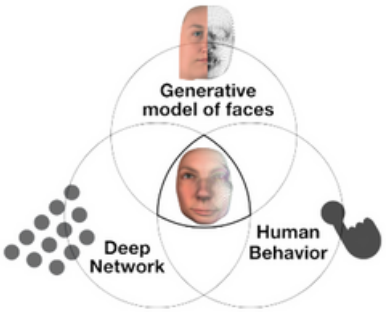
How Well Do Deep Neural Networks Correspond to Human Cognitive Functions?

Authors: Cemile Ceyda Sarı & Betül Bayrak

The rise of machine learning reflects our efforts to understand human learning. Nadler et al. (2023) examined the similarity between Deep Neural Networks (DNNs) and human color perception. While DNNs achieved high accuracy in classification tasks, they failed to replicate human perception. This finding highlights that strong task performance does not equal cognitive equivalence and raises concerns for critical fields like law and healthcare. .

In terms of language processing, Galke et al. (2024) showed that DNNs and humans use compositional structure in language. It demonstrated that when trained on more structured languages, neural networks perform better and generalize more systematically, which is similar to how humans find regular structures easier to learn. Still, DNNs don't learn from real-life experience or adapt as flexibly as humans do.



Apart from individualistic cognitive scopes, scholars such as Pulvermüller et al. (2021) and Goodfellow et al. (2016) have proposed the notion that DNNs struggle to replicate certain concepts, including emotion, intuition, and plasticity. For instance, human memory is adaptive and prone to misinformation and imagination. On the other hand, DNNs have uniform memory systems unless retrained. Also, they are open to “catastrophic forgetting” when exposed to new data.

Trending Topics in Psychology
From Mind to Machines

About This Bulletin

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This bulletin presents a collection of thought-provoking reviews by graduate students. Our first aim is to explore some of the current and compelling topics in psychology and cognitive science today, from the intersection of artificial intelligence and mental health to the emotional impacts of social media and workplace burnout. These contributions reflect both academic discussions and practices.

August 2025,
Yeditepe University

Can AI Do Psychotherapy?

Author: Nurten Kübra Ekşi

As AI becomes increasingly embedded in daily life, its role in traditionally human-dominated fields, such as psychotherapy, is being explored. Tools like "Woebot" and "Wysa" use CBT and DBT frameworks to deliver mental health support via conversational interfaces. Studies have shown that these tools reduce symptoms of anxiety and depression, particularly in individuals with mild to moderate symptoms (Darcy et al., 2021; Fitzpatrick et al., 2017; Inkster et al., 2022). They offer constant availability and a judgment-free space, which can be encouraging for those hesitant to begin psychotherapy (Inkster et al., 2022).

However, AI lacks genuine empathy, emotional understanding, and nonverbal communication skills, which are essential for therapeutic relationships. It cannot replace the depth of clinical diagnosis, trauma work, or therapeutic alliance (Vaidyam et al., 2019).

While AI can deliver psychoeducation and coping strategies, it should serve as a supplementary resource, not a substitute for trained therapists. Ethical concerns also arise: Who is responsible if an AI gives harmful advice? Can AI truly respect autonomy and confidentiality?

Until these questions are addressed through strict regulation and professional oversight, AI should remain a supportive tool, not a standalone solution.

VR Application in Psychotherapies

Authors: Bilge Türktaş & Meyçem Doğrusoy

- The core of Virtual Reality (VR) treatment is around exposure therapy, which entails repeatedly exposing patients to anxiety-inducing stimuli without the risks associated with real-life exposure.
- One significant application of VR treatment can be addressing addiction, particularly related to alcohol, social media, nicotine, and gambling.
- Through VR treatment, patients may learn addiction recovery by practicing coping strategies, enhancing their resilience, and understanding how to manage cravings.
- Another area where VR treatments show promise is in treating phobias, including fears of heights, anxiety, flying, and various animal phobias.
- This approach can be particularly advantageous for patients who do not respond well to traditional therapy, as well as for younger individuals who may be more enthusiastic about engaging with innovative, technology-driven methods.

Clinical Implications
Mental health professionals can enhance treatment outcomes by incorporating VR-based exposure therapy.

