

The background features a dark blue gradient with faint, overlapping circular patterns and numerical scales. Some of the visible numbers include 40, 150, 170, 180, 200, 220, 230, 240, 250, and 260. The text is centered and rendered in a clean, white, sans-serif font.

THE METAVERSE

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CHILD AND ADOLESCENT PSYCHIATRY

DIFFERENT ASPECTS OF A MODERN PHENOMENON

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# WHAT IS THE METAVERSE?

- Definition: A collective virtual shared space, created by the convergence of physical and digital reality

## Key Features:

- Persistent (never stops)
- Decentralized (blockchain)
- Interactive (VR/AR, avatars)
- Economy-driven (digital assets, NFTs, cryptocurrencies)

# EVOLUTION OF THE METAVERSE

## Timeline:

- 1992: Snow Crash (term coined by Neal Stephenson)
- 2003: Second Life (early virtual world)
- 2010s: VR/AR advancements (Oculus, Pokémon GO)
- 2021+: Meta (Facebook), Decentraland, Roblox

# KEY TECHNOLOGIES POWERING THE METAVERSE

- Virtual Reality (VR) & Augmented Reality (AR)
- Blockchain & NFTs (ownership of digital assets)
- AI & Machine Learning (smart avatars, NPCs)
- 5G & Edge Computing (low-latency interactions)

# APPLICATIONS OF THE METAVERSE

- Entertainment: Fortnite, Roblox concerts
- Social Interaction: Horizon Worlds, VRChat
- Work: Virtual offices (Microsoft Mesh, Meta Workrooms)
- Education: Virtual classrooms, immersive training
- E-commerce: Digital fashion, NFT marketplaces

# NEGATIVE ASPECTS

- Proportion of metaverse adolescents increases, discussing impact is necessary
- A developmental period with brain significant changes
- Adolescents more susceptible to internet addiction than young adults during COVID-19, less developed cognitive control system

- Adolescence characterized by more complicated and hierarchical peer relationships with broader social networks, increased use of social media affected teenagers socially and emotionally
- Time on social media positively correlated with ill-being, using social media related to higher psychiatric symptoms
- Higher levels of depression, anxiety, lower self-esteem, especially among girls

- Heavy social media use showed a positive correlation with suicidal risk
- Sharing information about self-harm or suicide plans lead to normalizing pathologic behaviors
- Thus, teenagers with immature self-regulatory functions more likely to act on metaverse impulses, socially and emotionally affected

# ADDICTION

- Digital addiction gained popularity as internet increasingly permeated our lives
- Potential for addiction to computer, smartphone games, social media become a concern worldwide
- Children and adolescents big targets, because of incomplete cognitive control system, increased reward-seeking and risk-taking behavior
- Younger age increases risk of symptoms of addiction

- Brain imaging studies of internet gaming disorder, activation in brain regions associated with reward, dopamine-mediated reward mechanisms
- Reduced activity in impulse control areas, functional connectivity in brain networks involved in cognitive control, executive function, motivation, reward

- Metaversely, VR provides a more real and immersive service, can cause blurred recognition between reality and virtuality
- Recent research has shown that VR gaming more addictive than other forms of gaming
- Because metaverse is based on multisensory interactions, involving auditory, visual, and haptic (touch) feedback, a 3D feeling of space

- Replicating reality considered most addictive characteristic of media
- Previous research suggested feelings of spatial presence leads to stronger emotional arousal, enjoyment
- Metaverse will be most realistic media, thus most addictive form of media

# ANTISOCIAL BEHAVIOR, CYBERBULLYING, CYBERCRIME

- Cyberaggression, including behaviors do not typically occur in face-to-face setting
- People in virtual environment feel more confident, causing sexual harassment, racism, other kinds of aggression within video game communities
- Cybercrime can target adolescents, Sexual abuse in adolescents has been frequently reported, teens lacking familial support considered more vulnerable

# IDENTITY CONFUSION

- Research stated negative, violent, abusive experiences in virtual world causes similar psychological, physiological responses in real world
- Reduced sensitivity and empathy in metaverse, because of anonymity, leads to real world violence
- In metaverse, users can use various avatars, sense of embodiment leads to identifying users with their avatar

