THESIS BOOKLET

Evelin Horváth

From dust you are, to pixel you will return

Analysis of audience attitudes
towards anthropomorphic virtual characters for marketing purposes

Supervisors:

Tamás Bokor, Phd. habil. Associate Professor

Ágnes Veszelszki, PhD. Associate Professor

Budapest

2025

Corvinus University of Budapest

Institute of Marketing and Communication Sciences

Department of Communication and Media Science

THESIS BOOKLET

Evelin Horváth

From dust you are to pixel you will return

Analysis of audience attitudes
towards anthropomorphic virtual characters for marketing purposes

Supervisors:

Tamás Bokor, Phd. habil. Associate Professor

Ágnes Veszelszki, PhD. Associate Professor

Table of contents

I. Research background and justification for the selection of the topic

The famous French fashion house Balmain launched its Autumn 2018 campaign with three new models, Shudu, Margot, and Zhi, both online and offline (Guthrie, 2020). It is pretty common in the fashion industry for a brand to present its new collection with a team of models selected for the promotion period. In this case, however, Balmain's new representatives were utterly different from the models the company had previously employed: Shudu, Margot, and Zhi are not real people but anthropomorphic, human-like virtual characters created using CGI technology (computer-generated imagery; e.g., Abbott, 2006; Ahn et al., 2022; Cho, 2023). To an average viewer without any profound visual experience, digitally drawn characters have a fully human-like physical appearance. Their realistic nature is reinforced by the fact that some anthropomorphic virtual characters even have fictitious internal characteristics and recognizable personality traits, just like real people. The creators often create separate social media profiles for them: scrolling through the posts, the content posted on the profiles can also give the impression of a real person, as they regularly document important moments in the virtual characters' "lives". Further explanation for their growing popularity is that, due to their innovative technological background, anthropomorphic virtual characters are attention-grabbing, and they can generate a lot of media and audience interest (Baumgarth, 2021), which is why many brands choose to collaborate with a popular virtual influencer or even design their own virtual brand ambassador.

Although anthropomorphic virtual characters are gaining ground in the marketing industry and their business opportunities are expanding as technology advances, little is known about how viewers perceive virtual characters for marketing purposes and what types of characters viewers would like to see in different kinds of marketing content. As there is a gap in the research on virtual character use in specific market segments (Choudhry et al., 2022), this study can provide new knowledge for communication and media professionals and those interested in the topic, as it has the additional objective of examining the use of characters for marketing purposes not only in general but also from a product- and service-specific aspect. This doctoral dissertation, therefore, aims to contribute to filling the aforementioned research gap.

One of the key concepts of this dissertation is the anthropomorphic virtual character. The group of anthropomorphic systems, meaning systems that are human-like in terms of their external and/or internal characteristics as perceived by their recipients, includes non-human agents other than virtual characters, such as humanoid robots, or certain types of AI, such as conversational

AI (Udvary, 2020). The author considers non-human agents any system capable of performing real or virtual actions autonomously without user intervention or giving the recipient the appearance of autonomy.

Epley and colleagues (2007) clearly distinguish the concept and process of anthropomorphism from personification, as they describe anthropomorphization as a more complex process. While the former refers to the endowment of non-living agents with living characteristics, anthropomorphization is a much more complicated phenomenon in which the recipient associates human-specific character traits, motivations, autonomous volition, and emotional states with the given human-like non-human agent. Previously, Leyens et al. (2003) also addressed the process of anthropomorphization: they considered the endowment of human emotions one of the most essential features. Epley and co-authors (2007) distinguish several motivations for anthropomorphism, among which perceived similarity stands out. According to Cohen (2014), anthropomorphization also plays a vital role in marketing, as perceived similarity and the positive emotions it evokes encourage potential consumers to be curious about the brand, want to learn about it, and even commit to it long-term. The research results of Chen (2017) also confirm the above: anthropomorphism positively impacts both the receptive attitude towards the marketing content and the brand, increases the attention paid to the marketing content, and stimulates the willingness to buy.