While VR is not a standalone treatment, it serves as a valuable tool for those who are likely to benefit from exposure therapy, especially within the framework of Cognitive Behavioral Therapy. Furthermore, VR enables the creation of customized and reproducible therapeutic scenarios, addressing gaps where traditional exposure therapies may fall short. This flexibility helps therapists adjust treatments as needed. Training more mental health professionals to conduct virtual reality sessions can significantly benefit the mental health community and society as a whole.

Trending Topics in Psychology: From Mind to Machines

Psychology continues to evolve. As a discipline, psychology is adapting to technological advancements, addressing societal challenges, and expanding into new domains of human experience. The themes of this bulletin encompass some recent developments in clinical psychology (such as VR-based therapy), critical questions about AI's cognitive capacities, the emotional effects of digital interactions and contents, and the shifting roles of parents in an increasingly digital world.

Each part reflects the authors' engagement with real-world questions and recent academic discussions. We invite you to explore these fresh perspectives and join us in rethinking the frontiers of psychology in the 21st century.

August 2025,
Yeditepe University

The Echo of Emotions: Understanding Emotional Contagion Theory

Author: Gizem Dilan Anıl

Social media has become an important part of daily life. In general, social media platforms enable users to share information and emotional experiences. Emotional Contagion Theory (Hatfield, Cacioppo, & Rapson, 1994) explains how individuals, whether consciously or unconsciously, adopt the emotions of others. Social media may amplify this process, allowing emotions to spread rapidly across large audiences.

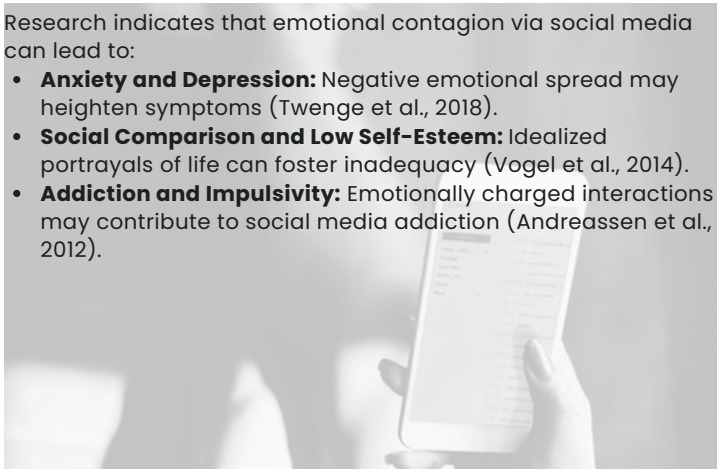
Emotional contagion on social media occurs through key mechanisms: Automatic Mimicry and Neural Mirroring. Users unconsciously imitate facial expressions, language, and emotional tones in posts (see for a review, Neumann & Strack, 2000), while mirror neurons facilitate the integration of this emotional content.

Prolonged social media use can align individuals' emotional states with the consumed content; for example, frequent exposure to anxiety-inducing news may trigger generalized stress.

Dominant emotions within online communities spread quickly, and viral content can strongly influence mass emotional responses (Ferrara & Yang, 2015).

Research indicates that emotional contagion via social media can lead to:

- **Anxiety and Depression:** Negative emotional spread may heighten symptoms (Twenge et al., 2018).
- **Social Comparison and Low Self-Esteem:** Idealized portrayals of life can foster inadequacy (Vogel et al., 2014).
- **Addiction and Impulsivity:** Emotionally charged interactions may contribute to social media addiction (Andreassen et al., 2012).



Workplace Burnout: The Unseen Struggle

Author: Ezgi Şentürk Akpunar

Workplace burnout is more than fatigue; it is a syndrome caused by chronic, unmanaged job stress, specifically linked to work rather than general life experiences (WHO, 2019).

Burnout harms both physical and mental health, lowering productivity and increasing turnover. Unlike general stress or depression, it directly affects deadlines, work quality, team morale, and employee retention (Hillert et al., 2020).

