Inside Wearables

How the Science of Human Behavior Change Offers the Secret to Long-Term Engagement

January 2014

Dan Ledger, Principal, Endeavour Partners
Daniel McCaffrey, Behavioral Scientist & Product Manager, SyncStrength

About This White Paper Series

In the last 18 months, wearable devices, such as wristbands, smartwatches, eyewear, wearable bio-monitors, and the complementary services that support them have become the focus of much speculation and anticipation. Companies as varied as large original equipment manufacturers (OEMs), mobile network operators (MNOs), health insurers and service providers are circling a huge potential market alongside tiny startups, all vying for a stake. Yet the path to consumer adoption and sustained long-term engagement is far from clear.   Endeavour Partners has found that many businesses are struggling to understand these technologies and how they can be effectively leveraged to create unique and sustainable value, as well as a competitive advantage.

This white paper is the first in a series from Endeavour Partners that addresses critical strategic issues in wearable devices and services, the factors that are significant contributors to long-term success, how to design workable business models to create and capture value, and future opportunities in this space.

This series will answer several key questions for companies launching their own wearable products and services and those building services on top of the existing products in market.

- Where are the opportunities to create and capture value both in hardware and within the complementary services? How will the business ecosystem evolve in the future? Which types of players will win and which types will lose?

- How are wearable devices changing consumer behavior? Why do so many products fail to achieve long-term utilization?

- What will the future technology and ecosystem landscape look like?

About Endeavour Partners

Endeavour Partners is a boutique strategy consulting firm / think tank with deep expertise in mobile and digital businesses and technologies. We are a diverse team of passionate practitioners including MBAs, engineers, data scientists, behavioral scientists, economists, and programmers. We help clients anticipate the future, navigate the resulting opportunities and develop creative and innovative strategies for growth. For more information about Endeavour Partners or to learn more about the future of wearables, contact Dan Ledger at dan@endeavourpartners.net or +1 (617) 949-1437.
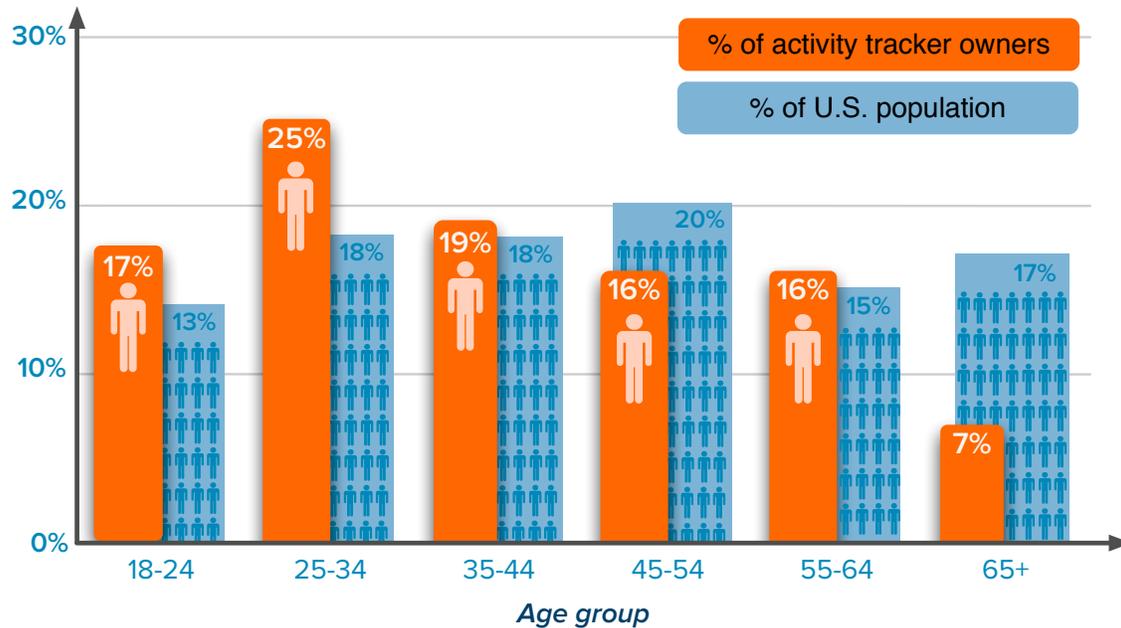
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Wearable Devices are Finally Achieving Mass Market Penetration in the United States

Skeptics and proponents of the wearables market alike recognize the significant technological innovations taking place and the opportunities for profits. Successful ventures in this space will enable new revenue streams through services and/or hardware or increase bottom line revenues by improving healthcare outcomes and reducing costs. For companies across the value chain, the stakes are high.