In terms of virtual character creation and character use for marketing purposes, it is paramount to define the target group, assess the opinions and needs of the recipients, and know them precisely (McDermott, Stead & Hastings, 2005). According to research findings (Sands et al., 2022; Baklanov, 2019), Generation Y women are the most significant part of the follower base of anthropomorphic virtual influencers on social media. Others (Wibawa et al., 2022), however, also include members of Generation Z in the target audience of anthropomorphic virtual characters, explaining that Generation Z youth born into the digital age have a strong demand for technological innovation and are therefore more open to innovative digital products in marketing contents. There is no consensus on the gender and age groups for which anthropomorphic virtual characters can be considered an effective marketing tool. The first question of the research examines, in general, the perceptions of recipients of different genders and age groups regarding the use of anthropomorphic virtual characters for marketing purposes.

> Q1 = What are the gender and age differences in opinions about using anthropomorphic virtual characters for marketing purposes?

The second research question also relates to the definition of the target group for using anthropomorphic virtual characters for marketing purposes and to the opinions of potential consumers of different genders and generations. The study aims to answer the question of how different gender and age groups of recipients perceive different types of anthropomorphic virtual characters, taking into account the primary (gender) and secondary (age, weight, and skin texture) variables of the characters.

> Q2 = What are the opinions of the different generations and genders about the examined anthropomorphic virtual character types?

For marketing purposes, it is also important to know how potential consumers of different ages and genders perceive anthropomorphic virtual characters for a given type of product or service. This can determine the areas in which anthropomorphic virtual characters should be used for marketing purposes in the future. The research examines product and service categories based on *the Standard Industrial Classification of Economic Activities*.

> Q3 = What are the opinions of the different generations and genders on the use of anthropomorphic virtual characters for marketing purposes for a given category of products and services?

The fourth question of the doctoral dissertation is based on the fact that previous research has shown that anthropomorphic virtual characters for marketing purposes mostly elicit negative emotional reactions from recipients (Arsenyan & Mirowska, 2021). The negative recipient reaction may be due to an over-idealized appearance that the recipient perceives as unattainable (Horváth & Mezriczky, 2021) or even to an uncanny valley feeling caused by an overly realistic representation (Tinwell et al., 2011).

> Q4 = What is the proportion of negative receptive attitudes towards the use of anthropomorphic virtual characters for marketing purposes compared to positive attitudes?

Although body positivity movements have gained attention in recent years, the modern social ideal of beauty tends to favor a thinner body, and this is reflected in the social media representation of different body types, where a thicker body is much less frequently featured in marketing content (e.g., Wolfe, 2022; Lazuka et al., 2020). Hoffmann and Warschburger's 2019 study shows that the thinner body ideal is also dominant for men, complemented by expectations of gendered characteristics such as the appearance of muscle tone (Bassett-Gunter,

McEwan, & Kamarhie, 2017). The appearance of anthropomorphic virtual characters influenced by social media platforms is also aligned with the thinner body ideal by their creators. Based on the above considerations, subjects are expected to have more positive opinions of anthropomorphic virtual characters with thinner body shapes, as they are closer to the social ideal of beauty conveyed by the media.

Q5 = How do recipients perceive thinner anthropomorphic virtual characters compared to thicker ones?

Among the different facial features, eyes play a prominent role in inducing the uncanny valley phenomenon, i.e., the eerie feeling of anthropomorphic virtual characters (Seyama & Nagayama, 2007). The glints of light due to the wetness and convexity of the eyes, as well as the fine wrinkles around the eyes, are extremely difficult to model realistically (Bouwer & Human, 2017), and the gaze of virtual characters can often appear lifeless and "glassy" to the viewers. At the same time, other facial elements, such as facial skin or the mouth, can be rendered more lifelike on the characters so that the less realistic eye can appear alien to the virtual face. This discrepancy may elicit the recipient's negative emotional response (uncanny valley) (MacDorman et al., 2009).

Q6 = Which facial features of anthropomorphic virtual characters seem the least realistic to the audience?

How skin is represented can also significantly impact the recipient's perception of anthropomorphic virtual characters. Realistic, textured skin rendering enhances the lifelike nature of the characters and thus has the potential to change the recipient's attitude towards anthropomorphic virtual characters in a positive direction (MacDorman et al., 2009).

Q7 = What are the audience's opinions about anthropomorphic virtual characters with realistically textured skin?

