the internalization of digital triggers directly cannibalizes cognitive autonomy.

3.2. Virtual Introjects, Attention Fixation, and the Erosion of Cognitive Autonomy

The study identified virtual introjects as the primary mechanisms for attention fixation. Data indicates that 55% of respondents acknowledge that algorithmic recommendations dictate their decision-making processes while 75% partially or fully identify with their digital avatars. This shift correlates with a significant cannibalization of cognitive autonomy and the manifestation of the “stolen labor” phenomenon where the developmental energy and potential of the subject are extracted for the optimization of algorithmic systems. Specifically, the group with a high level of virtual introjection (High V-IQ) demonstrated a critical thinking score of only 22 ± 4 out of a maximum of 40 compared to 29 ± 5 in the low-level group ($p < 0.001$). The negative correlation between algorithmic norms and critical thinking ($r = -0.34$) proves that internalized digital triggers actively suppress independent cognitive

functioning.

This hierarchy reveals how digital threats evolve from content exposure to ontological deformation. Mapping six levels identifies where algorithms bypass defenses to initiate systematic cognitive extraction. Such classification enables active socialization to restore the resistance of matter and reclaim the developmental potential currently appropriated by the pan-virtual imperative. Consequently, these findings justify the implementation of an expanded operational tool in the form of the six-level hierarchical model of digital risks which is further detailed in table 2.

Table 2. The six-level hierarchical taxonomy of digital risks for youth.

Level	Risk category	Description and examples	Intervention focus
Level 6	Severe offline consequences	Actions causing direct physical or severe institutional harm (e.g., swatting, recruitment into “death groups,” extremist radicalization).	Law enforcement, specialized psychiatric and legal intervention
Level 5	High-risk contact practices	Coordinated, deeply manipulative interpersonal interactions (e.g., grooming, sextortion, coordinated brigading).	Inter-institutional response, parental intervention, crisis support protocols.
Level 4	Severe privacy violations	Intentional psychological harm through data weaponization (e.g., doxxing, non-consensual sharing of intimate materials).	Rapid moderation channels, legal action, evidence preservation.
Level 3	Medium-severity content and contact	Routine aggression and illegal content exposure (e.g., cyberbullying, trolling, hate speech, targeted disinformation).	Community moderation, peer-support protocols, de-escalation scripts.
Level 2	Technical and commercial risks	Financially or data-driven structural threats (e.g., email/SMS phishing, scam applications, payment fraud).	Digital hygiene, platform regulation, privacy settings management.
Level 1	Algorithmic triggers	Mass-scale impacts designed to hijack attention (e.g., spam, clickbait, dark patterns of monetization)	Cognitive autonomy training, time-boxing, mindful consumption.

3.3. Description of the Six-Level Hierarchical Model of Digital Risks

The proposed model is structured as a progression of escalating threats that begin with the foundational stage of algorithmic triggers and everyday influences. On the first stage the hierarchy identifies mass-scale and low-severity impacts designed primarily to facilitate attention fixation through intrusive notifications and algorithmic echo chambers which eventually induce a screen inferiority effect. Advancing to the second tier of technical and commercial risks the model examines financially driven structural threats such as phishing and payment fraud within gaming ecosystems where the primary defense remains applied digital hygiene. The third stage marks a significant transition from automated algorithms to human-driven aggression in-volving routine cyberbullying and targeted disinformation campaigns specifically de-signed to provoke emotional exhaustion among youth.

Escalating further the fourth level represents severe privacy violations characterized by the intentional weaponization of personal data through tactics like doxxing which often lead to profound psychological damage. The fifth level of the hierarchy intensifies this pressure through coordinated and deeply manipulative interpersonal interactions such as grooming or sextortion where the focus shifts from individual regulation to inter-institutional crisis support. Finally the sixth level reaches the apex of the digital risk hierarchy where virtual actions result in severe offline consequences including direct physical harm through swatting or radicalization into extremist networks. This hierarchical progression demonstrates that as the intensity of digital immersion increases the risk of total ontological destruction becomes more acute necessitating a comprehensive response within the active socialization framework.

