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at [https://doi.org/10.1007/978-3-319-91485-5\\_4](https://doi.org/10.1007/978-3-319-91485-5_4)

**Cite as:**

Ilhan, A. (2018). Motivations to Join Fitness Communities on Facebook: Which Gratifications are Sought and Obtained? In G. Meiselwitz (Ed.), *Social Computing and Social Media. Technologies and Analytics* (pp. 50–67). Cham, Switzerland: Springer (Lecture Notes in Computer Science book series; 10914).

## Motivations to Join Fitness Communities on Facebook: Which Gratifications Are Sought and Obtained?

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**Abstract.** Activity trackers are providing their users data on health and fitness. They measure, for instance, heart rates, record exercises and sleeping quality, and display burned calories. On Facebook, there are many activity tracker- and fitness-related groups. Why are users of activity trackers joining and consequently using such groups? In order to answer this basic question two theoretical approaches are adapted. Firstly, the *Uses and Gratifications Theory (U&GT)* identified gratifications, which are sought and obtained – in our case within those Facebook groups. Secondly, the *Self-Determination Theory (SDT)* is used to understand if the activities of users are caused by extrinsic or intrinsic motivations. For the purpose of this study an online survey was developed and distributed in 20 activity tracker- or fitness-related Facebook groups. All in all, data from 445 participants, who all are group members and are using an activity tracker, were evaluated.

**Keywords:** Activity tracker, Motivation, Gratification, Social media, Facebook, Uses and gratifications theory, Self-determination theory, Facebook groups

### 1 Introduction

In recent years activity trackers attract more and more the attention of researchers, especially within the Human Computer Interaction (HCI) community. They are not only focusing on technical improvements such as the enhancement of the measurement quality and the collection and visualization of the data [1–3], they are doing studies on user-based research related to the use and non-use of activity trackers as well [4–7]. Communities or rather the social online setting is less investigated related to activity trackers. According to Lee et al. [1] “products and services that promote health-related behavior, such as activity trackers, have increased dramatically in the market, little attention has been given to their social influences, such as social reinforcement from mediators.” Also Rooksby et al. [8] describe activity trackers as social tracking devices and not only as health devices collecting data. Lee et al. [1] show that “in social media, the participants tried to make ideal presentations of themselves and gain emotional support, such as attention and reputation, from their social media friends.” The social

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environment supports not only participant's improvement of health behavior, it enables the emotional support (relief and motivation), too [1]. Users of activity trackers regularly have the possibility to upload their activity records to Facebook. Fig. 1 shows that posts within Facebook groups can be diverse. The left part in Fig. 1 shows a discussion starting from a question. A Facebook user is searching after activity tracker-related information and received information by other users. The right part shows an overview (Fitbit dashboard) of succeed goals (steps, miles, active minutes and burned calories). User6 is self-presenting her-/himself by posting the succeed aims; and User6 got positive feedback from another Facebook user (User7).

