

CYBORG ACCEPTANCE IN HEALTHCARE SERVICES

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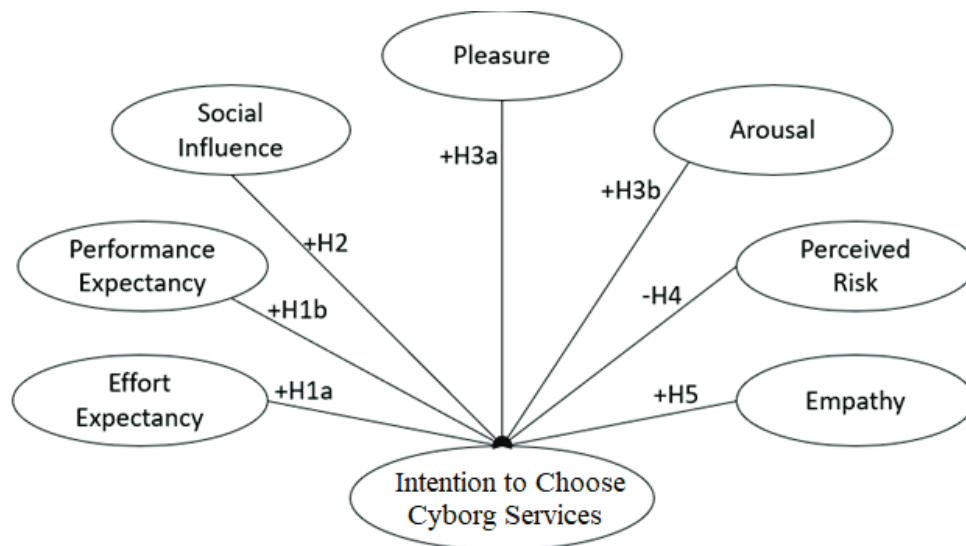
EXTENDED ABSTRACT

The emergence of the technological implants for therapy and improvement of human capabilities opens a new era in human-machine interaction. The term cyborg (Cybernetic Organism) is introducing the human with new capabilities, by using wearables or by implanting electronic devices into humans' body (Park, 2014). Most of the developed implantable devices across the past decade have been utilized for the healthcare applications, such as paralyzed limbs control, pacemakers, and cochlear (Raatikainen et al., 2015), and some of these devices are being used to enhance human capabilities, such as memory, vision, hearing, physical strength, and moral enhancement (Jotterand, 2014; Reinares-Lara, Olarte-Pascual, Pelegrin-borondo, & Pino, 2016). For instance, the cochlear implants represent the first interaction between human brain and machines to replace the lost sounds by allowing brain to recover the sense of hearing. Also, it could be used to enhance the hearing ability of healthy people (Christie & Bloustien, 2010). On the other hand, technological tattoos, fitness trackers, smartwatches, and smart glasses are representing some examples of wearables technology (Firger, 2015). This development requires to investigate customer behavior toward such technologies. In this sense, the use of technological implants in therapy application has been accepted by society and the use of them to improve human capabilities has been partially accepted. Further investigations are ongoing to be able to understand the factors that could stimulate the acceptance of such technologies (Pelegrín-Borondo, Arias-Oliva, Murata, & Souto-Romero, 2018). In parallel, once these entities (i.e. Cyborgs) become realistic and as proposed, how will humans perceive cyborg individuals in their society? Are they going to accept their existence? Are they going to interact with them normally? And propose that cyborg will become an employee in any service setting, are people willing to accept the services offered by cyborg? Could they prefer it over human services, for instance? Accordingly, the need is to investigate the factors that influence cyborg acceptance as an entity in society.

This research focuses on the factors that could impact cyborg acceptance in healthcare services. In particular, a model (Figure 1) was developed to investigate the intention to choose cyborg as a surgeon to correct a visual impairment in one eye. The model was developed based on previous theories and models that have been used to investigate acceptance of new technologies. The effort expectancy and performance expectancy have been introduced by the Unified Theory of Acceptance and Use of Technology (UTAUT1) for Venkatesh et al. (2003) and its extension UTAUT2 Venkatesh et al. (2012), and they have been used in studying acceptance of being cyborg by Cognitive-Affective-Normative Model (CAN) for Pelegrín-Borondo et al. (2016). In addition, the social influence, which has been introduced by the Theory of Reasoned Action (TRA) for Fishbein and Ajzen (1975) and the Theory of Planned Behavior (TPB) for Ajzen (1991), and used in acceptance of new technology, such as acceptance of Nanoimplants (Pelegrín-Borondo, Juaneda-Ayensa, González-Menorca, & González-Menorca, 2015; Pelegrín-Borondo, Reinares-Lara, & Olarte-Pascual, 2017; Pelegrín-Borondo et al., 2016; Reinares-Lara, Olarte-Pascual, & Pelegrín-Borondo, 2018; Reinares-Lara et al., 2016). Regarding emotional dimension, the research used pleasure and arousal. Pleasure is related to a person's state

of feeling of goodness, happiness, joyfulness, or contentedness in a certain situation. And, arousal is about a person's state of feeling with excitement, alert, stimulation, wakefulness, or activeness in a certain situation (Das, 2013; Mehrabian & Russell, 1974). Positive arousal and pleasure emotions can allow humans to feel with optimism while choosing their plans and goals. In fact, arousal could be seen as preparation toward actions (Russell, 2003). Furthermore, the perceived risk dimension has been used by Pelegrin-Borondo et al. (2017) while studying the acceptance of insideable technologies. In this context, when benefits exceed the risk that is associated with nanotechnologies, the perception of risk may decrease (Gupta, Fischer, & Frewer, 2015; Satterfield, Kandlikar, Beaudrie, Conti, & Harthorn, 2009). Finally, in technology acceptance context, such as human-robot interaction, humans can convey empathy by imitating the facial expression of the other party (Riek & Robinson, 2008). It could be proposed that this way of conveying empathy should be used in the human-cyborg interactions, since the perceived empathy has been found to be a significant determinant of the intention towards humanoid technologies (Homburg & Merkle, 2019).

Figure 1. The Proposed theoretical model



This research used a quantitative methodology, and the online survey was developed using Google Forms. The data were collected from 379 individuals from different Jordanian universities. A total of 53% of the respondents were men, and 47% were women. The PLS-SEM technique was used to test the proposed hypotheses. The proposed model's explanatory power was high ($R^2 = 0.77$). The results confirmed the impact of effort expectancy, performance expectancy, social influence, and arousal emotional dimension on the intention to choose cyborg services. In contrast, pleasure emotional dimension, empathy, and perceived risk were not found to have any significant impact on intention to choose the proposed cyborg surgeon.

This research opens a new line of researches related to the acceptance of cyborg technology as an entity. In this regard, studying the acceptance of cyborg technology will help the companies in promoting their related products (i.e. wearables and implants), and to understand the factors stimulating the acceptance of those products.

The study was conducted in a single country. The differences in culture could affect consumers' intentions toward cyborg technology. According to that, this research should be extended to different

countries for evaluating the impact of cultural differences on the intention to use the proposed services. In the same context, this research proposed a specific use of cyborg technology. The result could vary if the proposed use conducted in different service settings. Therefore, future research could apply this research model to different service settings.

KEYWORDS: Cyborg, Healthcare Services, Technology Acceptance, Intention to Choose.

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