Marketing Insights:
A Netnographic Study of the Fitbit Sleep Better Online Community

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Despite growth in the wearable technology market, few studies investigate the various ways in which consumers use these devices. This research aims to understand the Fitbit "Sleep Better" online community; a niche customer segment who use fitness trackers for sleep-related functionality. We collect data using a web crawler and analyze it using a netnographic research method. Our preliminary analysis reveals themes of cocreation, brand love and brand trust. Our main analysis reveals the moderating role of update aversion on the bilateral interactions between the preliminary themes. The research implications, limitations, and future research directions are discussed.

Keywords: netnography, co-creation, brand love, brand trust, update aversion

INTRODUCTION

Since the launch of its' first fitness tracker in 2007, Fitbit's product line has grown to include smartwatches that offer an array of features to help users achieve physical and personal health goals. Technical advances are enhancing the ways in which users benefit from the product. This is translating to significant industry profits. Revenue projections for wearables are projected to reach $54 billion by 2023 (Barkho, 2019). Fitbit holds the second largest market share with unit sales of 16 million (Statista, 2020) and over 2.8 million active users (Heater, 2019). This strong market and company performance motivated Google's $2.1 billion acquisition of Fitbit in November 2019 (Heater, 2019). The partnership is viewed as

an opportunity to accelerate innovation and to make healthy living even more accessible to everyone (Heater, 2019).

Research shows that wearable technology and mobile applications can improve a user's overall health (Marcotte & Hunt, 2017). A recent Accenture study shows that more than half of respondents (52%) express interest in buying fitness devices to manage physical and personal health (Solomon, 2018). Yet, few studies investigate the various roles of wearable technology for its consumers. Both industry and academia place a strong emphasis on the physical fitness aspects of wearable technology rather than its ancillary features. The Fitbit website contains slogans such as "fit for everybody" and "only Fitbit gives you the freedom to get fit your way". This myopic focus creates a gap in the understanding of the subset of consumers who use wearable technology for other purposes. Thus, the first aim of our study is to bridge this gap by understanding how consumers use Fitbit's sleep function. Our second aim is to understand the largely neglected topic of consumer preferences regarding firmware updates. The limited literature on firmware updates has focused almost exclusively on technical and security aspects rather than user experiences (Vitale, Mcgrenere, Tabard, Beaudouin-Lafon, & Mackay, 2017). One reason to explain this research oversight is the sparsity of data in forum communications (Woolley, Collins, Mitchell, & Fredericks, 2019). To our knowledge, no existing studies have used a netnographic approach to study consumer responses firmware updates to ancillary functions of fitness trackers. The present study bridges these research gaps by offering marketing insights vis-à-vis a netnographic study of the Fitbit "Sleep Better" Community (FSBC).

The FSBC is a Fitbit-hosted online forum comprised of a unique collection of individuals who have developed a relationship with the Fitbit brand and the sleep-related features its products offer. The FSBC constitute a subculture of consumption. According to Schouten and McAlexander (1995, p. 48) "a subculture comes into existence as people identify with certain objects or consumption activities and, through those objects or activities, identify with other people." FSBC members use their Fitbit to record sleep patterns to develop healthy sleeping routines and then engage in the forum to post or read a variety of sleep-related content. In studying the FSBC, we advance the conceptual understanding of a unique consumption subculture and offer actionable insights to market ancillary functions of wearable technology devices to a niche customer segment. We use a deductive approach to address the following research questions:

1. What theoretical and managerial insights can be gained from the FSBC?
2. What is the link between the recurring themes of cocreation, brand love, and brand trust within the FSBC?
3. What is the impact of update aversion on these recurring themes?

To address these questions, the balance of this manuscript is organized as follows. We begin with a literature review of cocreation, brand love, brand trust, and update aversion. Next, we present a theoretical framework of how these factors interact within the FSBC. Then, we describe our methodology and key findings. Finally, we conclude with a general discussion including theoretical and managerial implications as well as limitations and recommendations for future research.

