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A Survey on Trust in Augmented Human Technologies

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Abstract. Human have used prosthetics for a long time, especially to recover lost abilities such as eye sight with glasses, but it seems there is an increasing trend towards augmenting the human beyond its capabilities. The poster presents the results of a survey carried out in April 2018 regarding the willingness of people to use brain implants to improve their memory.

Keywords: Human Factors · Human-systems Integration

1   Introduction

Humans have used prosthetics for a long time but it seems that there is an increasing trend towards augmenting the human not only to retrieve its abilities after being disabled but also beyond its normal abilities. For example, Elon Musk has recently created a new venture for "devices that can be implanted in the human brain, with the eventual purpose of helping human beings merge with software and keep pace with advancements in artificial intelligence" [1]. Intellectual jobs competition may be higher than in the past as it seems that more and more white collars tend to use drugs to improve their intellectual job performance [2]. Doping in sport with drugs is also not new [3] but the Superhuman Sports Society [4], which has been created in 2015, even works towards enhancing human sporting abilities with virtual reality and exoskeletons. The Augmented Human (AH) international conferences [5]–[9], which focus on scientific contributions towards augmenting human capabilities through technology for increased well-being, improvement of people daily life and enjoyable experiences, cover the different technologies that may be used to augment humans: augmented and mixed reality [10]; head-mounted displays and smart glasses [11]; wearable computing and smart textile [12]; Brain-Computer Interfaces (BCI) [13]; senses, muscle and implanted interfaces [14]; sensors; prosthesis, bionics and exoskeletons [15]; medicines, drugs and ingested nanorobots… The related trust issues [16]–[20] of these technologies, encompassing safety, ethics, privacy and security, are also discussed during these conferences. However, the different movements behind transhumanism [21], from philosophy to belief, are not meant to be discussed as part of these conferences. In the following section, we detail the results of a study carried out in April 2018 on the willingness of people to use brain implants to improve their memory, which will be presented as a poster during IHSED 2018.

2   Survey Results

In April 2018, the following question has been asked to users of the Google Survey online tool [22]: "Would you agree to have an implant in your brain in order to augment your abilities, for example, to improve your memory?"

Although there were 1153 respondents, weighting has been applied to the answers in order to remove bias from the survey sample and make the results more closely represent the target population, which was the USA, leading finally to 871 respondents.

"Fully disagree" is the stastically significant winning answer with 95% confidence. As shown on Fig. 1, a bit less than 50% fully disagree and a bit more of 10% fully agree.
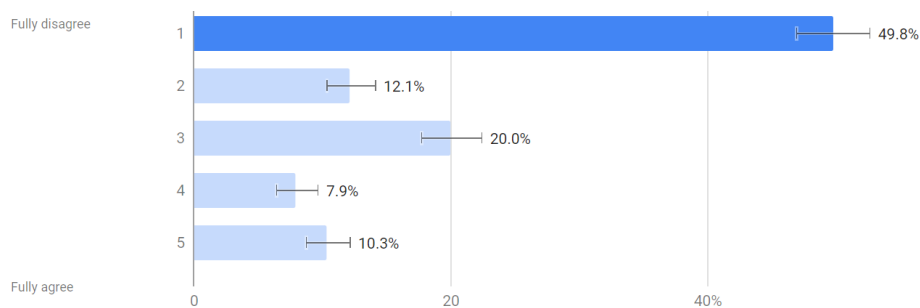

Fig. 1 Percentages of answers from "Fully Disagree" to "Fully Agree"

As it can be seen on Fig. 2 and Fig. 3, male respondents aged between 18 and 24 years old are on average slightly more open to brain augmentation.
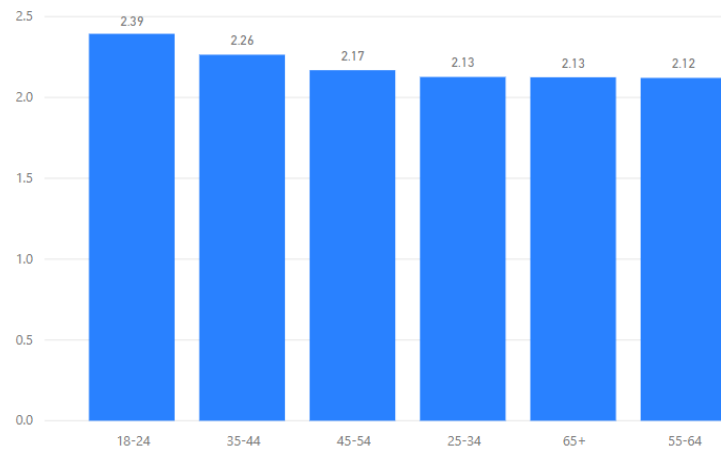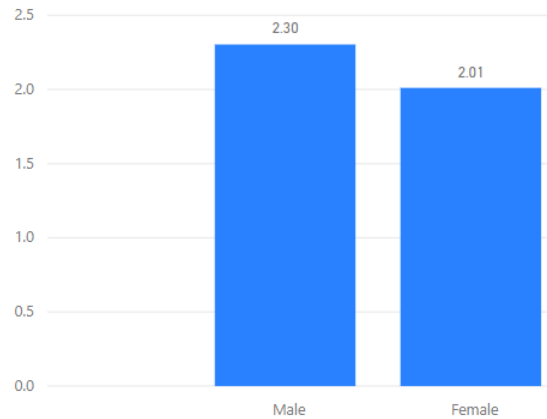

Fig. 2 Average Answer by Age

Fig. 3 Average Answer by Gender

Male respondents aged between 35 and 44 years old have the highest percentage of respondents fully agreeing with brain implant augmentation, i.e., 17.7%. Female respondents aged 65 years old and over have the lowest percentage of respondents fully agreeing with brain implant augmentation, i.e., 6.3%, in contrast to 15.2% for the male respondents of same age.