BURNOUT MATTERS: EXHAUSTED EMPLOYEES, EXHAUSTED RESULTS
Nearly half of U.S. employees report feeling burned out, and they are three times more likely to seek new jobs (SHRM, 2024).
Common Symptoms (Burisch, 2001):

- **Exhaustion & Sleep Disorders**
- **Cognitive Issues:** Poor concentration, memory problems, indecisiveness
- **Emotional Effects:** Cynicism, loss of empathy, disillusionment, relationship issues
- **Physical Problems:** Breathing difficulties, chest tightness, back pain, nausea, substance use

What are the causes?
Christina Maslach's six main areas contributing to burnout (Maslach & Jackson, 1981):

- Excessive workload
- Lack of control,
- Insufficient reward
- No workplace community
- Perceived unfairness
- Conflict in personal and company values

Job Demands–Resources (JD-R) Model: A Solution? (Demerouti et al., 2001)

- **Job Demands:** too much workload, emotional stress
- **Low Resources:** poor support, no autonomy

Burnout: demands > resources! So, let's increase the resources, such as managerial support, and give autonomy to employees.
Organizations play a key role in prevention by clearly defining roles, promoting fairness and recognition, fostering community, balancing workloads, and ensuring actions align with stated values (Steimnitz & Auerbach, 2024).

Burnout is not an individual weakness but a systemic problem rooted in organizational structures, leadership, and value misalignment—requiring systemic solutions, not just personal coping strategies.

How Social Media Affects Self-Esteem in Young Adults?

Authors: Begüm Özdemir & Şevval Toker

Today, social media has started to play a significant role in the lives of young people, and this situation is increasing day by day. It has begun to affect individuals' self-esteem, self-confidence, perception of beauty, communication, and relationships with others (e.g., Perloff, 2014; Vogel et al., 2014).

For young adults, the idealized self created by social media and the actual self can be a crucial point to discuss. *In this case, the consequences occur when the difference between the idealized self and the authentic self is too significant*. For example, loss of self-confidence, constantly comparing themselves with others based on social media's beauty standards, dissatisfaction, identity confusion, and some psychological consequences.

If media reading skills and digital awareness training are made widespread in universities, is it possible to increase the positive effects on young people's self-esteem?

Digital Parenting: Its Effects on Children and Adolescents

Authors: Çiğdem Atilla & Selin Türkay

Parents are encouraged to adopt positive digital parenting, which means guiding, empowering, and supporting children while using digital tools to help them reach their potential (Milovidov, 2020). Manap (2024) recommends awareness programs in schools, brochures, and public service announcements to promote positive digital role modeling and address digital neglect as child neglect. These initiatives should particularly target parents of young children (ages 0–6).

Milovidov (2020) suggests no direct digital exposure for babies under three months, as early development depends on real-world interaction. From ages 4–8, controlled use of educational apps and games can enhance academic skills and creativity. At 9–12, as children start using social media, parents should educate them about risks and responsible behavior. During adolescence, autonomy becomes crucial, but so does protecting teens from risks like cyberbullying. Social media can aid self-expression and skill-building, but requires guidance.

In adolescence, setting clear rules matters, but overly restrictive parenting (e.g., constant monitoring or punishment) can harm trust and push teens toward risky behaviors. Instead, parents should explain rules, listen to opinions, and encourage open dialogue. Autonomy-supportive and active mediation approaches lead to safer online behavior and better communication outcomes (Young & Tully, 2022).

The Effects of Cartoon Content on Children's Mental Health

Authors: Zeynep Büşra Taşyürek & Kübra Nur Sertoğlu

In the era of rapidly evolving digital media, cartoons hold a significant place in the daily lives of young children. These colorful and dynamic visual narratives not only capture children's attention but are now accessible around the clock, often with minimal parental supervision.