LITERATURE REVIEW

The themes and trends identified in the dialogue of the FSBC guided and shaped the literature review and theoretical framework. In our preliminary investigation of the FSBC, recurring themes of cocreation, brand love, and brand trust emerged. Our main study confirmed the presence of these themes but also revealed a counter-intuitive insight on how update aversion moderates these earlier themes. We briefly examine the theoretical underpinnings of each of these concepts in more detail below.

Co-creation

One of the ways that consumption subcultures create value for brands and community members is through co-creation. Prahalad and Ramaswamy (2004) define co-creation as the value created by the interaction between consumers and firms. Co-creation is a bi-directional process that, if executed

effectively, stands to benefit both consumers and firms (Prahalad & Ramaswamy, 2004). Pre-requisite is the existence of an environment where consumers can engage with other consumers to derive and work together to create experiences (Prahalad & Ramaswamy, 2004). Firm-hosted online blogs and forums provide a platform for cocreation that can be leveraged to drive product innovation (Nambisan & Baron, 2009). Consumer's participation in these virtual brand communities is motivated by a sense of membership, reputational status, and perceived benefits of participation (Nambisan & Baron, 2009). One benefit is product innovation which enhances customer utility. As firms incorporate customer feedback into their product development, customer utility is enhanced by these value-added features. The increased utility from this cocreation process can enhance product attachment (Teichmann, Scholl-Grissemann, & Stokburger-Sauer, 2016; Mugge, Schifferstein, & Schoormans, 2010). Kumar, Townsend, and Vorhies (2014) show that marketers use cocreation to foster an emotional connection to the brand and that this relationship can be classified as brand love.

Brand Love

Brand love is defined by Carroll and Ahuvia (2006, p. 81) as "the degree of passionate emotional attachment a satisfied consumer has for a particular trade name." It is linked to desirable post-consumption behaviour (Carroll & Ahuvia, 2006). Specifically, as it applies to electronic products, Batra, Ahuvia and Bagozzi (2012) identify seven dimensions of brand love including: (1) passion-driven behaviours (desire to use, willingness to invest resources, high involvement); (2) self-brand integration (desired and current self-identity congruence, life meaning, and frequent thoughts); (3) positive emotional connection (intuitive fit, emotional attachment, positive affect); (4) long-term relationship (prolonged use and or ownership); (5) anticipated separation distress (do not want to be without it); (6) overall positive attitude valance (positive words used to describe the brand); and (7) high confidence. Upon subsequent empirical validation, these seven dimensions were found to be predictors of perceived quality, customer loyalty, positive word-of-mouth, and resistance to negative information (Bagozzi, Batra, & Ahuvia, 2017).

This resistance of negative information, as an antecedent to brand love, can help to explain why Fitbit users derive utility from their devices notwithstanding the ongoing debate about the medical inefficacy of wearable technology. Some clinical evidence warns that wearable technology should not be used to derive medical insights (Daligadu, Pollock, Carlaw, Chin, Haynes, Thevaraajah-Kopel, Tahsinul, Walters, & Colella, 2018; Sushames, Edwards, Thompson, McDermott, & Gebel, 2016; Baroni, Bruzzese, Di Bartolo, & Shatkin, 2016). Likewise, manufacturers are careful not to market their wearable health trackers as medical products (Woolley et al., 2019). Nonetheless, the sale of over 16 million Fitbit units in 2019 suggests that Fitbit users continue to derive value from the use of health information provided by their devices (Statista, 2020). Thus, if medical insights are not the driving force for value creation then brand trust might help to explain how this value is being created for Fitbit consumers.

Brand Trust

To further elaborate on the high confidence element of brand love, one needs to reflect on the element of trust. Trust is an important foundation to develop favourable attitudes that foster cooperation and commitment in buyer-seller interactions (Dwyer, Schurr, & Oh, 1987; Ganesan, 1994). Delgado-Ballester, Munuera-Aleman, & Yague-Guillen (2003, p. 37) define brand trust as "the confident expectations of the brand's reliability and intentions in situations entailing risk to the consumer." Implicit in brand trust is the expectation of positive outcomes for the user. Reliability and dependability are inherent components of brand trust (Dawar & Pillutla, 2000). Thus, brand trust is a consequence of a firm's willingness and ability to consistently deliver on its promise to create value for the consumer (Delgado-Ballester & Munuera-Alemán, 2005; Delgado-Ballester, Munuera-Aleman, & Yague-Guillen, 2003; Doney & Cannon, 1997). Chaudhuri and Holbrook (2001) found that brand trust (the ability of a brand to continue to meet its obligations) and brand affect (positive emotional response to brand use) combine to predict brand loyalty and attitudinal loyalty. Furthermore, decreases in perceived brand trust can result in decreases in both brand and attitudinal loyalty (Chaudhuri & Holbrook, 2001). In the context of technological products, software updates can moderate brand trust when they fail to meet expectations of performance continuity.