Research has shown (Hofeditz et al., 2022; Batista & Chimenti, 2021) that anthropomorphic virtual characters have lower perceived credibility compared to real influencers. Since perceived credibility is closely related to the perceived trust in the agent, it can be said that perceivers trust an anthropomorphic virtual character less than a real person (Batista & Chimenti, 2021). According to the research of Choudhry et al. (2022), only a few areas are exceptions to this: technology, music, computer games, and visual arts. Low perceived credibility and lack of trust may also influence the use of anthropomorphic virtual characters

for marketing purposes: service categories where consumers place a high value on the source's credibility and the existence of trust may be less likely to accept the use of anthropomorphic virtual characters for marketing purposes. On the other hand, for product categories where the virtuality of the character is precisely for credibility, such as technology-related product and service categories, the use of anthropomorphic virtual characters may become more acceptable. Virtual characters, created with outstanding professionalism and precision as a novel marketing tool, can underpin the high quality of the presented product or service.

> Q8 = What is the type of product or service for which anthropomorphic virtual characters are most accepted for marketing purposes?

Based on the above, the dissertation thus opens up new directions for the scientific study of anthropomorphic virtual characters for marketing purposes, with special regard to the characters' physical appearance and the reasons for the reactions and opinions of the recipients.

II. The methods used

The primary research method of the dissertation is the focus group interview, which aims to explore the attitudes and opinions of Generation Z and Y viewers towards anthropomorphic virtual characters to investigate the impact of virtual characters from the perspective of the lay audience. The interviewees were selected based on a screening questionnaire: 21 people were chosen for the sample, consisting of two Generation Z and two Generation Y groups. For all four groups, the focus group interviews were based on a gallery of images of anthropomorphic virtual characters of different genders, ages, weights, and skin textures. In each case, the variables were displayed on the faces of the virtual characters, as the present research does not aim to investigate the whole body composition of the virtual characters. The interviewees' responses were based on the presented visual material.

The focus group interviews were complemented by an online survey distributed in Hungarian and English, which aimed to validate the impressions and different characteristics that the interviewees associated with the virtual characters presented. The central part of the survey is composed of images depicting different virtual characters about which the focus group participants had previously indicated that they would like to see them in marketing content in a particular product or service category: this represented a total of 6 character types. After viewing the images, respondents were asked to rank the character according to different value pairs: the value pairs were based on the variables and characteristics that the focus group

interview subjects had identified before the online survey. In each case, the value pairs were opposite of each other and were placed at two ends of a seven-point scale within three broad categories: realism, appearance, and impressions. After data cleaning, the questionnaire sample consists of 165 respondents.

III. Scientific results of the dissertation

Based on the results of the research, Generation Y recipients tend to show more negative attitudes towards anthropomorphic virtual characters and their use for marketing purposes, while Generation Z participants are more likely to show acceptance and direct disapproval. Nevertheless, Generation Z participants are the ones who are more concerned about the potentially harmful effects of using virtual characters for marketing purposes, such as over-idealized appearance, which can have a negative impact on people's self-image. The latter was previously confirmed by the research results of Ji, Linghu, and Qiao (2022); however, a year later, Deng and Jiang (2023) just concluded that the idealistic image conveyed by virtual characters is much less harmful to human self-esteem than digitally edited, idealized photos of real people. Attitudes towards the use of anthropomorphic virtual characters for marketing purposes are also influenced by whether, in general, the recipient is more technologically optimistic or pessimistic. Techno-optimistic viewers are more likely to express acceptance or liking and less likely to express negative attitudes such as dislike, rejection, or fear. Expressions of fear occurred in all but one case in groups viewing a male virtual character. They mainly were related to the character's erratic emotional state or lifeless-looking facial features. These problems have been addressed in research by Tinwell et al. (2011, 2013), MacDorman et al. (2009), and MacDorman and Ishiguro (2006), among others, concerning the emotional display of virtual characters and the uncanny valley phenomenon.

According to the survey, respondents show mostly negative attitudes toward the use of anthropomorphic virtual characters for marketing purposes. In contrast, the results of the focus group survey show that a significant part of the respondents have a positive attitude towards the phenomenon: they consider it novel, engaging, and attention-grabbing, and most of them reject it only in a specific product category, rather than in general, for the whole phenomenon. The research results align with the findings of Sobchack (2014) and Saunders (2019), who see the success of virtual imaging technologies, among other things, in the sense of freedom they offer. Another benefit that emerged from the focus group discussions was the high degree of control that contracting brands have over anthropomorphic virtual characters. Drenten and Brooks

(2020) and de Brito Silva et al. (2022) highlighted the ability to control without human risk in their papers on virtual influencers. The benefits listed by the interviewees about the use of virtual characters for marketing purposes can be grouped into three main categories: innovation, economy, and social utility.