Endeavour Partners recently conducted an Internet-based survey of thousands of Americans and concluded that as of September 2013, one in ten U.S. consumers over the age of 18 now owns a modern activity tracker from the likes of Jawbone, Fitbit, Nike, Misfit Wearables, and others[1].

1 in 10 Americans over 18 now owns an activity tracker

U.S. Activity Tracker Ownership
(Endeavour Partners, September 2013)

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[1] Endeavour Partners' survey did not include households without Internet access

Percent of Activity Tracker Owners vs. Percent of U.S. Population By Age
(Endeavour Partners, September 2013)

Furthermore, there is a bimodal distribution among users by age. There is a younger cohort of adopters, most of whom fall into the 25-34 age range. These users are primarily focused on fitness optimization. There is an older cohort of adopters between age 55-64, who are focused on improving overall health and extending their lives. There is a broad opportunity to launch wearable products and services targeting different cohorts, and specific personas within those cohorts.

These consumers have adopted — with greater and lesser degrees of success — a variety of wearable products and related wellness services designed to help them live healthier lives by altering their habits.

While some companies have introduced wearable hardware and services, others have built service offerings that leverage the multitude of devices in the market. Each of these has a different value proposition or feature mix that claims to offer a unique method for harnessing the power of the mobile Internet to meet consumer needs and preferences.

For example, mobile network operators such as AT&T, healthcare providers and insurers such as Humana Inc., and data aggregators such as TicTrak and Foxing have each introduced services that integrate with consumers' wearable devices. AT&T's mHealth Platform is an open developer ecosystem that gives consumers the ability to aggregate health data from applications and devices. Humana offers an activity tracker rewards program and an app that integrates fitness and eating behaviors. TicTrak and Foxing collect and aggregate data from different activity trackers and body measuring devices.

The Dirty Secret of Wearables

In the midst of this frenzy of anticipation, the dirty secret of wearables remains: *most of these devices fail to drive long-term sustained engagement for a majority of users*.

Endeavour Partners' research reveals that more than half of U.S. consumers who have owned a modern activity tracker no longer use it. A third of U.S. consumers who have owned one stopped using the device within six months of receiving it.
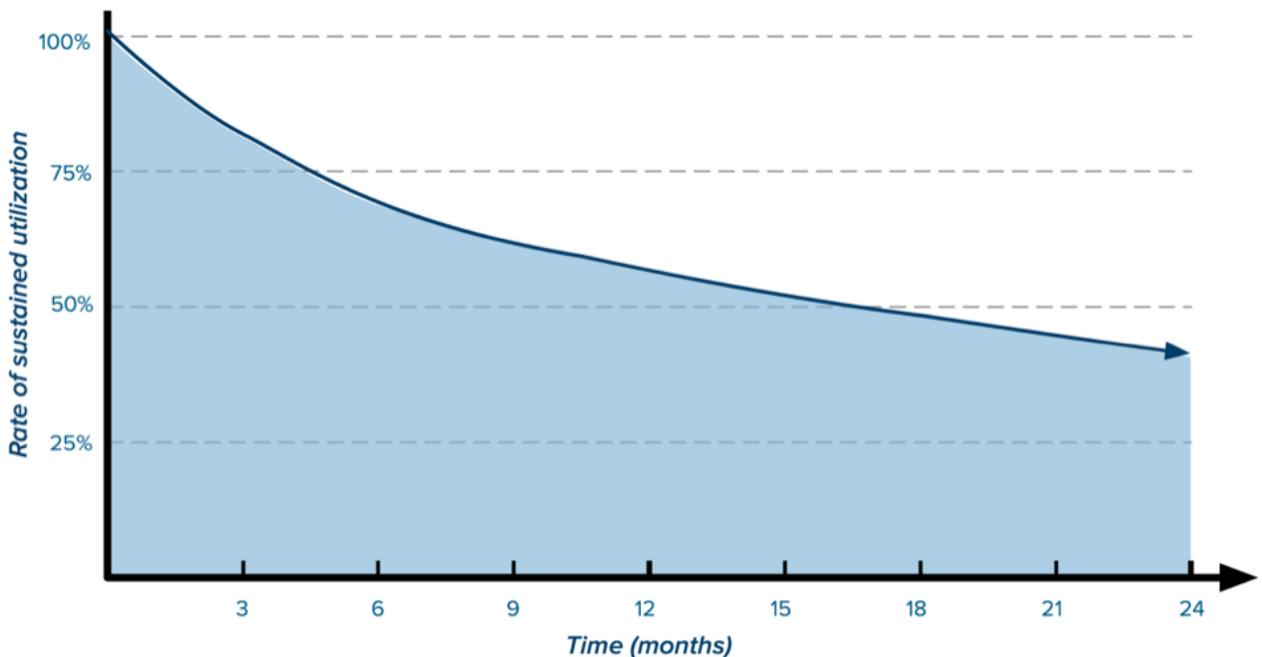
Declining Rate of Sustained Activity Tracker Use Over Ownership
(Endeavour Partners, September 2013)