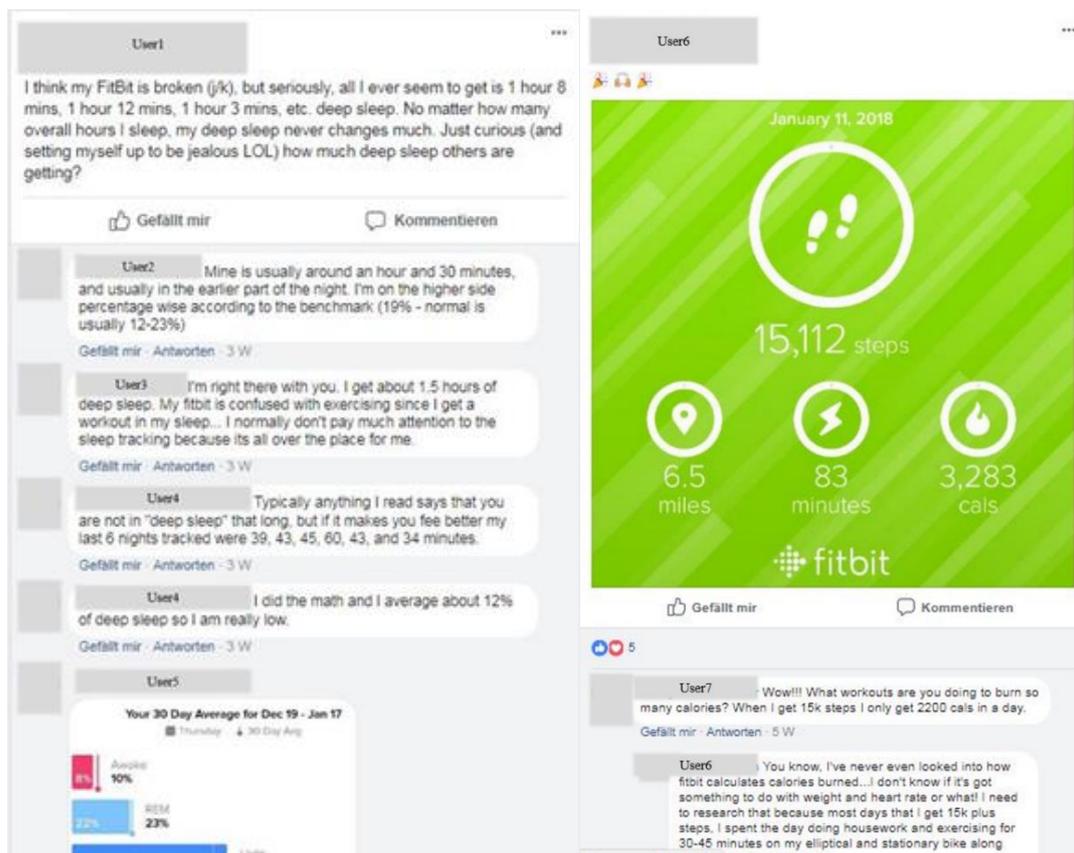


Fig. 1. Posts of a Facebook group (anonymized); left: User1 needs information; right: User6 realizes her-/himself (screenshot of a Fitbit dashboard).

Within Social Networking Services (SNSs), here, Facebook, we are able to identify numerous different fitness and health groups. Why do activity tracker- or rather fitness-orientated users cooperate with such Facebook groups if activity trackers provide functionalities that enable the improvement of health and fitness? Do they need the social reinforcement, competitions, information, entertainment, self-presentation or the motivation for the perseverance of fitness aims? To answer those questions the contribution is based on the *Uses and Gratifications Theory (U&GT)* and on the *Self-Determination Theory (SDT)*. The latter one “has increasingly become a basis for interventions in the areas of health promotion and physical activity” [9]. Ang, Talib, Tan, Tan, and Yaacob point out that *U&GT* is not sufficient to be able to comprehend why humans use and seek and obtain gratifications. Therefore, they used a mixed approach model (*U&GT and SDT*) for the analysis of online friendships [10]. We agree

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that for a deeper understanding of motivational reasons and needs the uses and gratifications theory supports the comprehension but is not per se sufficient or the only approach to understand completely the media use of individuals [10–12]. Therefore, our study combines the two theoretical frameworks (*U&GT and SDT*). The purpose of this study concentrates on the needs and motivational forces, why members of activity tracker- or fitness-related Facebook groups are using this SNS.

## 2 Theoretical Background: SDT and U&GT

Humans all over the world carry out activities caused by specific needs. The motivations to satisfy those needs have different backgrounds. The *Self-Determination Theory (SDT)* [9, 13–15] focuses on those backgrounds and point out that humans are doing something based upon intrinsic or extrinsic motivation. The former is limited to the activity itself. Individuals are doing something, because they are interested in it. There is no exterior influence or pressure. It is the activity itself which motivates individuals. The decision to do something is completely self-determined [13, 14]. Extrinsic motivation describes the situational condition that activities are done, because they are expedient or an instrument to reach some values originating from the environment [13]. Extrinsic motivation has four subcategories, namely *external regulation*, *introjected regulation*, *identified regulation* and *integrated regulation*. These subtypes (Table 1) are built related to the strength of autonomy (self-determination) from own values recognized in the environment to fully controlled through exterior influence [15]. *External regulation* means that a user joins a Facebook activity- or fitness-related group only, because others told him or her to do so. *Introjected regulation* is defined as the behavior to use those groups only out of the fact that other users and friends of

Table 1. Subtypes of extrinsic regulation [9, 14, 16].

Subtypes	Characteristics	Degree on Self-Determination
External	<ul style="list-style-type: none"> <li>• Punishment,</li> <li>• Controlled rewards,</li> <li>• Compulsion.</li> </ul>	Fully Controlled ● ○ ○ ○ Self-Determined
Introjected	<ul style="list-style-type: none"> <li>• Predetermined consequences,</li> <li>• Worth conscience,</li> <li>• Partial internalization.</li> </ul>	Fully Controlled ○ ● ○ ○ Self-Determined
Identified	<ul style="list-style-type: none"> <li>• Identification with external values.</li> </ul>	Fully Controlled ○ ○ ● ○ Self-Determined
Integrated	<ul style="list-style-type: none"> <li>• Own values are coherent with exterior values,</li> <li>• Self-Endorsement.</li> </ul>	Fully Controlled ○ ○ ○ ● Self-Determined

