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# What is Your Fitness Tracker Communicating?: Exploring Messages and Effects of Wearable Fitness Devices

Daniel St. Clair Kreitzberg, Stephanie L. Dailey,  
Teresa M. Vogt, Donald Robinson, & Yaguang Zhu

*Although studies have investigated how the technical features of wearable fitness trackers promote physical activity, we understand less about how communication surrounding such devices may contribute to their success. Addressing current opportunities for inquiry is important, as the popularity of fitness trackers and other wearable devices grows. Through interviews with 25 people wearing fitness devices, this study elucidates how and with whom people communicate fitness tracker messages and explains the effects of sociomaterial practice on interactions between wearable fitness device users. Our findings show the vital role of communication in sharing and encouraging physical activity.*

*Keywords:* Communication Messages; Physical Activity; Sociomaterial Perspective; Technology; Wearable Fitness Devices

According to the Center for Disease Control (2014), only about one in five adults currently meet recommended exercise levels, which is problematic since physical activity predicts of both physical and mental health outcomes (Penedo & Dahn, 2005; Warburton, Nicol, & Bredin, 2006). Seeking to motivate individuals' physical

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Daniel St. Clair Kreitzberg (MS, University of Texas at Austin, 2015) is a doctoral student in Kinesiology and Health Education in the College of Education at the University of Texas at Austin, Austin, TX 78712. E-mail: [kreitzberg\\_dan@hotmail.com](mailto:kreitzberg_dan@hotmail.com). Stephanie L. Dailey (PhD, University of Texas at Austin, 2014) is an Assistant Professor in Communication Studies at Texas State University, San Marcos, TX 78666. E-mail: [dailey@txstate.edu](mailto:dailey@txstate.edu). Teresa M. Vogt (MEd, University of Texas, 2016) is a graduate of Kinesiology and Health Education at the University of Texas at Austin, Austin, TX 78712. E-mail: [tvogt@utexas.edu](mailto:tvogt@utexas.edu). Donald Robinson (MEd, University of Texas, 2016) is a graduate of Kinesiology and Health Education at the University of Texas at Austin, Austin, TX 78712. E-mail: [donald.robinson@utexas.edu](mailto:donald.robinson@utexas.edu). Yaguang Zhu (MA, University of Texas at Austin, 2014) is a doctoral student in Communication Studies at the University of Texas at Austin, Austin, TX 78712. E-mail: [yaguang.zhu@utexas.edu](mailto:yaguang.zhu@utexas.edu)

activity, wearable fitness device technologies, such as the Fitbit, Jawbone, and Apple Watch, allow users to measure, visualize, and share their physical activity throughout the day. These devices, which allow people the ability to track their steps, monitor their heart rate, and estimate caloric burn (Stables, 2015), are becoming commonplace tools for self-monitoring and quantifying physical activity. According to Statt (2015), 70 million devices were sold globally in 2014, and revenue from fitness trackers sold in the United States are projected to reach \$1.8 billion in 2015 (Hubbard, 2015). With the widespread adoption of wearable fitness technologies, research has begun to investigate how these devices influence physical activity and positive health outcomes.

Technology-based weight loss interventions have similar results to in-person behavioral change interventions, even producing greater adherence rates (Pellegrini, Verba, Otto, Hessel, Davis, & Jakicic, 2012). Furthermore, wearable fitness devices have been shown to effectively decrease body weight and waist circumference through self-monitoring (Barwais, Cuddihy, & Tomson, 2013; Shuger, Barry, Sui, McClain, Hand, Wilcox, & Blair, 2011). Although studies like these have demonstrated how fitness trackers—and the physical features they offer—can lead to positive health outcomes, we know little about the *communicative components* of such devices that influence physical activity.

### *Communication's Role in Wearable Fitness Devices*

Wearable fitness devices have several socially embedded features that may help increase physical activity. Whereas early fitness trackers, called “accelerometers,” used to simply tell users the number of steps completed or calories burned, today’s trackers now allow users to share their health data with others online. These new communicative components of wearable fitness devices likely influence users’ health behaviors. Indeed, Swan (2012) has argued that many technologies that collect and visually display users’ data, such as smart watches, monitoring patches, and home automation devices, impel meaning-making and action-taking. In other words, it is not only the technical capabilities of these technologies but the social layer allowing people to share data with others which enables sense-making and behavioral change. However, few studies have empirically explored the role of communication to understand how fitness trackers promote well-being.