The lack of long-term utilization raises the stakes for any company incorporating wearables and related data into its products or services. It's not enough to sync with, link to, or work alongside one of the current devices on the market, or to partner with one of the many startups to design an even better device. Designing a strategy to ensure sustained engagement is the key to long-term success in this highly competitive space.

The Goal: Sustained Engagement

The criteria for success for many wearable devices and services goes well beyond adoption. Success is defined by the degree to which these devices and services make a long-term impact on their users' health and happiness.

Products and services that provide utility but fail to have a meaningful impact on users' behaviors and habits -- such as an activity tracker that provides data but doesn't inspire action -- end up failing in the market. Users quickly abandon wearables that don't help them make positive changes. Devices that offer functionality to help the wearer change their habits also promote sustained behavior change and lead to long-term health.

This reliance on behavior change means that traditional product design criteria are only part of the key to developing successful wearable products and services.

There are several well-known criteria that are essential for adoption and short-term utilization of wearable products and services. We refer to these as the "9 baseline criteria" (summarized on the following page). Each of these criteria must be met; a failure in one can lead to the overall failure of a product or service. However, these criteria alone are not sufficient for long-term engagement, which is why we must turn to behavioral science for answers.

The 9 Baseline Criteria

Each of the criteria below must be met to drive initial adoption and utilization; however, these criteria alone are not sufficient to drive long-term utilization

Selectability / Adoptability - The clarity, relevance and uniqueness of the value proposition to consumers is essential for adoption; there are many similar choices in the market and consumers are generally not familiar with this category of devices and services, making selection a potentially stressful experience.

Design / Aesthetics - The majority of wearable products today are worn in a manner in which they are visible. The aesthetics of a product are therefore critical. Companies that embrace design elegance over breadth of features are more likely to find users wearing their products for a longer period of time.

Out-of-Box / Setup Experience - The quality of the initial experience with a product or service is critical. Companies starting from an idealized out-of-box experience will likely achieve a far more pleasant and lasting initial experience than those that don't.

Fit / Comfort / Form Factor - The fit and overall comfort of a device are critical for adoption and sustained utilization. This extends well beyond the comfort of simply wearing the device. Other common activities need to be considered. For example, wrist-worn wearables with thicker bands can quickly become irritating in a number of different activities like typing on a laptop.

Quality / Robustness - As Jawbone experienced in its initial launch of the Jawbone Up, building a reliable wearable device is hard. A device that is designed to be worn on the wrist throughout all of life's activities experiences a high degree of wear and tear.

User Experience - The user experience must be immediately intuitive, familiar and seamless which must transcend the device, the mobile app, web-services, and overall support.

API / Integratability - Many devices and services support APIs such that data can be accessed by other services to create new types of benefits for the users.   As more services become available that can leverage this data, the overall experience improves.

Lifestyle Compatibility - The less behavior change a device requires in order to simply wear it, the more likely that it will drive longer term engagement. The more times per week the user is required to take the device off (to charge or sync the device, or to take a shower), the more likely they are to abandon it.

Overall Utility - Wearable devices and services built around them need to be designed with a clear intent of how they will help people. Products and services that gather data, and simply provide distillations of that data without a clear purpose will fail to achieve any sustained utilization.