3   Conclusion

Our survey shows that in April 2018 in the USA around 10% of its population, especially young and old males, were open to be augmented with an implant in their brain.

References

[1]   N. Statt, "Elon Musk launches Neuralink, a venture to merge the human brain with AI," *The Verge*, 27-Mar-2017. [Online]. Available: https://www.theverge.com/2017/3/27/15077864/elon-musk-neuralink-brain-computer-interface-ai-cyborgs. [Accessed: 16-Apr-2018].

[2]   A. B. Brühl and B. J. Sahakian, "Drugs, games, and devices for enhancing cognition: implications for work and society," *Ann. N. Y. Acad. Sci.*, vol. 1369, no. 1, pp. 195–217, 2016.

[3]   A. D. Fraser, "Doping control from a global and national perspective," *Ther. Drug Monit.*, vol. 26, no. 2, pp. 171–174, 2004.

[4]   Y. Oka, "Superhuman Sports Society aims to bring Harry Potter's Quidditch, Dragon Ball to life," *The Japan Times Online*, 03-Jun-2015.

[5]   "Augmented Human International Conferences Series." [Online]. Available: http://www.augmented-human.com/. [Accessed: 26-Sep-2017].

[6]   H. Saito and J.-M. Seigneur, *AH '10: Proceedings of the 1st Augmented Human International Conference*. New York, NY, USA: ACM, 2010.

[7] J.-M. Seigneur, H. Koenitz, and G. Moreau, *AH '12: Proceedings of the 3rd Augmented Human International Conference*. New York, NY, USA: ACM, 2012.

[8] A. Schmidt *et al.*, *AH '16: Proceedings of the 7th Augmented Human International Conference 2016*. New York, NY, USA: ACM, 2016.

[9] J.-M. Seigneur, S. Nanayakkara, J. Paradiso, P. Mistry, and P. Maes, *AH '17: Proceedings of the 8th Augmented Human International Conference*. New York, NY, USA: ACM, 2017.

[10] D. Chatzopoulos, C. Bermejo, Z. Huang, and P. Hui, "Mobile Augmented Reality Survey: From Where We Are to Where We Go," *IEEE Access*, vol. 5, pp. 6917–6950, 2017.

[11] P. A. Rauschnabel, A. Brem, and Y. Ro, "Augmented reality smart glasses: definition, conceptual insights, and managerial importance," *Unpubl. Work. Pap. Univ. Mich.-Dearborn Coll. Bus.*, 2015.

[12] M. Stoppa and A. Chiolerio, "Wearable electronics and smart textiles: a critical review," *Sensors*, vol. 14, no. 7, pp. 11957–11992, 2014.

[13] A. E. Hassanien and A. A. Azar, "Brain-Computer Interfaces," *Switz. Springer*, 2015.

[14] M. Obrist *et al.*, "Touch, taste, & smell user interfaces: The future of multisensory HCI," in *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems*, 2016, pp. 3285–3292.

[15] W. Liu, B. Yin, and B. Yan, "A survey on the exoskeleton rehabilitation robot for the lower limbs," in *2nd International Conference on Control, Automation and Robotics (ICCAR)*, 2016, pp. 90–94.

[16] J.-M. Seigneur, "Trust, Security and Privacy in Global Computing," Trinity College Dublin, 2005.

[17] J.-M. Seigneur, "The emotional economy for the augmented human," in *Proceedings of the 2nd Augmented Human International Conference on - AH '11*, Tokyo, Japan, 2011, pp. 1–4.

[18] K. Fan, J.-M. Seigneur, S. Nanayakkara, and M. Inami, "Electrosmog Visualization through Augmented Blurry Vision," in *Proceedings of the 7th Augmented Human International Conference*, 2016, vol. ACM ICPS.

[19] J.-M. Seigneur, X. Titi, and T. El Maliki, "Towards mobile/wearable device electrosmog reduction through careful network selection," in *Proceedings of the 1st Augmented Human international Conference*, 2010, p. 21.

[20] J.-M. Seigneur, "Wi-Trust: Improving Wi-Fi Hotspots Trustworthiness with Computational Trust Management," presented at the ITU Kaleidoscope International Conference, 2015.

[21] F. Ferrando, "Posthumanism, transhumanism, antihumanism, metahumanism, and new materialisms," *Existenz*, vol. 8, no. 2, pp. 26–32, 2013.

[22] "Google Surveys - Your Surveys." [Online]. Available: https://surveys.google.com/your-surveys. [Accessed: 27-Jun-2018].