（様式１）

2019年度総合情報基盤センター研究開発報告書

2020年　05月　07日

	氏　　名	所　　属
研究代表者	Jonathan Shachter	語学教育研究センター
研究分担者	Jeffrey Stewart	元　語学教育研究センター
	大薗　修一	語学教育研究センター
研究課題	To design and build an original research web application which allows researchers to monitor language learning anxiety (LLA) in real time via a physiological measure.	
研究開発期間	2019年　05月　31日　～　2020年　03月　31日	

研究の概要

In the broader field of anxiety, researchers often use a combination of physiological and self-reported methodology. The most common physiological measurements involve cortisol (via saliva), heart rate (HR), blood pressure, skin conductance and in some cases muscle tension. Correlating self-reported assessments with a physiological measure, however, can be expensive for Language Learning (LL) anxiety researchers and may be obtrusive in classroom data collections. In previous empirical studies outside of LL anxiety, self-reported anxiety measurements were found to have a significant correlation with HR responses.

In recent years, personal fitness trackers such as Fitbit™ have made measurement of a user's HR more affordable for consumers. However, since these products are designed for personal use, it is difficult for researchers to aggregate results across multiple participants to compute averages by given points in time that coincide with stimuli introduced by researchers. Fortunately, Fitbit offers an Application Programming Interface (API) for researchers to create data collection systems and tools. A "web-API" is a set of protocols that allows one computer to request and extract information from another computer, over the web (via a gateway). Using this, it is possible to build a tool that can track heart rate data for multiple users simultaneously, permitting second language acquisition researchers to monitor and measure anxiety on a group level.

研究の成果

The Fitbit Data Collection System (FDCS) has been successfully tested to (1) collect participant HR data using the Fitbit 'smart watch' (via the FitBit Cloud), (2) automatically synchronize the HR data by 'start of test' time for each student, and (3) transfer the synchronized HR data to a secure database. From the researcher's database, data can be transferred into a statistical program of choice for analysis via Excel or csv file. Figure 1 shows the flow of data from the user's own heart beat through to the researcher's computer.

Figure 1. Data Flow

User heart beat => Fitbit Wristband = [Smartphone App] => Fitbit Cloud Account = [WebAPI] => Fitbit Data Collection System = Browser = > Researcher's Computer.

The Fitbit Data Collection System (FDCS) has the scope to provide an efficient and cost-effective method to objectively measure and track LL anxiety. In doing so, this will facilitate and further our understanding of the association between LL anxiety self-reports and how strongly this is related to people's heart rate responses in ecologically valid settings (i.e., classroom contexts).

以　上

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