Recently, Fritz, Huang, Murphy, and Zimmermann (2014) qualitatively explored how wearable trackers influenced participants’ health and motivation. The authors contended that fitness trackers are persuasive technologies that work through both explicit and implicit features (i.e., notifications), goals and achievements, and social interactions and sharing data to influence physical activity among users. In their analysis, the authors found that half of participants used the social features of their devices, but participants had difficulty “finding the right community” to share their data. The authors called for the “aspects of social use [to] be more fully addressed” (p. 496). To address this opportunity for inquiry, we investigate how people use their devices’ social features and explore the consequences of this communication. Moreover, we examine the use of wearable fitness devices in accord with sociomaterial theory.

According to sociomateriality, contemporary modes of organization are influenced by a multitude of burgeoning, evolving, and interdependent technologies (Orlikowski, 2007). Social and material technologies are fundamentally intertwined; thus, it is impossible to have one rather than the other, a concept termed *constitutive entanglement* (Orlikowski, 2007). With regard to fitness tracking devices, the programmed, material features of a given device shape users' social behaviors and organization. Furthermore, the sharing features of wearable fitness devices reflect social behaviors of persons. For example, sharing fitness information with peers that was once done verbally may now be conveyed through the click of a button. This communication process allows for individuals to share their fitness behavior in terms of data, despite distances, language barriers, and time of day. According to Orlikowski (2007), communication changes become relevant when activities like sending and receiving messages and repeatedly checking devices become intertwined with interpretations and interests. When users consistently receive messages pertaining to peer physical fitness, their social behaviors are likely to change.

In sum, although we know a great deal about the technical features of wearable devices, scholars still lack an understanding of communication practices surrounding the social features of fitness trackers. Although wearable devices are sociomaterial technologies, scholarship has separated the material and the social, only examining the physical features of fitness trackers (Barwais et al., 2013; Shuger et al., 2011). To address current opportunities for inquiry, the study explores a practice-oriented understanding of the recursive interaction between people, technologies, and social action (Orlikowski, 2000). Specifically, we ask:

RQ1: How and with whom do people communicate fitness tracker messages?

RQ2: How do fitness trackers, as a sociomaterial practice, shape interaction between users?

## Method

### *Participants*

To answer these questions, we recruited participants from a popular city park in a large southwestern city. After gaining approval from the Institutional Review Board, the authors visited the park on the weekends, the park's busiest time, and solicited participants for brief interviews. Researchers approached people who wore wearable fitness devices on their wrists. In exchange for their time, researchers gave participants a \$10 Amazon gift card.

In total, 11 male (44%) and 14 female (56%) adults took part in the study. Participants ranged in age from their early 20s to 60 years old, with an average age of 35 years old. This broad age range and a relatively even amount of males and females allowed us to explore a variety of social experiences of people using wearable fitness devices. Names and any identifying information have been changed for confidentiality.

### *Data Collection and Analysis*

Face-to-face interviews were conducted in a city park. The interview protocol included semi-structured questions (Kvale, 1996) that called upon respondents to express their attitudes about their use and communication surrounding wearable fitness trackers. During the interviews, questions remained flexible for probes and related tangents were explored (Charmaz, 2006). Interviews lasted between 5 and 20 minutes (depending on how much time participants were willing to dedicate to answering questions during their rest breaks), were audiotaped, and were transcribed by four of the researchers.

Data were analyzed using an iterative approach (Tracy, 2012). First, data were assigned to initial emergent categories using the constant comparative method. Here, we looked for similarities and differences in the data, grouped statements together to form categories, and labeled each code (Corbin & Strauss, 2008). Following open coding, initial categories were integrated through axial coding (Glaser & Strauss, 1967). Connections among codes were identified and categories were collapsed into broader themes, which are described next.

## **Results**

Data analysis revealed that participants communicated data from wearable fitness devices through face-to-face communication, traditional technologies, and social media. In addition, interviewees described several effects of the communication surrounding their fitness trackers. We explain these findings in greater detail below.

### *Communicating Fitness Messages*

Participants communicated their fitness data in three main ways: (a) face-to-face sharing, (b) sharing via traditional technologies (e.g., text messaging, sending photos, etc.), and (c) sharing via social media. We begin by discussing the most basic form of communicating fitness messages and then move to more complex interactions participants had with their devices and other users.