Update Aversion

Wearable technology uses hardware embedded with firmware to provide a user interface that interacts with cloud applications through apps that can be automatically updated to significantly impact both the look and functionality of a device without user intervention (Woolley et al., 2019). While there are limited studies examining consumer reactions to firmware updates, Martonik (2015) found that even small changes can impact users negatively. Forced upgrades are generally found to annoy users because they must expend spend time relearning the system functionality (Vitale et al., 2017). In a study investigating user responses to Apple's OS X software update, Vitale et al. (2017) found that more than half of users had negative reactions to the upgrade process. There is also evidence to suggest that feature updates which modify core design or functionality aspects can negatively impact continuance intention and reduce customer loyalty (Hong, Thong, Chasalow, & Dhillon, 2011). Recent studies show that perceived performance issues can lead to the abandonment of fitness trackers (Pour, 2019). Similarly, Attig and Franke (2020) find that a primary reason for user abandonment is perceived data inaccuracy from fitness trackers. Our theoretical framework demonstrates how update aversion moderates the bilateral interactions between cocreation, trust, and brand love.

THEORETICAL FRAMEWORK

Within the FSBC, there are bidirectional interactions between cocreation, brand love, and brand trust. Figure 1 graphically depicts these relationships. As depicted in Figure 1, there is an interaction between cocreation and brand love. Cocreation can enhance brand love (Kumar, Townsend, & Vorhies, 2014) and customers experiencing brand love are more likely to engage in co-creating behaviours within a brand community (Kaufmann, Loureiro, & Manarioti, 2016). Members of online brand communities share brand love to seek both citizenship and status. Figure 1 shows that the relationship between brand love and trust is also reciprocal. Trust is a proxy for the high confidence element of brand love, and one outcome of brand love is resistance to negative information which can be construed as a signal for brand trust. Taken together, if one element of brand love is very high, the other elements of brand love could be positively influenced via parallel elements of brand love. To illustrate this effect, consider the elements of a long-term relationship. If there is a high degree of confidence (high trust) in the product and brand, then it is logical that there would be a positive emotional connection that would increase the length of the relationship. Finally, as graphically depicted in Figure 1, update aversion can moderate the relationship between trust and cocreation which interact with brand love. Members use the forum as a cocreation platform to express negative evaluations of these firmware updates. In so doing, FSBC members show expectation-confirmation dissatisfaction and update aversion. This dissatisfaction links to the concept of brand trust, where update averse users develop perceptions of unmet performance expectations. Depletion of trust can erode brand love via its high confidence dimension which in turn can disincentivize members to further engage in cocreation with the brand. We now turn to our netnographic analysis of the cocreation, brand love, brand trust, and update aversion themes that inform this theoretical framework.