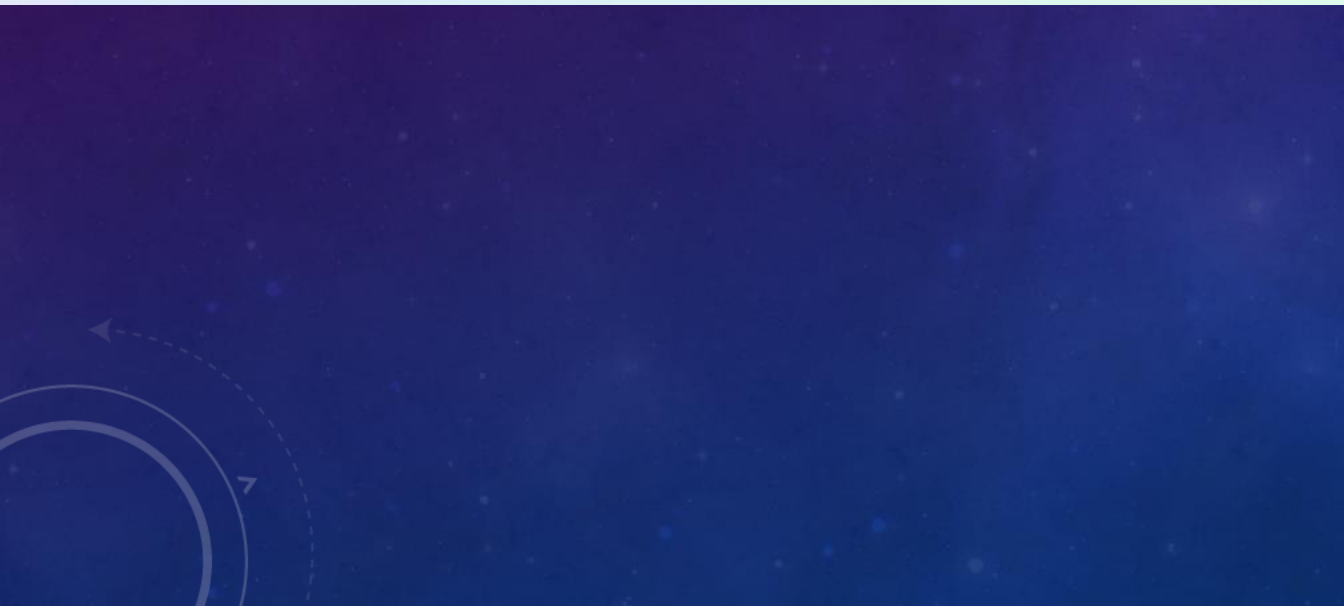
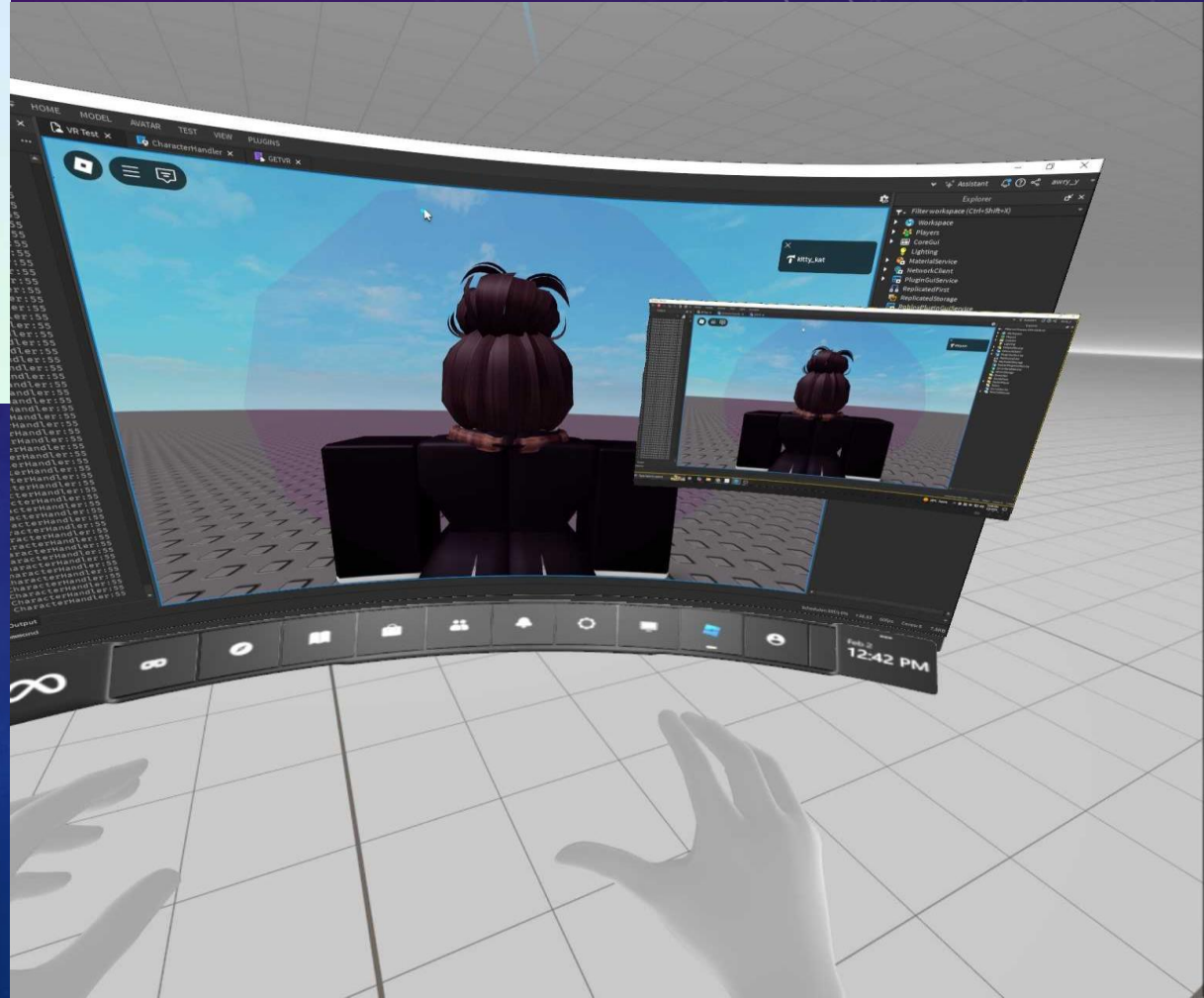
- Virtual profiles can provoke habits of comparing oneself with others, leading to unrealistic standards of beauty and lifestyle, worsening body dysmorphia
- Massively using metaverse and avatar can lead to identity confusion in children and adolescents, as adolescence is critical for identification formation