The research also examines the use of virtual characters for marketing purposes in three market segments: fashion and beauty, electronics, and art products and services. The results show that anthropomorphic virtual characters are most likely to be welcomed in the marketing content of products and services with a technological connection because, in this case, virtual characters as technology products are perceived as a credible source for consumers. Those who reject the use of virtual characters in a particular market segment mostly complain about the lack of human values and the lack of trust in an anthropomorphic non-human agent. Therefore, a virtual character is unable to encourage them to buy the advertised product. Bokor, Ságvári, and Kollányi (2022) also refer to the impact of trust on the receptive attitude of users in relation to their perception of the achievements of new media technology.

Recipients tend to anthropomorphize virtual characters, i.e., to endow them with human characteristics, such as emotional or other states and personality traits, sometimes by associating fictional life stories with them. The results confirm the research findings of Leyens et al. (2003) and Epley et al. (2007), who argue that the tendency to anthropomorphize is an innate human trait and that it is an integral part of the endowment of non-human agents with different emotional or other states, motivations, and intentions. Research shows that the need for anthropomorphizing is more pronounced in Generation Y recipients and more pronounced in women when gender differences are considered.

Among the virtual character types, both male and female characters had the most positive reception when depicted as young, thin, and with realistically textured skin, based on the results of both research methods. Generation Y participants in all market segments would prefer to see this character type in marketing content, and these character types were also the most preferred in Generation Z groups.

Skin has the most significant impact on the recipients' attitudes regarding the variables that affect the appearance of anthropomorphic virtual characters: characters with smooth skin texture are perceived as artificial and lack humanity, resulting in a more negative attitude towards the character. The problem of combining realistic and unrealistic facial elements or body parts was also pointed out by Schwind, Wolf, and Henze in 2018, highlighting that such

inconsistencies trigger the uncanny valley effect for a significant part of the audience. This was also confirmed by the research of Cornelius, Leidner, and Bina (2023), who found that imperfect realism leads to more negative receptive attitudes than entirely realistic or unrealistic representations.

The realistic representation of skin, skin imperfections, wrinkles, and hairs is seen as a positive aspect by interviewees, who believe that textured skin can help to make a virtual character less idealistic, and this can help viewers to identify with the character more easily in marketing content. The survey participants also showed more positive reactions to characters whose skin was textured. These findings confirm the results of authors who have researched the uncanny valley phenomenon (e.g., Misselhorn, 2009; Seyama & Nagayama, 2007; Tinwell et al., 2011, 2013; Mori, MacDorman & Kageki, 2012; Chattopadhyay & MacDorman, 2016) which claims that increasing realism shifts the audience attitudes in a positive direction.

Skin texture is also closely linked to age variables, as it could be used to show the "passage of time" of virtual characters beyond the grey hair color. The interviewees typically perceived the older character variations as the most realistic, which can also be explained by the skin texture because of the highly detailed representation of age wrinkles. They dislike, however, when the representation of older age is inconsistent on the character's face, and only the hair and skin show signs of aging. At the same time, there is minimal change in the character's eyes or other facial features. This is inconsistent with real human aging processes and makes it difficult for the recipient to age-classify virtual characters. From the viewer's point of view, a realistic representation of age is, therefore, an expected aspect. For the survey respondents, older character types tended to evoke more negative attitudes than young ones.

The third variable, weight, was a surprise for the recipients in the case of virtual characters with higher body weight: they said that they had previously only encountered thin anthropomorphic virtual characters. Shin and Lee find the same in their study published in 2023, which shows that virtual characters are created in the light of modern body ideals in most cases. The issue of body weight is the most prevalent among Generation Z participants, who, in almost all cases, made euphemistic references to body weight in their comments, which, like the association of states and character traits, also confirms the process of anthropomorphizing. A further correlation with body weight is that almost all the comments on it were made in groups viewing female character versions, with body weight being a less prominent aspect for the recipients seeing male character versions. In the online survey, the male version of the thick character type was presented, and its higher body weight had a negative impact on the results for only one

value, the perception of beauty: respondents perceived the thick character type as less beautiful than its thin version.