FIGURE 1
THEORETICAL MODEL
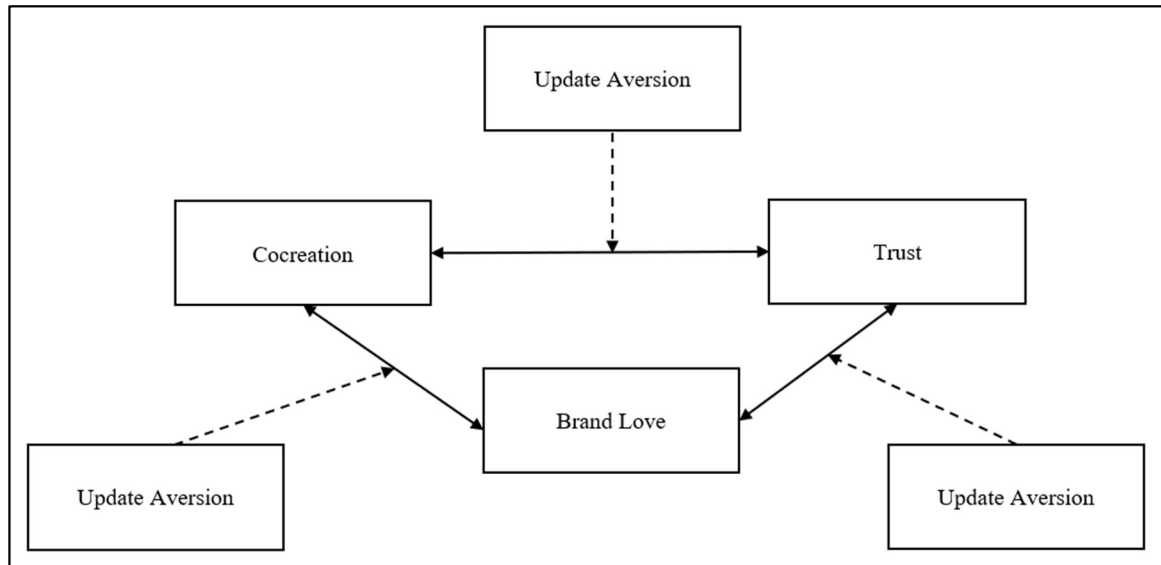
RESEARCH METHODOLOGY

The research team is comprised of not all but some members who are familiar with the research context. Three members of this research project use Fitbit devices to achieve health and fitness goals and two members specifically use the sleep function, one of whom has recorded up to two-years of sleep data.

The research methodology employed in this study is a netnographic analysis. Netnography is the application of ethnographic methods to study an online community in a more natural, unobtrusive, time- and cost-efficient manner than other qualitative techniques like focus groups or interviews (Kozinets, 2002). After investigation of several wearable device forums, we selected the FSBC for this study because it meets Kozinets' (2015) five-fold examination criteria for netnographic examination, being: a focused research relevant group; high traffic of postings; large numbers of discrete posters; rich descriptive data; and high between member interaction. First, as the dominant subculture of consumption for the Fitbit sleep function, FSBC members are the appropriate target group to study the relevant research questions herein. Second, between January 18, 2014, and March 18, 2019, the FSBC had 939 threads comprised of 6,836 posts representing a high volume of posts. Third, there are many posters with 1,334 unique community members. Fourth, there is rich descriptive data with lengthily and vivid posts that express a range of emotions. Fifth, there is a high degree of interaction between members of the FSBC with average thread replies ranging from 0-324 and post views ranging from 0-168,658. Thus, there is enough quantity and quality of contextual data to enable valuable conclusions to be drawn from this netnographic investigation. The Fitbit forum also enabled researchers to observe members of the FSBC covertly to cause minimal harm or disruption to the consumption culture. We will now explain the data collection process.

Data Collection and Data Analysis

Data collection is carried out in two stages, both of which use an ad hoc polite web crawler. In the preliminary stage, we enter the keywords "sleep better" into the search function on the Sleep Better forum to produce a sample of 205 posts. We carry out the analysis using grounded theory whereby data is collected (via a web crawler), systematically reviewed, and grouped into themes repeatedly until no further insights can be generated (Glaser & Strauss, 1967). Themes arising from the preliminary stage findings are used as initial codes for the main analysis. In the second stage, the web crawler retrieves and stores all posts from the Sleep Better forum (6,836 posts). Data is exported from SQL to Excel and then imported into NVivo to

perform a frequency analysis of the 1000 most commonly occurring words using word stems and auto-detection of positive and negative sentiment. Overwhelmingly, the most commonly occurring words are "Fitbit" (3,403 occurrences) mentioned on average in one out of two posts within the forum, and "sleep" (12,716 occurrences) mentioned on average 1.88 times per post. As anticipated, the valance is primarily negative (N=4,727) rather than positive (N=3,667) signalling a high degree of co-creation in sharing sleep-related problems amongst community members. We then carry out a thorough content analysis to confirm the preliminary findings and provide support for our theoretical framework.

