

# Wearables as Social Technology for Cognitive Enhancement

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## Abstract

Understanding the quantified self is only the beginning of the potential for wearables until we have clarity on outcomes. Forbes Öste's research explores the social implications of increased awareness of self from the physiological to the psychosocial for the discreet wellness wearables user.

## Background

Presenting oneself with full awareness and intention is far more difficult than in sounds. Engaging with others without the disruption of judgments, distraction, egos not to mention ones own body getting in the way can be equally challenging. Engagement can be fruitful for all involved with a certain degree of reciprocity, awareness of self, empathy and attention to the moment. This is referred to as *social optimization* (Forbes Öste, 2013); the building and maintaining of mutually effective and beneficial relationships. In a demanding world where relationships, networks and engagement are crucial to survival and success, how we show up in the moment can define our futures.

Showing up in the moment, *optimal presence*: fully aware of and engaged with self and others, is often hindered. Technology is often used as the scapegoat for distraction. Addiction to social media and the devices themselves hinder presence (Clayton et al., 2015). Nonetheless one's physiological challenges and general wellness cannot be ignored as potential factors. Some of the most notable disruptions to attention are sleep, fitness, chronic pain, mood, focus, stress, and posture. Understanding potential interventions to remove the physical hindrances can open new opportunity for greater social optimization.

## Wellness Wearable Technology

The wearable technology (wearables) market has exploded in the recent years. The wearables market is currently dominated by smartwatches and fitness trackers. The initial

user-base consisted predominantly of early adopters in tech and those involved in the quantified-self movement. For the quantified-selfer it is a question of fine-tuning physical training through awareness of health and fitness sensors and smartphone applications (apps) for peak performance. Integrated into many of the apps are social tools for sharing and competing for points systems as incentive to reach certain goals. This is motivating for some, and demotivating for others who perhaps do not perform as well.

Corporate wellness programs have showed an increased interest in the use of wearables both for motivating increased activity and preventative health, but also for communication of wellness with caregivers. As to the outcomes for improved fitness, the evidence is predominantly anecdotal, but positive none-the-less. Adoption of wearables for in mainstream (beyond quantified health and the un-well) has shown a rapid increase. From the physical data, this will hopefully show improvement for the users and the systems in which they operate by increased activity alone.

The discussion thus far has been on the physiological outcomes of wearables use. With the wellness and digital health devices expanded beyond steps and heart rate, there are opportunities to look beyond physiological results. Wearables now bring our attention to sleep patterns, fitness and movement, chronic pain, mood, stress and posture. All the above are potential disruptions to attention and the ability to engage fully in the moment.

The category extension introduced many new players in the last year with a profound potential for reach beyond the tracking of steps and heartbeats. The area of digital health has exploded to include many players that come from both the medical device side and the tech "toys." The difference in some cases is willingness of the developers to wait for Food and Drug Administration (FDA) for medical classification versus Federal Trade Commission (FTC) launching a product to market. The advantage with the latter in the US market is reimbursement for health care.

Two examples are stress relief and pain management devices. One of these is the recent focus training devices using electroencephalogram (EEG) technology. Muse, an EEG band developed by Interaxon, a Toronto based com-

pany, provides solid neuroscience behind their product for stress reduction. Nonetheless, as a commercial product it is accessible through popular channels the likes of Amazon and Best Buy, without prescription of course. Another is the rise in pain management devices that are based on nerve stimulation, Transcutaneous Electrical Nerve Stimulation (TENS). Previously they were only available in pharmaceutical grade and too large to be worn discretely. BlueTENS, a Paris based company, launched a device which, like the Muse is controlled with a smartphone.

## Physiological to Psychosocial

There is no doubt that we experience the connection between getting a good night sleep or sitting upright and our ability to be attentive and “awake.”

In *Spark*, Ratey (2008) demonstrated the neurogenesis that occurs when we exercise through several studies. Not only did it stimulate growth of new neural connections, but also proved to be effective in countering the effects of ADD, depression, menopause and Alzheimer’s.

Depression, has many modes of display, but also can be profoundly countered by physical activities ranging from running to sexual arousal. The neurotransmitters Dopamine, serotonin, oxytocin and endorphins are associated with both exercise and happiness. Yamasue et al.(2012) presented the argument for oxytocin (OT) stimulating prosocial behavior, although an intranasal, the naturally occurring OT should be explored to have similar effects. Sufferers of Seasonal Effective Disorder can counter symptoms with sun, getting outside, physical activity and social interaction.

The impacts of posture can be analyzed from both the poor posture and pain related to it, and good posture and the ability to connect. The Alexander Method offers extensive training in this approach to counter both poor presence and physical debilitation. Posture can have the distraction affect on both self and other as poor posture can be perceived as negative body language. Poor posture can also result of back pain which can lead to additional distraction.

Despite the fact that we feel better after a good nights rest, getting adequate sleep is a widespread problem. Sleep and its association with the ability to thrive came to the forefront of the media via the popular journalist Arianna Huffington (2014). She worked extensively with the Harvard Sleep Lab to understand the impact of sleep deprivation and the consequences on her body and mind. Huffington evolved this to develop the thrive index used by Virgin Pulse, a corporate wellness program. Sleep tracking devices, or the functionality built into other wellness wearables, have increased awareness of both the quality and quantity of each night’s sleep. Sleep also has implications on depression.

Pain management, particularly for those who suffer from chronic pain is critical for their ability to function at work

and in life. Whether deriving from an illness, injury or psychological disorder, managing pain signifies an increased quality of life, relief and even happiness.

Stress management whether through breathing, movement or meditation has long proven effective. Kabat-Zinn (2007) developed the Mindfulness Based Stress Reduction (MBSR) method that successfully is used in countering both pain and stress related issues. Devices that measure breathing and heart-rate provide access to understanding the effect the efforts from yoga and other stress relief and mediation related activities.

## Conclusion

Further studies to expand the effect of using wearable devices that build awareness of physiological indicators and the correlations to changes in psychosocial behavior are needed. The benefits can both motivate the users and create a greater understanding of the mind-body connection and influences.

Apps that compile the data from wearables and make it both accessible on smartphones and sharable with health providers will provide a better picture of the physiological impact of wearables. Until the integration of the psychosocial data is integrated, understanding the impact of wearables on our wellness will be incomplete.

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