The need for realism was also present in the depiction of the eyes, in addition to the texture of the skin. In both studies, participants perceived the eyes of the virtual characters as static and lifeless, which triggered negative reactions. The comments and discomfort expressed by the interviewees can be traced back to the uncanny valley phenomenon and confirm the findings of MacDorman and Ishiguro (2006) and MacDorman et al. (2009) that the physical features of anthropomorphic non-human agents that are not depicted in a sufficiently lifelike way can evoke images of death in the recipients.

The main findings of the research are that attributes such as gender, generational classification, or technological attitude influence the perception of the use of anthropomorphic virtual characters, as well as the gender and other variables (age, weight, skin texture) of the characters. Therefore, these characteristics should be considered when designing a marketing campaign featuring anthropomorphic virtual characters. The most realistic representation is desirable for the recipient, as a lifelike representation leads to a positive change of attitude. Realism also requires that human features such as skin imperfections and small, elaborate details such as the veins in the eyes are visible on the character: this can counteract the problem of over-idealized, artificial appearances that viewers may find problematic. Consistency of representation is also important: if most facial elements of a virtual character are realistic, all other facial elements should follow a lifelike representation to avoid the uncanny valley effect. In terms of external characteristics, the character type most appealing to the audience is the young, thin, and textured-skinned character types. In general, virtual characters are most popular in marketing content if the product or service being promoted is considered to be technology-related in some way so that virtual characters can be perceived as a credible source.

IV. Main references

Abbott, S. (2006). Final Frontiers: Computer-Generated Imagery and the Science Fiction Film. *Science Fiction Studies*, *33*(1), 89–108.

Ahn, R. J., Cho, S. Y., & Sunny Tsai, W. (2022). Demystifying computer-generated imagery (CGI) influencers: The effect of perceived anthropomorphism and social presence on brand outcomes. *Journal of interactive advertising*, *22*(3), 327–335. DOI: https://doi.org/10.1080/15252019.2022.2111242.

Arsenyan, J. & Mirowska, A. (2021). Almost human? A comparative case study on the social media presence of virtual influencers. *International Journal of Human-Computer Studies*, *155*, 102694. DOI: https://doi.org/10.1016/j.ijhcs.2021.102694.

Baklanov, N. (2019). *The Top Instagram Virtual Influencers in 2019*. Letöltve: https://hypeauditor.com/blog/the-top-instagram-virtual-influencers-in-2019/#er [2024. február 11.]

Bassett-Gunter, R., McEwan, D. & Kamarhie, A. (2017). Physical activity and body image among men and boys: A meta-analysis. *Body image*, *22*, 114–128. DOI: https://doi.org/10.1016/j.bodyim.2017.06.007.

Batista, A. & Chimenti, P. (2021). "Humanized Robots": A Proposition of Categories to Understand Virtual Influencers. *Australasian Journal of Information Systems*, *25*, 1–27. DOI: https://doi.org/10.3127/ajis.v25i0.3223.

Baumgarth, C., Kirkby, A. & Kaibel, C. (2021). When fake becomes real: The innovative case of artificial influencers. In: Eleonora Pantano (eds.). *Creativity and marketing: The fuel for success* (pp. 149–167). Bingley: Emerald Publishing. DOI: .https://doi.org/10.1108/978-1-80071-330-720211010.

Bokor, T., Ságvári, B. & Kollányi, B. (2022). „Mi és az MI – Mesterséges intelligenciával kapcsolatos társadalmi attitűdök Magyarországon." [We and AI – Social attitudes towards artificial intelligence in Hungary.] Research report. Budapest: Társadalomtudományi Kutatóközpont.

Bouwer, W. & Human, F. (2017). The impact of the uncanny valley effect on the perception of animated three-dimensional humanlike characters. *The Computer Games Journal*, *6*, 185–203. DOI: https://doi.org/10.1007/s40869-017-0041-8.

Chattopadhyay, D. & MacDorman, K. F. (2016). Familiar faces rendered strange: Why inconsistent realism drives characters into the uncanny valley, *Journal of Vision*, *16*(11), 7–7. DOI: https://doi.org/10.1167/16.11.7.

Chen, K. J. (2017). Humanizing brands: an examination of the psychological process of anthropomorphism and its effects on consumer responses. *Journal of Marketing Management*, *5*(2), 75–87.