RESULTS

Preliminary Findings

In the preliminary analysis, two reviewers each independently identify initial themes in the data, highlighting co-creation, brand love, and brand trust. Co-creation accounts for 23% of posts in the sample and is linked to members sharing product sleep function and general sleep advice creating values among themselves and value for the product or the company. Brand love accounts for 13% of posts and is exemplified through quotes that established high product attachment and trust in the brand. Brand trust accounts for 36% of sample posts and is demonstrative by belief and trust that the sleep function of the Fitbit is effective at tracking sleep patterns. Quotes exemplifying these initial three themes are as follows:

1. Co-creation: Well, my doctor and I discussed my totally messed up sleeping pattern and she gave me some homework. Set your alarm, everyday, even on your day off, at the same time... Do not ask me the logic behind it because I do not know, but my friend said it might have something to do with hormones and your bio clock. – MellowYellow
2. Brand Love: I am a new user of my fancy tech; I go nowhere without it and love it! The main reason I bought the fitbit was to track sleep. – mickeyyc
3. Brand Trust: I've logged a couple weeks worth of sleep since I got my Charge2 and I've been impressed with how relatively accurate the sleep reports seem to be based on my recollection of each night. – Katelynfarley

The inter-coder reliability for the preliminary analysis is 76% between the two coders. The challenge in attaining full consensus stems from the complexity of categorizing posts that exhibit more than one theme. Through dialectic research inquiry, two coders discuss their rationales with a third coder after which near-consensus is attained (97% inter-coder reliability). These initial themes are used to shape the next stage of this study and to address the research objective and research questions.

Main Findings

Our main study involves a thorough content analysis of 6,836 posts from the FSBC forum to confirm the preliminary findings and provide support for our theoretical framework. Clear evidence of three persistent themes emerges from the data: co-creation between consumers and the brand, declaration of the seven dimensions of brand love and the existence of strong trust within the brand community. In addition, the theme of update aversion within the brand community emerged from the in-depth content analysis. The results from the main study are outlined in further detail below.

Co-creation Supported Within the Brand Community

We find evidence of three types of co-creation arising from the postings in this online community. The first type of co-creation aims to create value for the company as members share advice on how Fitbit can enhance the user experience through product innovations.

> The fitbit one tracks sleep and has an alarm. Why not incorporate the two and provide functionality like that of the Sleep Cycle Alarm Clock where it will wake you during 'light' sleep??? I'm always looking for ways to consolidate gadgets!! Thanks! - Deborah_B

What I'm trying to do is get more quality of sleep, and if I can get my sleep patterns in a CSV or summarized over a time period (say a week) that would be helpful. I know the fitbit webpage already lists how much I sleep, but I'd also like to see percentage in each stage of sleep. That will allow me to compare whether I sleep better on mattress A vs B, if eating before bed (and what I eat) vs. going to bed hungry, thirsty vs. hydrated etc. It would also be helpful if there was a field for each night to enter notes. – MNGuy

The second type of co-creation aims to create value for the FSBC members by sharing tips on how to use the product. Our analysis reveals a hierarchical structure within the community where posters with longer tenure or product knowledge tend to guide novices for the proper use of the sleep function of their Fitbit. In the following example, a member peacocks their status within the community by demonstrating how they experiment with the sleep functionality of different Fitbit models.

Here is what sleep tracking looks like with the new Charge and the One, for the same sample night... With both trackers, I've been using Normal for Sensitivity to movements. Based on that one sample night, the One appears to be slightly more sensitive than the Charge (detected more times being awakened). I posted another comparison (steps, calories, VAMs, floors) in this thread. - Dominique | Finland

The third type of co-creation aims to create value for the community members beyond the functionality of the product itself. Members actively share techniques that they use to sleep better ranging from prescription medications to more unconventional tips such as taking a multivitamin or using scented candles.