First, people shared fitness messages or results from their trackers through direct conversations with others. For example, Alyssa mentioned she does not talk about her fitness tracker "...unless I'm approached. The other day at the gym, these two girls asked me how I keep so skinny." To some extent, this communication mirrors how people share health information without wearable devices; however, with fitness data from their trackers, people have a visual representation or "proof" of their workout to corroborate their face-to-face messages.

Second, participants communicated health information through traditional technologies, which we define as any technology, aside from social media, that facilitates interaction among people, such as phone calls and text messages (Stephens, 2007). Participants mentioned sending others "screen shots" of their data via text message to share their fitness information. In addition, Dominique

mentioned how she learns about friends' health routines, like their "steps" or "swimming workout" when they text their data.

Third, wearable fitness trackers allowed users to upload data via common social media sites, including Facebook and Twitter, as well as within social applications made specifically for sharing fitness data with others, such as Nike Run and the Fitbit app. Social media platforms allowed for interaction with multiple people, because social media involves sharing, co-creating, discussing, and modifying user-generated content between individuals and communities (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011). Kim mentioned posting to Facebook "how long I've run and mileage and that kind of thing" and remembered how her social network cheered her on when she trained for a 5k. Dominique was involved with walking and CrossFit groups, which had corresponding Facebook groups where members post their weight loss and fitness progress. Dominique posted her fitness data to Facebook at least two or three times a week.

In addition to sharing data with others, social sites also allowed for reading others' content. For example, Phil explained that he used the Fitbit app, "to see what people are doing." Likewise, Brenda said that her Facebook friends posted routes of their walks online with an accompanying statement, like "I just completed this bike ride," usually on a daily basis.

In conclusion, people communicated fitness tracker data through face-to-face communication and traditional technologies with both strangers and close acquaintances. Furthermore, social media allowed for two-way data sharing and continued discussion surrounding health behaviors with users' social networks. Our interviews showed that participants made sense of this communication in different ways.

### *Interactions Between Fitness Tracker Users*

Results revealed three main ways in which fitness tracker communication shaped users' interactions. Participants discussed how social features of health devices encouraged them to (a) compete with peers, (b) meet their goals, and (c) stay motivated. We present these three findings in order of their prevalence in the data.

#### *Competing with Peers*

Almost all wearable fitness devices rank user data on "leaderboards," which allow users to engage in daily step or mileage competitions. Many participants felt that this communication prompted them to keep pace with others. For example, Katie discussed wearing her device to know how many daily steps she completed, which allowed her to compete in a walking challenge at work. She explained, "At work, I sit...During my step challenge, it made me get up and walk around the office." Many applications visually display step counts, rank each user, as well as send notification messages, which allows users to easily compare their data with others. Robbie explained, "It will definitely tell you... 'Your friends are neck and neck...' or, 'You just got passed, and you better step it up.'" In sum, several participants stated that this "trash talk" and emoticons posted to leaderboards promoted competition between peers.

### *Meeting Goals*

Many participants also felt that communication surrounding their fitness trackers helped them reach their fitness goals. For example, Steve shared, “We will get to just about going to bed and [my spouse] won’t have enough steps. She’ll be like, ‘Oh, I have to walk around the living room’ just to get her 10,000 steps.” Many individuals, like Krista, used the information to “increase my time...see how I’m doing that day, or use it as a gauge” to achieve her goals. As Kim explained, “My Fitbit is connected to my health insurance...that is the major reason why I try to hit my 10,000 steps every day. Because I want those Amazon gift cards.”

### *Staying Motivated*

Lastly, participants discussed how communication surrounding their fitness trackers helped them to remain motivated in health endeavors. For example, notifications, sounds, and messages from wearable fitness devices communicated reminders that motivated users to engage in physical activity. Several respondents explained how their devices motivated them by “telling” participants to exercise. One interviewee, Phil, stated that his Apple Watch motivates him to walk faster, because “You have to walk at a certain pace or have a certain heart rate for [the device] to record those as exercise minutes.” Furthermore, some participants expressed how reminders from their devices would motivate them to be active at work. For example, Brenda explained that her fitness tracker alarm would signal when it was time for a “walking meeting,” which allowed her to be physically active during traditionally sedentary time. Similarly, when asked about application-generated notifications, Robbie replied, “I have my goals set; it’s about 10,000 steps a day, so if I come within 2,500 steps, it will notify me and tell me that I am almost there.” One participant, Hass, described how fitness messages motivated him over time, “It is usually to see my weekly progress. The biggest thing for me is when I’m running, I like to hear when I’ve reached a mile or what that pace was. That’s huge for me because it is either making me feel good or feel bad.”