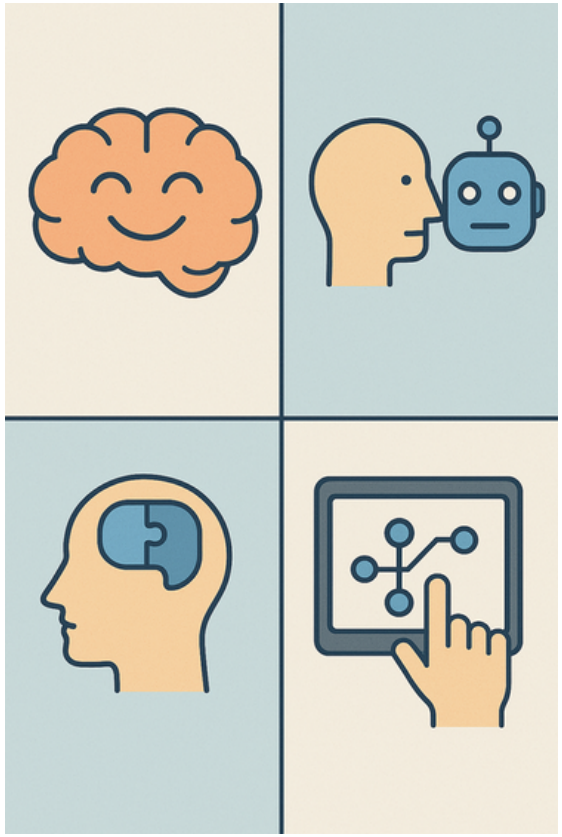
Cartoons can function as potent tools of symbolic communication that shape children's cognitive and emotional development (Piaget, 1962). According to Jean Piaget's theory of cognitive development, children aged 2 to 7 are in the pre-operational stage, where distinguishing between fantasy and reality is challenging. Consequently, exposure to violent behaviors in cartoons may lead children to perceive such actions as acceptable problem-solving strategies (Imtiaz & Ghani, 2023).

In terms of social learning, cartoons promote positive role modeling for developing empathy, cooperation, and understanding (Bandura, as cited in Imtiaz & Ghani, 2023). However, many contemporary popular cartoons tend to normalize violence, reinforce gender stereotypes, and propagate unrealistic body images (Anderson & Bushman, 2001; Gentile et al., 2011).

Given these findings, it is imperative for parents to carefully select age-appropriate content and foster media literacy from an early age. Media producers should collaborate with child development and psychological experts to create responsible and developmentally appropriate content.