3 Behavioral Science Factors for Long-Term Engagement

In addition to the more well-known factors that influence adoption, there are many other lesser-known behavioral factors that are as important – or perhaps more so – to long-term sustained engagement. These factors are less understood and, in most cases, not taken into consideration by companies moving into the wearables space, either with their own devices or with products and services that leverage wearables.

As the market develops and the opportunities and challenges grow, these more nuanced issues will be the ones that can make or break a product. But how can companies know before launch whether a product or service will succeed? The answers to questions about what will encourage or inhibit long-term sustained engagement can be found in the field of behavioral science.

Human behavior is infinitely complex and in many ways, we are just beginning to understand what makes us do what we do. The mechanisms that govern habit formation, motivation, and how we perceive progress are particularly important for sustained engagement.

In this section, we will present these factors in a manner that is accessible to those designing products and services that leverage wearable devices.

Key Factor #1: Habit Formation

Sustained engagement with a wearable device or complementary service depends on its ability to help the user form and stick with new habits.

Psychologists define habits as automatic behaviors or routines that are triggered by situational cues, which are then followed by some form of reward. For example, when we feel lonely (internal trigger) or receive a push notification (external trigger) while riding the subway (situational cue) we check Facebook (behavior), and may experience pleasure (reward). Decades of psychological and cognitive neuroscience research have been spent studying the habit formation process.

Habit formation is a complex process that occurs over time. The behavioral sciences of human decision-making and the applied practices of behavior change, goal setting, cognitive neuroscience and health psychology offer critical insights about this complex process.

Bad habits can be incredibly hard to break, despite a person's desire to break them. Dr. BJ Fogg at Stanford University reports that people so desperately want to change bad habits that they set goals that are unattainable and unrealistic, leading to a vicious cycle of personal failure and disappointment.

Wearable devices can help make the process of habit formation more effective and efficient than ever before. The best engagement strategies for wearables will move beyond presenting data (steps, calories, stairs) and directly address the elements of the habit loop (cue, behavior, reward) and trigger the sequences that lead to the establishment of new, positive habits.

BASIS Science, Inc is currently offering a wearable device, the Basis watch, which has an effective habit change sequence solution. The Basis watch uses four types of sensors in a lightweight customizable design to calculate various health metrics, including steps taken, calories burned, sleep quality and resting heart rate. Basis emphasizes "life-long wellness" and its watch guides users through a sequence of behaviors to create desirable health habits.

Basis' concentration on wellness as a whole, instead of specifically on exercise, helps produce long-term sustained engagement. This is supported by a year-long research study from the University of Michigan. The study showed that participants who adhered to a long-term exercise regimen wanted to "enhance their daily life and wellness" and were not exercising in order to "lose weight." Researchers concluded that rebranding exercise as a means to enhance wellness versus fitness is a more effective way to promote sustainable participation (Segar, 2011).

As Basis users navigate the initial goal setting process, the device sets up a sequence of key habit formation elements -- cues, routines and rewards. Basis only lets users set one goal for the following week because research shows that building life habits is easier when people add changes in small increments over time.

The Basis goal setting sequence requires users to unlock the ability to add new habits by acquiring points (reward) after completing a previous goal related to successfully establishing a habit. From here, daily cues, routines and rewards are continuously sequenced to develop habits for better health.

Key Factor #2: Social Motivation

Sustained engagement with a wearable device or complementary service depends on its ability to effectively motivate users. Social connections are a particularly powerful source of motivation that can be leveraged in many creative ways. In addition to using social connections to influence behavior, social media and networking sites can be exploited to alter habits for positive outcomes. This includes the communication of social norms through 'postings' or 'sharing' of thoughts, pictures and comments with one another.

There are three key social mechanisms which support motivation and broader goal attainment.

First, when users are able to share their goals or compete for goals with an audience or group, they are more committed to achieving these goals (Cialdini, 2001; Ellison, 2007; Locke, 2001). The human factors and mechanisms at work here include social support from friends and family, as well as the fear and guilt from losing social capital by not reaching a goal. Communicating goals on social networks such as Facebook and competing or collaborating with others increases the likelihood of an intention to enact behavior change.