Cho, S. Y. (2023). *Understanding Computer-Generated Imagery (CGI) Influencers: A Mixed Method Cross-Cultural Comparison of the US and South Korea*. Doctoral dissertation. Miami: University of Miami.

Choudhry, A., Han, J., Xu, X. & Huang, Y. (2022). "I Felt a Little Crazy Following a "Doll" Investigating Real Influence of Virtual Influencers on Their Followers. *Proceedings of*

the *ACM on Human-Computer Interaction*, *6*, 1–28. DOI: https://doi.org/10.1145/3492862.

Cohen, R. J. (2014). Brand personification: Introduction and overview. *Psychology & Marketing*, *31*(1), 1–30. DOI: https://doi.org/10.1002/mar.20671.

Cornelius, S., Leidner, D. & Bina, S. (2023). Significance of Visual Realism–Eeriness, Credibility, and Persuasiveness of Virtual Influencers. In: Tung X. Bui (eds.). *Proceedings of the 56th Hawaii International Conference on System Sciences* (pp. 3421–3430). Honolulu: HICSS Conference Office.

De Brito Silva, M. J., De Oliveira Ramos Delfino, L., Alves Cerqueira, K. & De Oliveira Campos, P. (2022). Avatar marketing: a study on the engagement and authenticity of virtual influencers on Instagram. *Social Network Analysis and Mining*, *12*(130), 1–19. DOI: https://doi.org/10.1007/s13278-022-00966-w.

Deng, F. & Jiang, X. (2023). Effects of human versus virtual human influencers on the appearance anxiety of social media users. *Journal of Retailing and Consumer Services*, *71*, 103233. DOI: https://doi.org/10.1016/j.jretconser.2022.103233.

Drenten, J. & Brooks, G. (2020). Celebrity 2.0: Lil Miquela and the rise of a virtual star system. *Feminist Media Studies*, *20*(8), 1319–1323. DOI: 10.1080/14680777.2020.1830927.

Epley, N., Waytz, A. & Cacioppo, J. T. (2007). On Seeing Human: A Three-Factor Theory of Anthropomorphism. *Psychological Review*, *114*(4), 864–86. DOI: https://doi.org/10.1037/0033-295X.114.4.864.

Guthrie, S. E. (1995). *Faces in the Clouds: A New Theory of Religion*. New York: Oxford University Press.

Hofeditz, L., Nissen, A., Schütte, R., & Mirbabaie, M. (2022). Trust Me, I'm an Influencer! A Comparison of Perceived Trust in Human and Virtual Influencers. *ECIS 2022 Research-in-Progress Papers*, *27*, 1–12.

Hoffmann, S. & Warschburger, P. (2019). Prospective relations among internalization of beauty ideals, body image concerns, and body change behaviors: Considering thinness and muscularity. *Body Image*, *28*, 159–167. DOI: https://doi.org/10.1016/j.bodyim.2019.01.011.

Horváth, E. & Mezriczky, M. (2021). Új valóság születik. A CGI és a deepfake lehetőségei és veszélyei a médiatudatosság tükrében. [A new reality is born. The possibilities and dangers of CGI and deepfake in the light of media awareness]. *Magyaróra.*, *3*(1), 35–40.

Ji, Q., Linghu, L. & Qiao, F. (2022). The Beauty Myth of Virtual Influencers: A Reflection of Real-World Female Body Image Stereotypes. In: A. Luqman; Q. Y. Zhang & W. Liu (szerk.). *2022 3rd International Conference on Mental Health, Education and Human Development (MHEHD 2022)* (pp. 784–787). Amsterdam: Atlantis Press. DOI: 10.2991/assehr.k.220704.142.

Lazuka, R. F., Wick, M. R., Keel, P. K., & Harriger, J. A. (2020). Are we there yet? Progress in depicting diverse images of beauty in Instagram's body positivity movement. *Body image*, *34*, 85–93. DOI: https://doi.org/10.1016/j.bodyim.2020.05.001.

Leyens, J. P., Cortes, B. P., Demoulin, S., Dovidio, J., Fiske, S. T., Gaunt, Paladino, M. P., Rodriguez-Perez, A., Rodriguez-Torres, R. & Vaes, J. (2003). Emotional prejudice, essentialism, and nationalism. *European Journal of Social Psychology*, *33*, 703–717. DOI: https://doi.org/10.1002/ejsp.170.