# POSITIVE ASPECTS

- Metaverses already used in various ways despite being a relatively recent concept

Some examples:

- Roblox, a VR platform, one creates own space and games on various topics such as shooting, strategy, communication, decorate their characters, purchase accessories using virtual currency
- Mainstream users ages of 6 and 16, children play not only in world created by others, also as creators for others. Teenagers make money by creating a virtual world and providing it to others



- Zepeto, one of the most frequently used metaverse platforms in Korea
- Users create a 3D avatar that represents themselves and use it to communicate with others
- Various activities, such as games and educational roleplay
- Teachers can select a classroom map and provide space for students to interact with each other through voice or messages



- In psychiatry and psychology, opportunities to consult professionals uniquely and potentially more comfortably by avatars
- Using avatars can particularly benefit individuals with high social anxiety
- Group therapy sessions in which meditation and mindfulness were practiced were also possible
- Metaverse-based social skills training program for children with autism spectrum disorder

- Children's emotional changes detected using biometric information collected through wearable devices, emotions such as anxiety and anger can be managed
- Personalizing environments for individuals in exposure therapy, for children with ASD, ADHD to practice social interactions, for adolescents with anxiety to practice mindfulness and meditation

# DATA COLLECTION AND VISUALIZATION

- valuable tool for collecting specific functional data to shape therapies and present information in an engaging, visually appealing manner

# TELEHEALTH AND SPECIFIC INTERVENTIONS

- Interventions for specific conditions such as phobias, PTSD
- Virtual reality exposure therapy (VRET) shown efficacy in treating specific phobias and PTSD
- Accurately simulate fear-inducing stimuli and environments, such as specific phobias or traumatic memories

- In contrast to in-vivo exposure, VRET has advantage of being able to closely mimic distressing situation in a safe, controlled artificial environment
- Surveys shown people may prefer VRET over traditional therapy
- Especially in younger patients, therapy with VR may be preferable because their fascination with this technology may persuade them to engage in treatment

- Increasing interest of using metaverse as a telehealth platform
- Metaverse-based clinics utilized to enhance traditional telehealth for clinical consultations while introducing more immersive technologies for coaching and mentoring
- Figure shows a metaverse mental health consultation in progress inside such a clinic

Dr. Hryniewicki



- In its simplest form, the metaverse can serve as a psychoeducation and engagement portal
- Engaging conversational AI avatars, can guide young people through managing their uncertainties, potentially preventing future escalations

# CULTURAL ADAPTABILITY AND SOCIAL CONNECTION

- Adaptation to cultural groups, communities, making them versatile in addressing youth mental health challenges
- Provides global clinical and supportive interventions, overcoming geographical boundaries, effectively improving access to specialized care

# IMPLEMENTATION CHALLENGES

## Accessibility

- A significant obstacle is access, may create a digital divide, inequalities of care
- Although can help overcome barriers to mental health services, still require digital infrastructure such as electricity, electronic devices, reliable internet connection
- This would exacerbate inequalities in care, particularly among low-income groups
- Digital inequalities around cost may need governing for facilitation of access

## Digital literacy

- Competency and confidence of current mental health workforce around digital literacy
- These emerging technologies provide an additional dimension to contemporary skillsets; education providers need to consider a curriculum design focusing on metaverse