Second, Bandura's social cognitive theory (Bandura, 1986) posits that we learn not just from our own experiences, but also vicariously from observing those around us. This means that people do not learn solely by trying new behaviors and succeeding or failing. For example, if person A observes that person B has lost 10 pounds by using an activity tracker, person A learns that he or she may be be able to lose weight if he or she acquires an activity tracker and replicates the same behavior. Bandura's social motivation research has been used to predict behavior change in various health related situations such as weight loss, smoking cessation and heart attack recovery.

Finally, social factors are huge determinants in our overall health (Lunstad et al., 2010). Matt Lieberman's Social Cognitive Neuroscience research lab at UCLA reports that connecting socially with others is as basic as our need for food, water and shelter (Lieberman, 2013). The extent to which these devices facilitate social connections has a broader secondary effect on users' overall health.

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Leveraging social components into wearable products and services to increase motivational factors must be done carefully. Companies must consider the impact and added value that these devices and services will have on social relationships and interactions as well as personal privacy, cultural influences and shared patterns of behavior. However, when implemented properly, wearable devices can also drive a sustained engagement through existing and new social network platforms and support broader social media strategies.

Two examples of wearables that establish motivation by effectively leveraging social connections are Polar Loop's Flow Web service and the Nike Fuelband SE/Nike+ service.

Through Polar Flow, users are able to connect, share and encourage other people around the world that also have a Polar Loop and are active. This gives the user a sense of an online social network to share and compare with people around the world who also want to do the same. In addition, users are able to view and share running or cycling routes with people with whom they become friends on Polar's platform.

Through the 'Explore' feature, they can see training routes of their 'friends' around the world. Users traveling to new destinations are able to learn which routes and trails make the most sense for them based on a comparison with a friend's training regimen who lives at that destination. This platform allows users to leverage three key social mechanisms: group sharing, observational learning, and improved health through more social connections.

The Nike+ platform encourages users to challenge friends from Facebook and their personal address book who also use the Nike platform. The FuelBand's Nike+ software includes the ability to separate friends into specific lists and groups. This way, users can compare or compete against fellow Fuelband owners and group them into micro communities. The ease of using Facebook puts Nike's wearable ahead of the social competition, and the Fuelband device will connect to other social networks in the future as well. This platform also allows users to leverage all three key social mechanisms.

Surprisingly, there are devices that limit the degree to which users can leverage social channels to provide motivation and commitments to broader goals. For some devices and services, users are unable to communicate within or across platforms to share data socially with other users. This effectively limits the potential for users to reach their goals. For example the Basis B1 logs a great deal of personal data, but does not provide a social outlet to compare or compete with other Basis users.

Wearables may be the next frontier of online social networking as they have the potential to integrate the mechanisms of sociability into our health, work and daily lives.

Key Factor #3: Goal Reinforcement

To achieve sustained engagement, a user needs to experience a feeling of progress toward defined goals.

Dr. BJ Fogg, director of Stanford Persuasive Technology lab, observes that the success from achieving several smaller goals (which he refers to as "baby steps") provides the positive momentum necessary for achieving bigger goals. By setting small goals, people are less likely to over-reach and fall short, and thereby gain the momentum necessary to progress. This allows people to experience a sense of continuous progress.

Continuous progress requires objective feedback about progress and milestones. The right feedback allows people to take the next step needed to gain momentum, move forward and experience regular progress. This is in stark contrast to how people have traditionally received feedback from people like teachers, doctors, coaches, managers or personal trainers; this tends to be far more infrequent and less personalized.

One unique characteristics of wearable devices is their persistent presence. These devices are always aware, always on and always connected to our skin. These wearable devices now are able to track steps, calories, heart rate and body temperature, among other metrics, and do so both passively and constantly. By being constantly connected to our devices, we remain connected to our goals and can experience our progress via on-demand feedback.

Products and services that help people experience continuous progress do so through real-time updates that are powered by big data and insights. These products and services point to a revolution in human persuasion strategy. When people are presented with accurate, clear and concise real-time feedback regarding their actions, they are able to alter behaviors they once thought unchangeable.

The Fuelband SE is an example of a wearable that applies these mechanisms to personal progress. Throughout the day, users are notified directly on the visual interface about 'hours won or lost' based on the activity level for that hour. If users 'won the hour' then they are given positive feedback with a congratulatory message. This way, users are constantly connected to their hourly and daily progress, based on goals already set. In addition to the Fuelband SE, other devices such as the Jawbone Up24 and the Fitbit Force send users hourly cues through haptic buzzes and text message push notifications to support progress. These devices constantly but gently remind users that they need to do something in order to achieve their established goal.