MacDorman K. F. & Ishiguro H. (2006). The uncanny advantage of using androids in cognitive and social science research. *Interaction Studies: Social Behaviour and Communication in Biological and Artificial Systems*, *7*, 297–337. DOI: 10.1075/is.7.3.03mac.

MacDorman K. F., Green R. D., Ho C.C. & Koch C. T. (2009). Too real for comfort? Uncanny responses to computer generated faces. *Computers in Human Behavior*, *25*, 695–710. DOI: 10.1016/j.chb.2008.12.026

McDermott, L., Stead, M. & Hastings, G. (2005). What is and what is not social marketing: the challenge of reviewing the evidence. *Journal of marketing Management*, *21*(5–6), 545–553. DOI: https://doi.org/10.1362/0267257054307408.

Misselhorn, C. (2009). Empathy with Inanimate Objects and the Uncanny Valley. *Minds and Machines*, *19*(3), 345–359. DOI: 10.1007/s11023-009-9158-2.

Sands, S., Ferraro, C., Demsar, V. & Chandler, G. (2022). False idols: Unpacking the opportunities and challenges of falsity in the context of virtual influencers. *Business Horizons*, *65*, 777–788. DOI: https://doi.org/10.1016/j.bushor.2022.08.002.

Saunders, R. (2019). Computer-generated pornography and convergence: Animation and algorithms as new digital desire. *Convergence*, *25*(2), 241–259. DOI: https://doi.org/10.1177/1354856519833591.

Schwind, V., Wolf, K. & Henze, N. (2018). Avoiding the uncanny valley in virtual character design. *Interactions*, *25*(5), 45–49. DOI: https://doi.org/10.1145/3236673.

Seyama, J. & Nagayama, R. S. (2007). The uncanny valley: effect of realism on the impression of artificial human faces. *Presence: Teleoperators and Virtual Environments*, *16*(4), 337–351. DOI: 10.1162/pres.16.4.337.

Seyama, J. & Nagayama, R. S. (2007). The uncanny valley: effect of realism on the impression of artificial human faces. *Presence: Teleoperators and Virtual Environments*, *16*(4), 337–351. DOI: 10.1162/pres.16.4.337.

Shin, Y. & Lee, S. (2023). Issues of virtual fashion influencers' reproduced bodies: a qualitative analysis based on body discourse. *Fashion and Textiles*, *10*(30), 1–26. DOI: https://doi.org/10.1186/s40691-023-00349-5.

Sobchack, V. (2014). Sci-Why?: On the Decline of a Film Genre in an Age of Technological Wizardry. *Science Fiction Studies*, *41*(2), 284–300. DOI: https://doi.org/10.5621/sciefictstud.41.2.0284.

Tinwell, A., Grimshaw, M., Nabi, D. A. & Williams, A (2011). Facial expression of emotion and perception of the Uncanny Valley in virtual characters. *Computers in Human Behavior*, *27*, 741–749. DOI: https://doi.org/10.1016/j.chb.2010.10.018.

Tinwell, A., Nabi, D. A. & Charlton, J. P. (2013). Perception of psychopathy and the Uncanny Valley in virtual characters. *Computers in Human Behavior*, *29*(4), 1617–1625. DOI: https://doi.org/10.1016/j.chb.2013.01.008.

Udvary, S. (2020). A non-humán ágensek (intelligens rendszerek) jogi szabályozása – robotok, dedikált rendszerek (önvezető autók). [Legal regulation of non-human agents (intelligent systems) - robots, dedicated systems (self-driving cars)]. In: Homicskó Árpád Olivér (szerk). *A digitalizáció hatása az egyes jogterületeken* (pp. 239–256). Budapest: Károli Gáspár Református Egyetem Állam- és Jogtudományi Kar.

Wibawa, R. C., Pratiwi, C. P., Wahyono, E., Hidayat, D. & Adiasari, W. (2022). Virtual influencers: is the persona trustworthy?. *Jurnal Manajemen Informatika (JAMIKA)*, *12*(1), 51–62. DOI: https://doi.org/10.34010/jamika.v12i1.6706.