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activity trackers are using those groups, too. Otherwise, if they do not join and use them they get a worth conscience, because it seems as not supporting other participants. This kind of extrinsic regulation is “a partial internalization in which regulations are in the person but have not really become part of the integrated set of motivations, cognitions, and affects that constitute the self” [13]. Even if *identified regulation* is more self-determined than *introjected* and *external regulation* it is still the activity itself which is instrumentalized to gain something. “[I]f people identified with the importance of exercising regularly for their own health and well-being, they would exercise more volitionally” [13]. Here, *identified regulation* is defined as the importance to support and help other users of activity trackers, for example, to reach their aims by forcing the social solidarity or to answer questions. The strongest autonomous regulation related to the extrinsic subtypes is described as *integrated regulation*. It is still a kind of extrinsic motivation, because of the fact, that individuals are doing something “to attain separable outcomes rather than for their inherent enjoyment” [16]. Activities or adapted values conditioned by integrated regulation “have been evaluated and brought into congruence with one’s other values and needs” [16]. Besides individuals who are doing something out of intrinsic or extrinsic motivation, there are individuals who are not willing to do something. Ryan, Williams, Patrick, and Deci describe three different reasons why people are feeling *unmotivated*: (1) lack of skills or knowledge to do an activity, (2) missing coherence between activity and desired results, and (3) missing interest [9].

The *Uses and Gratifications Theory (U&GT)* is first used for traditional media channels and examines why people decide to use a medium and which “needs” should be satisfied [17–21]. This theory leads on Katz et al. [18,19]. *U&GT* is also applied to SNSs and other social media channels [22–24]. Hsu et al. [25] point out that social media and their popularity triggers a lot of research attention, especially for the better understanding why people decide to use it [25, 26]. Hsu et al. [25] showed that the motives why people use social media are divided in two categories: Firstly, psychological needs and gratifications [27–30] and secondly, social interaction [29, 31]. According to Quan-Haase and Young [32], the *U&GT* is one “of the more successful theoretical frameworks from which to examine questions of ‘how’ and ‘why’ individuals use media to satisfy particular needs.”

Therefore, *U&GT* stressed out “that users of media are active and goal-oriented” and that the selected medium depends on the satisfaction of those gratifications which satisfied the needs [25, 33]. The process of user’s media use begins with a social and psychological need [18]. Such human needs lead to user’s choice of a medium (e.g., Facebook) based on the expectation that the use of this medium can gratify the social and psychological need. Gratification is described as the behavior of seeking satisfaction of certain needs [34]. The satisfaction of certain needs, and therefore the motivation of using a specific medium, here Facebook activity tracker- or fitness-related groups, is based on the categorization related to McQuail [35], namely *information seeking, self-presentation, socialization, and entertainment*. Hsu et al. [25] show that a lot of researchers worked with the four categories in the context of social media [36–40]. Besides seeking of gratification, gratification can be obtained as well [41–43]. Palmgreen et al. point out that sought gratification and the obtained gratification are not always the same [43]. If an individual is searching for information he or

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she can obtain other aspects, too. The information content itself can be assumed entertaining as well. Additionally, the need of information can cause to keep in touch with other individuals to get specific information, too. Therefore, by searching information an individual can obtain social contacts (socializing) as well. Klenk et al. did research about fitness applications based on the theoretical framework of *U&GT* and *SDT* [44]. They found out that a combination of fitness applications with social media supports social gratifications [44]. “Sharing the results of physical activities via Facebook can provide social support through friends’ encouraging comments or their own status information, allowing the comparison of one’s own results with others” [44]. Furthermore, Park, Kee, and Valenzuela did already research Facebook groups’ user’s gratifications and found out that all needs, *U&GT* defines (seeking information, self-presentation, socialization, and entertainment) play an important role [30].

There is research on activity trackers, also related to motivational aspects, usefulness, ease of use, and gamification [4, 6, 7, 45–48]. But if one monitors the data of his/her activity tracker itself (e.g. steps, burned calories, heart rates), why does she/he participate in fitness-related Facebook groups? Our research idea includes four dimensions (D1–D4) (Fig. 2). The first dimension shows our target group, here, users of activity trackers. Based on the theory of *SDT* individuals are doing something out of intrinsic or extrinsic motivation (D2). “Something” is in this study defined as using Facebook related to activity tracker- or fitness-related groups (D3). To understand the needs of individuals who joins and uses those Facebook groups we applied *U&GT* and its four categories (D4).