References

Al-Mansoori, F. A., Hassan, M. A., & Mahmoud, L. I. (2022). Exploring cultural differences in job burnout: A study of six Arab social work environments. International *Journal of Political and Social Sciences, 7*(1).
Anderson, C. A., & Bushman, B. J. (2001). Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: A meta-analytic review of the scientific literature. *Psychological Science, 12*(5), 353–359.
Andreassen, C. S., Torsheim, T., Brunborg, G. S., & Pallesen, S. (2012). Development of a Facebook addiction scale. *Psychological Reports, 110*(2), 501–517.
Burisch, M. (2001). Burnout-Syndrom. Socialnet Lexikon. https://www.socialnet.de/lexikon/Burnout-Syndrom
Chou, H. T. G., & Edge, N. (2012). "They are happier and having better lives than I am": The impact of using Facebook on perceptions of others' lives. *Cyberpsychology, Behavior, and Social Networking, 15*(2), 117–121.
Darcy, A., Daniels, J., Salinger, D., Wicks, P., & Robinson, A. (2021). Evidence for the effectiveness of Woebot in reducing symptoms of depression and anxiety. *JMIR Mental Health, 8*(2), e15591.
Del Vicario, M., Vivaldo, G., Bessi, A., Zollo, F., Scala, A., Caldarelli, G., & Quattrociocchi, W. (2016). Echo chambers in online social networks. *Scientific Reports, 6,* 37825.
Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands–resources model of burnout. *Journal of Applied Psychology, 86*(3), 499–512.
Fitzpatrick, K. K., Darcy, A., & Vierhile, M. (2017). Delivering cognitive behavior therapy to young adults with symptoms of depression and anxiety using a fully automated conversational agent (Woebot): A randomized controlled trial. *JMIR Mental Health, 4*(2), e19.
Ferrara, E., & Yang, Z. (2015). Measuring emotional contagion in social media. *PLOS ONE, 10*(11), e0142390.
Freudenberger, H. J. (1974). Staff burn-out. *Journal of Social Issues, 30*(1), 159–165.
Galke, L., Ram, Y., & Raviv, L. (2024). Deep neural networks and humans both benefit from compositional language structure. *Nature Communications, 15*(1), 10816.
Gentile, D. A., Coyne, S., & Walsh, D. A. (2011). Media violence, physical aggression, and relational aggression in school-age children: A short-term longitudinal study. *Aggressive Behavior, 37*(2), 193–206.
Goodfellow, I., Bengio, Y., & Courville, A. (2016). Deep learning. MIT Press.
Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1994). *Emotional contagion.* Cambridge University Press.
Hillert, A., Albrecht, A., & Voderholzer, U. (2020). The burnout phenomenon: A résumé after more than 15,000 scientific publications. *Frontiers in Psychiatry, 11,* 519237.
Huesmann, L. R., Moise-Titus, J., Podolski, C. L., & Eron, L. D. (2003). Longitudinal relations between children's exposure to TV violence and their aggressive and violent behavior in young adulthood: 1977–1992. *Developmental Psychology, 39*(2), 201–221.
Imtiaz, S., & Ghani, U. (2023). Exposure to violent cartoons and aggressive behavior in children: A controlled experimental study. *Journal of Child and Adolescent Behavioral Science, 11*(1), 45–62.
Inkster, B., Sarda, S., & Subramanian, V. (2022). An empathy-driven, conversational artificial intelligence agent (Wysa) for digital mental well-being: Real-world data evaluation. *Frontiers in Digital Health, 4,* 10425.
Levine, M. P., & Murnen, S. K. (2009). "Everybody knows that mass media are/are not [pick one] a cause of eating disorders": A critical review of evidence for a causal link between media, negative body image, and disordered eating in females. *Journal of Social and Clinical Psychology, 28*(1), 9–42.
Manap, A. (2024). The effect of digital parenting awareness on children's emotion regulation skills. *Iğdır Üniversitesi Sosyal Bilimler Dergisi.*
Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Occupational Behaviour, 2*(2), 99–113.
Maslach, C., & Leiter, M. P. (2016). Understanding the burnout experience: Recent research and its implications for psychiatry. *World Psychiatry, 15*(2), 103–111.
Milovidov, E. (2020). *Parenting in digital age - Positive parenting strategies for different scenarios.* Council of Europe.
Nadler, E. O., Darragh-Ford, E., Desikan, B. S., Conaway, C., Chu, M., Hull, T., & Guilbeault, D. (2023).Divergences in color perception between deep neural networks and humans. Cognition, 241, 105621.
Neumann, R., & Strack, F. (2000). "Mood contagion": The automatic transfer of mood between persons. *Journal of Personality and Social Psychology, 79*(2), 211.
Perloff, R. M. (2014). Social media effects on young women's body image concerns: Theoretical perspectives and an agenda for research. *Sex Roles, 71*(11–12), 363–377.
Piaget, J. (1962). Play, dreams, and imitation in childhood (C. Gattegno & F. M. Hodgson, Trans.). W. W. Norton. (Original work published 1945)
Pulvermüller, F., Tomasello, R., Henningsen-Schomers, M. R., & Wennekers, T. (2021). Biological constraints on neural network models of cognitive function. *Nature Reviews Neuroscience, 22*(8), 488–502.
Schaufeli, W. B. (2017). Burnout: A short socio-cultural history. In S. Neckel, A. Schaffner, & G. Wagner (Eds.), Burnout, fatigue, exhaustion: An interdisciplinary perspective on a modern affliction (pp. 105–132). Springer.
Steinnitz, R., & Auerbach, A. (2024, September 6). Understanding and addressing burnout in the workplace. Forbes.
Twenge, J. M., Joiner, T. E., Rogers, M. L., & Martin, G. N. (2018). Increases in depressive symptoms, suicide-related outcomes, and suicide rates among US adolescents after 2010 and links to increased new media screen time. *Clinical Psychological Science, 6*(1), 3–17.
Vaidyam, A. N., Wisniewski, H., Halamka, J. D., Kashavan, M. S., & Torous, J. B. (2019). Chatbots and conversational agents in mental health: A review of the psychiatric landscape. *The Lancet Digital Health, 1*(6), e255–e266.
Valkenburg, P. M., & Piotrowski, J. T. (2017). Plugged in: How media attract and affect youth. Yale University Press.
Vogel, E. A., Rose, J. P., Roberts, L. R., & Eckles, K. (2014). Social comparison, social media, and self-esteem. Psychology of Popular Media Culture, 3(4), 206–222.
World Health Organization. (2019, May 28). Burn-out an "occupational phenomenon": International classification of diseases.
Young, R., & Tully, M. (2022). Autonomy vs. control: Associations among parental mediation, perceived parenting styles, and U. S. adolescents' risky online experiences. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 16*(2).



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