Wolfe, W. L. (2022). Does Gratitude Induction Buffer the Adverse Effect of Thin Ideal Media Exposure on Women's Body Image?. *North American Journal of Psychology*, *24*(1), 7–26. DOI: 10.13140/RG.2.2.28387.68644

V. List of own publications on the topic

Horváth, Evelin (2024). MI-csoda szépség!: Nézői attitűdök a mesterséges intelligencia által manipulált arcokkal kapcsolatban. [What A(I) beauty! Viewer attitudes towards faces manipulated by artificial intelligence]. *Információs Társadalom: Társadalomtudományi Folyóirat*, *24*(1), 95–117.

Horváth, Evelin (2023). Hamisítható a szépség? A deepfake és a szépségideál kapcsolatának vizsgálata. [Can beauty be faked? – Exploring the relationship between deepfake and the ideal of beauty]. In: Aczél Petra & Veszelszki, Ágnes (eds.) *Deepfake: a valótlan valóság* (pp. 211–227). Budapest: Gondolat Kiadó.

Horváth, Evelin (2023). The participation of anthropomorphic virtual characters in social movements. In: Nazife Gümgör (eds.) *10th International Communication Days Digital Capitalism and Communication Symposium Abstracts Book* (pp. 146). Istanbul: Üsküdar University Faculty of Communication.

Horváth, Evelin (2022). „Ne felejtsétek el újratölteni a szíveteket!" – A történetmesélés és a karakteralkotás nyelvi jegyeinek vizsgálata egy virtuális influencer kisfilmjeiben. ["Don't forget to recharge your hearts!" – Exploring the linguistic features of story-telling and character creation in a virtual influencer's short films]. In: Ballagó Júlia, Havasi Zsuzsanna, Roskó Mira Rózsa (eds.) *Diskurzus, Jelentés, Rendszer. Tanulmányok a 16. Félúton konferenciáról* (pp. 33–53). Budapest: ELTE BTK.

Horváth, Evelin (2022). A virtuális influencerek térnyerése. [The rise of virtual influencers]. *Magyaróra. Mondat*, 4(2), 195–199.

Horváth, Evelin (2022). Antropomorf virtuális influencerek részvétele öt ismert társadalmi mozgalomban. [The participation of anthropomorphic virtual influencers in five well-known social movements]. *Jel-Kép*, 2022/3, 20□40.

Horváth, Evelin (2022). Camouflage – Exploring the AI-Generated Beauty Ideal. Etkileşim, 10, 100–121.

Horváth, Evelin (2022). Pixelekbe öntött érzelmek. A virtuális érzelemmegjelenítés vizsgálatának lehetőségei. [Pixelized emotions. Possibilities for investigating the virtual display of emotions]. *Századvég*, *2022*(1), 121–144.

Horváth, Evelin & Mezriczky, Marcell (2021). Új valóság születik. A CGI és a deepfake le-hetőségei és veszélyei a médiatudatosság tükrében. [A new reality is born. The possibilities and dangers of CGI and deepfake in the light of media awareness]. *Magyaróra, 3*(1), 35–40.

Horváth, Evelin (2021). A virtuális karakterek szerepe a társadalmi mozgalmakban. [The role of virtual characters in social movements]. In: Sándor, Cecília; Keszei, Flóra; Magosi, Orsolya; Veloso, Admilson (eds.) *KOMMenTÁR: Fiatal Kommunikációkutatók Találkozója: Absztraktfüzet* (pp. 59–62). Budapest: National Association of Doc-toral Students Department of Communication and Media Studies.

Horváth, Evelin (2021). Porból lettünk, pixellé leszünk. A CGI-modellek társadalmi és rek-lámipari hatásának vizsgálata az élőmodelles portré- és divatfotózással összehason-lítva. [All are of the dust and all turn to pixel. Examining the social and promotional impact of CGI models compared to human model portraiture and fashion photography]. In: Juhász Péter, Mitev Ariel, Wimmer Ágnes (eds.). *Közgáz diáktudós. Felelősség és közösség* (pp. 105–120). Budapest: Budapesti Corvinus Egyetem.

Horváth, Evelin (2020). Saját képünkre teremtve. Képesek-e a nézők megkülönböztetni a valódi és a virtuális fotómodelleket? [Made in our own image. Can viewers dis-tinguish between the real and the virtual photo models?] In: Szabó Csaba (eds.) *XXIII. Tavaszi Szél Tanulmánykötet* (pp. 205–214). Budapest: National Association of Doctoral Students.