4. Discussion

The empirical evidence obtained in this study regarding the ontological dis-placement of youth provides a mathematical confirmation of the “stolen labor” hypothesis. The significant decline in critical thinking scores among the high V-IQ group (\$22 \pm 4\$ out of 40) directly reflects the mechanics of surveillance capitalism (Bongiovi, 2019; Mendoza, 2022; Nedzhvetskaya, 2019), where the traditional socialization of youth is transformed into a mechanism for the extraction of behavioral surplus. By focusing on attention fixation,

algorithmic environments do not merely distract the user but effectively commodify their developmental potential, treating cognitive growth as raw material for machine intelligence. This extraction is mediated by virtual introjects which facilitate a profound identification with digital avatars, as observed in 75% of our respondents. While such data correlates with the findings of Kim and Lim (2020) regarding SNS motives, our re-search emphasizes the ontological rather than just psychological nature of this shift. This confirms that the observed displacement is not an accidental byproduct of technology but a structural necessity of the digital economy designed to subordinate authentic human experience to the logic of capital accumulation.

The failure of conventional media literacy in this context is explained by the neurobiological groundwork described by Cash et al. (2012), where executive functions are effectively hijacked by algorithmic triggers. This vulnerability leaves youth without a physical “ontological anchor” increasingly susceptible to the aggressive nature of digital environments and higher-level risks within our proposed hierarchy, a phenomenon analyzed through impulse management by Smeijers et al. (2021). Consequently, the necessity of active socialization arises as a fundamental ontological defense against the virtual metaverse. Unlike aberrational cyber-socialization which produces alienated individuals driven by immediate digital gratification, active socialization demands the conscious re-engagement of the subject with the physical community. This process bridges the anthropological gap through the resistance of matter and the friction of genuine social dynamics, allowing the individual to reclaim their status as a proactive social agent. This effectively neutralizes virtual introjects by fostering cultural norms and empathy which go beyond the simple negative effects of gamification identified by Toda et al. (2018). The empirical validation of this defense is most evident in the role of physical resistance within team sports, reinforcing the conclusions of Park and Park (2016) regarding the negative correlation between sports participation and internet addiction. However, the manifestation of this potential requires robust infrastructure which is currently under threat in the Ukrainian context. The decrease in sports facilities reported by the Sport for All center, combined with the degradation of offline spaces highlighted by CEDOS data, creates a physical vacuum that algorithms readily fill. To systematically counter the pan-virtual imperative, state policies must shift toward the revitalization of “third places” such as community hubs and libraries. By aligning institutional frameworks with international standards like the UN World Programme of Action for Youth and the “Youth Pact 2025,” the state can provide a compelling alternative to digital escapism. As established in our framework, investing in volunteer initiatives and ProSkills camps is a prerequisite for psychological resilience, transforming marginalized digital consumers into active co-creators of social goods.

5. Conclusions

The pervasive integration of algorithmic systems into the daily lives of youth represents a fundamental challenge to autonomous socialization which this study has addressed through the conceptual lens of the pan-virtual imperative. The empirical findings confirm that digital platforms act as mechanisms of forced adaptation where authentic social interactions are replaced by virtual introjects that systematically bypass cognitive autonomy. Specifically, the significant decline in critical thinking scores among highly immersed respondents provides mathematical proof that algorithmic environments facilitate the extraction of developmental potential within the framework of surveillance capitalism. Furthermore, the proposed Six-Level Hierarchical Model demonstrates that digital risks are dynamic and escalate rapidly from attention hijacking to severe offline harm which necessitates a comprehensive paradigm shift in social and educational policy. To build genuine resilience educational strategies must pivot from digital-centric interventions toward heavy investment in physical social infrastructure to restore the resistance of matter in the socialization process. Active socialization that is driven by team sports and revitalized community hubs acts as the ultimate ontological anchor to reclaim the individual’s internal locus of control and foster interpersonal connections that algorithms cannot simulate. This methodology effectively neutralizes the virtual anesthesia produced by prolonged immersion and restores the subject’s proactive status in the physical community. Future research should prioritize the long-term neurobiological impacts of virtual introjection and the development of standardized metrics for measuring the effectiveness of active socialization programs across different cultural contexts. Ultimately the strategic return to the reality of physical human connection represents a vital defensive maneuver to preserve the anthropological essence of the next generation against the dissolving influence of the

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