A friend recently told me that her trainer suggested taking a multi vitamin just before bed, saying it would help her get up and go in the mornings... I think tonight is my 5th night doing this, and I swear I've bounced right out of bed each morning. - Awen

I am a night owl, not by choice. I would like to go to bed at a decent time so I set an alarm on my Fitbit. I tend to relax and sleep better when I smell the scent of peppermint and Jasmine from a fragrant candle. I might invest in a sleep mask. – Avidcyclist

Brand Love Declared Within the Brand Community
The data confirms that FSBC members exhibit Batra, Ahuvia, and Bagozzi's (2012) seven dimensions of brand love, each of which is examined in further detail below.
1. Passion-Driven Behaviours: FSBC members display passion-driven behaviours including a desire to use the Fitbit, willingness to invest resources, and high involvement. This is evident by the sheer volume of posts, post replies, high-frequency mention of the brand name, and claims such as the one below that attribute magical properties to the Fitbit such as the ability to predict illness.

I've had my Fitbit HR since March now and I've been sick many times, and Very Consistently I notice that my resting HR spikes up to "72" and stays there while I'm at the peak of sickness, and comes down when I'm well. Whatever formula they have seems to be extra magical in predicting the onset of viral illness because it starts to go up 2 days before I get any symptoms. - angelafoodcake

2. Self-Brand Integration: FSBC members display self-identity congruence with the Fitbit brand. The most obvious display of self-brand integration is through introductory posts and profile names where community members align themselves with a particular model or generation of Fitbit. Users begin their post with phrases such as "Charge one user" or "New Fitbit (Flex) user

here". Another way that users make this association is by including their Fitbit model in their online usernames. For example, users like "AllieIonic" post about their experiences with Fitbit's premium models (i.e. the Ionic).

I'm reading this book at the moment, after listening to the authors podcast on the subject. It's really insightful and I definitely recommend it to anyone wanting to improve their sleep https://www.amazon.co.uk/Sleep-Smarter-Proven-Better-Success/dp/0984574522   Last night I applied magnesium oil directly to my skin before bed as advised by this author and, although I slept for a shorter amount of time due to commitments last night, both my REM and deep sleep showed as much improved according to my sleep stages. - Allie IONIC

3. Long-Term Relationships: While some members like Allie use their association with high-end Fitbit models to signal social status within the FSBC, others reference their long-standing relationship with the brand. The Fitbit company reinforces this social hierarchy by rating members who have higher tenure and engagement within the community as "most helpful" posters. Long-term Fitbiters like G2ESW, start posts by boasting about their long-term relationship with the brand:

Been a fitbit user for many years. The main reason being I needed to monitor my sleep and attempt to understand what causes me a bad night. – G2ESW

Hi All, Been a fitbit user for many years…. I am sure you have all discovered that REM sleep is critical, without it we don't recover. You only need to be in REM for seconds to get this benefit, but the damage of not getting there is cumulative… What I would like from fitbit is the ability to automatically monitor for REM. That is, the graph will show if we get to and beyond 90 minutes. - G2ESW

4. Positive Emotional Connections: FSBC members exhibit brand love in the form of an intuitive product fit, emotional attachment, and positive affect. This can be seen through comments such as

"I wear mine religiously and slept with it… my surge is on my body almost 24/7." – kpx.

5. Anticipated Separation Distress: FSBC members do not want to be without their Fitbit or its functionality. Separation distressed is evident in member's update aversion, which is discussed in further detail below. Some members even develop addictive tendencies in using the sleep function of their Fitbit devices.

I have become a little obsessed. – galaga6846

I want to go back to tracking sleep but trying not to over-obsess about it is going to be a challenge. – tieshask8

6. Positive Attitudes: FSBC members have complaints related to their sleep but negative sentiment is rarely directed towards the product itself. When it is, most complaints relating to the product are those concerning separation distress stemming from the removal of product functionality (update aversion). Overall, members exhibit positive feelings about the sleep function of the Fitbit and towards other members of the community.

Hi! I have been happily wearing my Charge 2 since May of this year. Seems like I am sleeping enough but consistently only getting like 1-1,5 hours of REM sleep and similar amount of deep sleep. According to the fitbit article on sleep stages I need more. I am wondering if this is unusual, if I should do something about this or if this could have anything to do with how my Charge 2 tracks me. Any ideas are welcome! – Klaartje1978

7. High Confidence: FSBC members believe in the efficacy of the sleep function of the Fitbit. They trust that it tracks their sleep accurately and that monitoring their sleep patterns is a value-added feature. Even when community members acknowledge some clinical limitations, they still credit the device as being a good means to meet their personal objectives.