Wearable devices and services have the opportunity to engineer personal progress for users in a way that has never been experienced. These devices and services can now be used as tools that facilitate efficient personal progress and provide feedback that allow individuals to make healthier decisions about diet, lifestyle and exercise. Facilitating personal progress will lead to improved health, user satisfaction and long-term sustained engagement.

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How Modern Wearables Stack Up

The success of a wearable depends on its adoption by the market and how well it inspires long-term engagement. Adoption and sustained engagement depend, in turn, on the twelve critical factors described above. While the nine well-known criteria are crucial for adoption and short-term success, the three lesser known insights offered by behavioral sciences are essential for driving long-term engagement.

Endeavour Partners assessed eight wearables currently on the market. We incorporated them into our lives and experienced their strengths and weaknesses first hand. We then assessed each qualitatively, based on the twelve key criteria discussed in this report. We found that while some companies are clearly thinking about their products holistically, some are missing the mark.
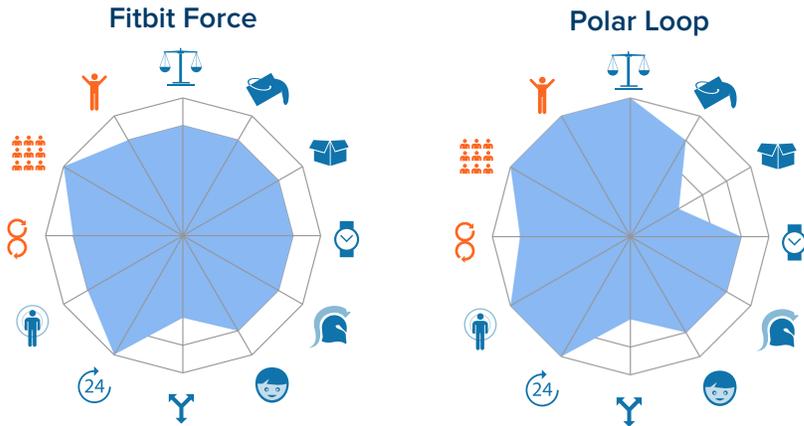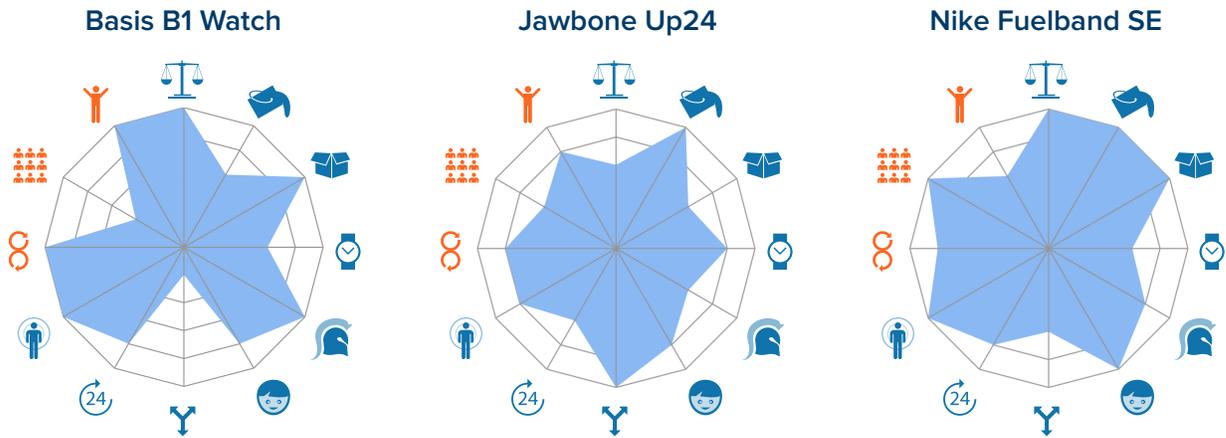
Our assessment, presented on the next page, ranks the Basis B1 Watch, Jawbone Up24, Nike Fuelband SE, FitBit Force, Polar Loop, Withings Pulse, Nike Fuelband, and Skechers Go Walk.

