FITNESS, TECHNOLOGY & PSYCHOLOGY

How Pokémon Go and the Apple Watch encourage user health

BY KATHY H. NGUYEN

The evolution of humans, or Homo sapiens, which means "wise man" in Latin, has always come hand in hand with technological advancement. Technology has been the main method of providing convenience for otherwise arduous daily tasks. Ironically, however, recent technology has been used to promote the opposite: fitness. Technological innovations draw from the psychology behind motivation, competition, and reward to make fitness more appealing.

The game developing company Niantic invented a less sedentary form of entertainment: an augmented reality mobile game known as Pokemon Go. The game, free as an application on iPhone and Android devices, is based on the Pokémon franchise created by Nintendo in 1995. Users are required to leave their home and explore their surrounding environment to capture Pokemon superimposed on their smartphone maps.

A review by Wolters Kluwer Health, Inc. pointed out that "users [walk] more than usual to advance in the game" [1]. In order to collect items necessary to catch Pokemons, users must walk to specific locations called 'PokeStops,' often highly concentrated in inner metropolitan streets and neighborhoods. Their physical movement is tracked with the global positioning system (GPS) from their device. Pokemon Go also has a function that requires users to walk a certain distance to hatch Pokemon eggs. Programmed to detect the user's speed, only distance walked is considered to be valid, encouraging exercise. The game's reliance on walking inadvertently causes users to generate personal fitness regimens. With 65 million new users on the first week of the game's launch, the impact of this game is widespread [1].

The appeal of Pokemon Go relies heavily on the dopamine reward circuitry. The circuitry involves a neurotransmitter, a chemical released by neurons used to send signals to other nerve cells. The specific neurotransmitter in this case, dopamine, is involved with regulating motivation, reward, and addiction. The dopamine reward circuitry can be activated not only by direct actions on the self, but also by action on objects that are viewed as extensions of the self. The extension of self encompasses any item that is a form of identity and self-expression outside of an individual's mind. An individual forms an attachment with these extensions and perceive any damages to them as also "an injury to the self" [2]. In the case of Pokemon Go, the item of extension is a user's Pokemon collection. As the collection expands through taxonomic collecting a user will receive a feeling of gratification from the reward circuitry [3]. The reward circuitry is also activated through a build up of self-efficacy. Users are in control of their gaming experience, as he or she dictates when and where to play the game in their surrounding environment [3]. Moreover, by requiring the user to physically move around to play the game, the user becomes the character and the real world becomes the virtual reality. The more new locations a user explores, the higher the chances of discovering new Pokemon; the continuous experience of new things also activates the

circuitry. By playing into the user's psyche, Pokemon Go easily becomes an addicting game that indirectly motivates the users to stay active.

Technological innovation has also led to wearable fitness gadgets. In early September 2016 Apple ushered in the release of the Apple Watch Series 2, which contains more features that encourage exercise. For example, a built-in function measures blood flow in a user's wrist with green LED lights and light-sensitive photodiodes [4]. The green color of the LED lights is based on how blood flow from each heartbeat absorbs green light and reflects red light. Therefore, a faster heart rate and greater blood flow equates to higher green light absorption. By using rapid flashes of the LED lights and measuring green light absorption, the Apple Watch calculates the user's heart rate. Along with heart rate, the user's activity is measured by the distance traveled walking or running, and number of steps taken. The tracked measurements are then analyzed and sent to users. If an individual remains seated for an extraneous amount of time, his or her Apple Watch will serve as a coach by sending them a reminder. A sample message includes "Time to stand! Stand up and move a little for one minute." [5].

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The watch also motivates users through applications that simulate the dopamine reward system by promoting competition. A 1995 study investigating why people like competition concluded that there are various reasons: some perceive competition as an opportunity to improve their performance, some aim to win [6]. Apple Watch makes competition possible through the sharing feature. Activity sharing allows users to share and compare physical activities with friends and family [5]. Users can automatically receive and send push notifications of progress and, in turn, help each other stay motivated.

Furthermore, once users reach milestones or their personal goal, users are rewarded badges. Receiving a badge activates a user's reward pathway in the brain: the ventral tegmental area, the nucleus accumbens, and the prefrontal cortex [7]. Reward stimuli causes information to travel to the prefrontal cortex which then triggers a release of dopamine. Dopamine stimulates neurons through nerve impulses, causing the user to experience positive emotions such as gratification [8]. As users will want to repeatedly experience the positive emotions, the badges will serve as a positive reinforcement for exercise.

Influencing fitness is only one example of user focused technology. In fact, most technology heavily relies on psychology for widespread success. This underlying emphasis on psychology, if applied correctly, can potentially benefit users by motivating them to pursue a healthier lifestyle. Future possibilities include exercise in virtual reality simulations. For now, however, while technology can make exercise seem more appealing, individuals are responsible for their own fitness and health.

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