Fitbit only records "restless" and "deep sleep" and of course it's not based on brain waves, so there's no way to know when you've been in REM sleep, etc. However, it gives you a pretty good idea of the amount of sleep you're getting. – JeanetteLH

Every morning when I check how long I slept, my dashboard always tells me how many minutes I spent 'awake' during the night. – garnish

Brand Trust Exhibited by Brand Community Members
Throughout our analysis, it became evident that FSBC members exhibit strong brand trust for their Fitbit and the efficacy of its sleep functionality. Brand trust is linked to the high confidence element of brand love. Despite clinical evidence discrediting the medical validity of data, FSBC members show confidence in Fitbit's sleep analytics to "diagnose sleep disorders" or at the very least open a dialogue about their results with a doctor. One user demonstrates this confidence in their Fitbit data:

That's why I'm posting this, so that some of you might feel confident enough to tell your docs that you think there might be something more than just your average sleepiness. – JeanetteLH

Interestingly, even when the product does not function properly members are so committed to the brand that they defend its efficacy and blame themselves for improper use. Some go as far as citing personal anecdotal 'proof' of clinical support for the efficacy of the sleep function of their Fitbit.

I'm not quite getting 8 hours, one of the nights I did swap FitBits with my partner to see if results changed, … and as you can see they didn't, so its not a faulty FitBit or anything, its a faulty me. – labinopper

Fitbit has definitely helped me sleep better. I have had difficulty with sleep for quite a while now. By using fitbit my doctor and I have been able to come up with a treatment plan that has improved my sleep. We were able to identify the problem. I think it's funny that one of the first things my doctor asks me for is my sleep log from the app. – anonymous

Update Aversion
Members of the FSBC exhibit a high degree of update aversion. With a few exceptions (e.g. SnapperUK who says "Love the new sleep stages"), FSBC members generally crave consistency in the use of their Fitbit. They trust and rely on the way that information is displayed and are generally dissatisfied with firmware changes. Members take to the forum to vocalize their disappointment at the loss of functionality that was previously available to them. The following posts demonstrate FSBC members' strong update aversion.

> I used to be able to click on the different colors on the sleep chart to tell me the time I was restless or awake during the night. That doesn't work anymore. Unsure if this happened before or after the update on March 20. Anyone else experiencing this issue? – blusher4

> In the past few weeks the sleep information I used to get from my Fitbit has changed -- and for the worse IMHO… Is there a way to return to the previous sleep view mode? The main reason I got my tracker is to track sleep quality. That information is no longer available so far as I can tell. – ZolliStar

Our theoretical framework shows how update aversion may adversely impact the bilateral interactions between the three main themes. Consistent with existing literature, we find a bilateral interaction between brand love and cocreation. Brand love motivates FSBC members to use the forum as a platform to communicate cocreation with other community members as well as the brand itself. Cocreation between members is generally positive, but when directed at the company the sentiment is mixed. Some members, like Deborah_B and MNGuy offer ideas that Fitbit can use to improve its functionality, however others like MaryAnne use the platform to express disappointment with changes in functionality. We can see from the statement below that update averse members like Mary Anne use the FSBC forum to express their separation distress (one of the seven dimensions of brand love) concerning system display updates. Implicit in this cocreation is trust (high confidence dimension of brand love) that the company will entertain requests and modify the software to meet consumers' needs for consistency.

> I would like to see the return of the sleep efficiency percentage on the website. It is immensely helpful and was easy to see the restless, asleep and awake times during sleep. The new version is less easy to read and the elimination of the sleep efficiency percentage is a great loss. Please put the sleep efficiency back! mary anne – mamfranco

We observe a similar interaction between brand love and brand trust within the FSBC. The post by Quinnfit serves as an example to demonstrate the impact of update aversion on the interaction between brand love and brand trust.