Our research suggests that a low score in just one area can limit initial adoption, on-going use, and ultimately, long-term engagement. Some companies understand this better than others. Polar Loop, for example, scores well on three key behavioral criteria of habit formation, social motivation, and goal reinforcement. It is too early to know whether this attention to behavioral psychology will translate into success in the market.

Some companies are already beginning to embrace the complex science of behavior change and habit formation; however, there remains a great deal of potential for advancements in this area within this industry. Furthermore, technological advancements including the availability of real-time biofeedback (heart rate, skin temperature, blood pressure) and contextual data information (at the office, with a significant other) will change how technology impacts consumers' health-related attitudes, beliefs and behaviors even further. They will also allow companies involved with wearables to create ever more effective and successful devices and services to promote health and wellness.

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How Modern Activity Trackers Stack Up

These graphs show how 8 wearable products in the market score against the 12 essential factors that drive long-term engagement (9 baseline in blue and 3 behavioral in orange)

Basis B1 Watch

Jawbone Up24

Nike Fuelband SE

Fitbit Force

Polar Loop

Withings Pulse

Nike Fuelband

Skechers Go Walk

Legend:

- Selectability
- Design
- OOB Experience
- Fit / Comfort
- Durability
- User experience
- API
- Lifestyle compatibility
- Overall utility
- Habit formation
- Social motivation
- Goal reinforcement

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How We Can Help

Endeavour Partners is a strategy consulting firm with deep expertise in mobile and digital businesses and technologies. We help clients anticipate the future, navigate the resulting opportunities and develop creative, innovative strategies for growth.

We work with top executives of companies impacted by the business and technology forces at play in the mobile and digital sectors. We know how to understand what consumers will want before they realize it themselves.

Why Choose Endeavour Partners?

We have a diverse team of practitioners from a variety of industries including MBAs, engineers, data scientists, behavioral scientists, economists and programmers. We bring years of experience to the table – in business, technical and even academic capacities. This team allows us to bring a multi-disciplinary perspective to our engagements and to offer more nuanced analysis and insight.

We have developed a broad network of relationships within our areas of expertise, built over years of experience working in mobile and digital technology.   We activate this network in our engagements to understand how each player in an ecosystem is thinking and likely to act. In addition, we are closely aligned with academic institutions – MIT, Harvard and London Business School – that drive leading-edge thinking in business and technology.

We love what we do. We are passionate about mobile and digital technology and passionate about driving our clients' success. This translates into highly driven and active thought partners who are eager to have an impact.

For more information about Endeavour Partners or to learn more about the future of wearables, visit us at www.endeavourpartners.net, or contact Dan Ledger at dan@endeavourpartners or +1 (617) 949-1437.

About the Authors

Dan Ledger, Principal, Endeavour Partners

Dan is a principal at Endeavour Partners where he has led a great deal of research on wearable devices, and consumer wellness in general. Dan has advised numerous startups, as well as larger service providers on product definition, service design, ecosystem strategy and go-to-market planning within this space. Prior to joining Endeavour Partners, Dan worked for almost 15 years in the chipset business as an embedded system engineer and manager. Through this experience, he brings a rich understanding of the underlying technologies that go into wearables, and how they are evolving. Dan holds a Master's Degree from the Massachusetts Institute of Technology and a dual Bachelor's Degree from Washington University in Electrical Engineering and Computer Engineering. He can be reached at dan@endeavourpartners.net.

Daniel McCaffrey, Behavioral Scientist & Product Manager, SyncStrength

Daniel is a behavioral scientist and co-founder of SyncStrength Data Analytics who consults with companies on combining behavioral science and mobile technology in the broader consumer health space. He has experience across the healthcare ecosystem as a behavioral scientist (Harvard Medical School), clinical researcher (National Institute of Health) and health consultant (Co-founder of iBELIEVE). His past research in neuroscience and cognitive psychology was conducted at the Brigham & Women's Hospital, Massachusetts General Hospital and the National Institute of Mental Health. He has published multiple peer reviewed articles and book chapters in neuroscience and neuropsychology. Prior to this, Daniel gained valuable management experience in the private sector at Goldman Sachs & Company and Citibank. Daniel holds a Bachelor's of Science and a Master's of Business Administration from Quinnipiac University and a Master's Degree in neuropsychology from Suffolk University. He can be reached at daniel@syncstrength.com and @demccaffrey.

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