In sum, the communication surrounding fitness trackers matters. When wearable fitness device messages were communicated, those messages encouraged participants to compete with peers, meet their goals, and stay motivated. Next, we discuss the implications of these findings.

## **Discussion**

Whereas research surrounding wearable fitness devices had previously only looked at the technical features (e.g., calories burned) that influenced health behaviors, the current qualitative study explored the communication surrounding fitness trackers. Through interviews with people wearing such devices, we found how people communicate messages from their fitness trackers, and we explained the effects of this communication.

Specifically, participants reported sharing data from their wearable devices through face-to-face communication, traditional technologies like phone calls and text messages,

and social media. Although health information used to be a private matter, our findings align with research demonstrating that younger generations are more apt to share personal information online (Anderson & Rainie, 2010). Moreover, the social features of fitness devices, such as data visualization, leaderboards, and sharing functionalities, make health messages easier to communicate.

Moreover, the current study found that the messages surrounding wearable fitness devices bring about various changes in health behaviors. Participants wearing fitness trackers discussed how the communication surrounding the devices prompted competition, goal completion, and motivation. Thus, our findings suggest that it is not just the technical features of fitness devices that promote physical activity (Barwais et al., 2013; Shuger et al., 2011); rather, the current study shows the vital role of communication in encouraging healthy behaviors.

These results offer new insight into communication theory by highlighting two important aspects of communication and wearable fitness devices. In one way, our interviews demonstrate that fitness trackers encourage users to share their information, using their data as a vehicle to communicate about their physical activity. For example, respondents discussed how users would post their workouts or steps completed to social media sites. On another level, participants described their devices themselves communicating to the user, using phrases like, “it tells me” or “it made me” when discussing their physical activity. Thus, fitness devices not only promote communication about exercise, but they are also viewed as communicators about exercise.

This finding contributes to the sociomaterial perspective of communication, which views technology and communication patterns as simultaneously social and material (Orlikowski, 2007). In other words, it sees the structural features of technology as constitutively entangled with the action surrounding technology. Despite its popularity, scholars have described how sociomateriality is difficult to study empirically “because technologies and communication patterns are relatively easy to distinguish” (Contractor, Monge, & Leonardi, 2011, p. 685). Most people rarely discuss technology as social; technologies are clearly “non-human” agents. For example, we do not think of a blow dryer or a lamp as technologies with agency or as structures that shape interaction. Thus, discussions of sociomateriality have “remained highly philosophical” (Leonardi, 2013, p. 73). However, by studying the communication surrounding wearable fitness devices, this research offers new opportunities for the study of sociomateriality. Indeed, interviewees *did* view their devices as social beings, “telling” them to walk, stand, or sleep more. Whereas other examples of sociomaterial practices, such as information searches and mobile communication (Orlikowski, 2007) make it easier for scholars to separate the material and social, fitness trackers uniquely show the essence of sociomateriality.

### *Conclusions, Study Limitations, and Future Directions*

In conclusion, through interviews with people wearing fitness trackers, we were able to understand the role of communication in fostering physical activity. Despite a small sample, we reached theoretical saturation and our data identified a wide variety of

experiences with wearables. Because interviews were done in a public park, respondents might have felt social pressure to answer desirably, so we encourage subsequent research to investigate this topic in different contexts with other samples. Future studies might also probe into whether certain device brands, functionalities, user demographics, or other factors influence communication. Furthermore, researchers may investigate the relationship between sociomateriality and sales of fitness trackers. Specifically, the combined material and social features of fitness devices may explain the popularity of trackers, or explain why certain devices are more popular than others. Peers may also be influenced to purchase a device if they perceive the device as necessary for inclusion in fitness activities (e.g., step challenges). Despite these limitations, this exploratory study lays an important foundation by examining the social features of wearable devices and contributes to the sociomaterial perspective of communication, providing novel opportunities for future research using sociomaterial theory.

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