> I've been using sleep stages for about five months with no problems. Suddenly sleep stages of disappeared…. There is something wrong with the Fit bit application. There is a bug. Please fix it ASAP. – Quinnfit

Consistent prior use is indicative of several dimension of brand love including long-term relationship and high confidence (brand trust). Members trust the brand to deliver consistently on their expectations for performance continuity. However, Quinnfit perceives the update as a 'bug' which demonstrates disappointment in the loss of the desired functionality. Since there is a high level of trust amongst members of the FSBC, negative cocreation amongst in-group members like Mary Anne and Quinnfit may adversely influence other members of the brand community, thereby compromising their trust in Fitbit's ability to meet ongoing needs. Here we see the impact of change aversion on the interactions between cocreation and brand trust.

The thematic interactions between cocreation, brand love, brand trust, and update aversion within the FSBC provide support for our theoretical framework. We show how unmet performance expectations stemming from firmware changes can negatively impact bilateral interactions between the main themes. We now turn to a discussion of the theoretical and managerial implications of these findings.

CONCLUSION

Research Contributions

Theoretically, this research contributes to oft-overlooked marketing research on a niche customer segment of consumers who derive utility from the ancillary attributes of wearable technology rather than its physical fitness functionality. We show how a subset of consumers use the sleep function of the product to create value for themselves, other community members, and the brand. Our study reveals bilateral interactions between the recurring themes of cocreation, brand love, and brand trust within the FSBC. Also, our research contributes to the largely neglected issue of users' experiences with firmware embedded in wearable technology. We offer support for a theoretical model that shows how change aversion can moderate the interactions between brand love and cocreation, brand love and brand trust, as well as cocreation and brand trust.

Managerially, understanding how customers use wearable technology to improve sleep enables manufacturers to better target this niche segment. Firms can develop marketing techniques to increase product attachment and thereby grow their brand equity. Another important managerial implication is the importance of software consistency. Compromising brand trust can have a ripple effect on different aspects of brand love and decrease the perceived utility of the product. To mitigate update aversion, firms should either allow users to give consent to substantive changes (Fagan, Khan, & Nguyen, 2015) or only add firmware updates to new models. This allows users who want higher functionality to upgrade their device and lets those with high update aversion maintain the status quo. Our study of the FSBC reveals several marketing insights for Fitbit, but it is not without limitations.

Limitations and Future Research

While thorough, this research is not without limitations. One of the most significant challenges stems from the coding of posts containing multiple themes. The dominant theme coding mechanism that we use in our analysis may undermine the importance of subordinate themes. Other methodological approaches, such as NLTK or data mining, may reveal latent insights not detected by the coders. Another limitation is that we only use English posts. Future studies could examine posts in other languages to see if there are cultural differences amongst subcommunity members of the FSBC. Similarly, this study could be extended beyond the "Sleep Better" forum to see if there is support for our theoretical model in other communities. Firm-hosted online forums provide a rich data source that can be leveraged to gain marketing insights for theory and practice.

Conclusion

Through a netnographic study of the FSBC we find that brand love motivates users to engage in three types of cocreation that create product-related value for the company and community members as well as non-product related value for the community. As tenured members share their knowledge and expertise with new users, they gain credibility and hierarchical status within the community. These networks of connections within the community are an invaluable resource for members and this communal support system reinforces brand love. While update aversion was evident within the FSBC there was a high degree of brand trust within the community. Of the thousands of posts examined within the FSBC, less than 1% questioned the efficacy of the Fitbit technology or insinuated that this was a product not worth buying. When change adverse posters did use the platform to express concerns for lost functionality, they did so intending to cocreate value for both members and the brand. Negative posts and complaints were almost always veiled by brnad love and brand trust. Many members experience sleep-related difficulties and they rely on the FSBC as a source of support and guidance for these issues. In hosting the "Sleep Better" forum, Fitbit provides a platform of cocreation that fosters brand trust and enhances brand love amongst community members. We hope that the marketing insights offered by our netnorgaphic analysis of the FSBC will motivate future research on specific marketing techniques that can be leveraged to ameliorate update aversion and enhance brand love, brand trust and cocreation in other subcultures of consumption.

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