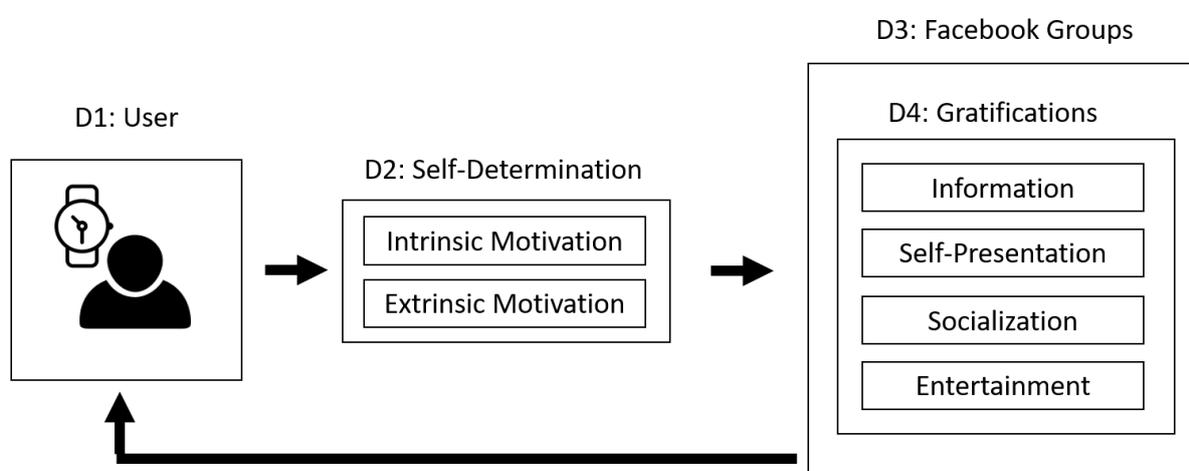


Fig. 2. Research model. (Model)

Based on our research model (Fig. 2), the study is going to answer the following research questions (RQs):

- RQ1: Which gratifications are sought and which are obtained?
- RQ2: Is there a correlation between sought and obtained gratifications?
- RQ3: Are users more intrinsically or more extrinsically motivated?
- RQ4: Do sought gratifications cohere with extrinsic or intrinsic motivation?
- RQ5: Do obtained gratifications support the use of activity trackers?

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### 3 Methods

This section describes the investigation's study design. It consists of the collection of quantitative data as outcomes of an online survey and the analysis of the quantitative data in order to answer the five research questions.

An online survey, with the help of eSurvey Creator<sup>1</sup>, was created with all in all 26 items. Some of those scale items could not adopt from previous studies as they do not apply *U&GT* and *SDT* to comprehend the general use of Facebook groups around health, fitness, activity trackers, weight loss, nutrition and similar topics. The items are formulated by having regard to the core characteristics of the mentioned two theories. Our online survey was divided into three sections. The first section covers demographic information (gender, age, country), activity tracker related information ('Do you have an activity tracker?', 'I have been using an activity tracker since: ...' and 'Without the Facebook group I would stop to use my activity tracker'), the type of user (producer, consumer, participant), testing item ('I'm currently a member of the following Facebook group: Name/Link') and a general free field for further comments. If participants answered the testing item with 'no' the survey was finished. The testing item was necessary to confirm that the participants are really a member of those Facebook groups.

The second section (see Appendix 1) examines the needs why users of Facebook groups use those activity- or fitness-related groups based on the *U&GT*. The theoretical framework considers both, gratifications sought and gratifications obtained. Participants having an activity tracker got the items (Appendix 1: #9–12), too. All items of the second section are equipped with a seven-point Likert scale, from 1 'It is absolutely not true', to 7 'It is absolutely true'. Participants got the possibility to choose "No Answer", too. The motives of the *U&GT* are completed by examples for the participants to support the easier understanding of each motive. The third section (see Appendix 2) deals with the *SDT*. Besides the intrinsic motivation (Appendix 2: #1), this section includes extrinsic motivation items (Appendix 2: #2–5) as well. The third section is equipped with the same seven-point Likert scale and the category "No Answer," too.

Before distributing the questionnaire, a pretest with five test persons was conducted to clarify discrepancies and vague descriptions. For German Facebook groups, the questionnaire was translated into German otherwise the questionnaire was in English.

The target group for this investigation is restricted. Only Facebook users who joined and use Facebook groups related to investigation's constrained topics come into consideration. Therefore, for each of the 20 analyzed Facebook groups the survey was duplicated with the only adaption of the testing question. Facebook groups such as 'Fitbit Charge 2 Group', 'Garmin vivosmart hr', 'Apple Watch', 'Freeletics Cologne', 'Fitbit For Women', 'Fitbit Weight Watchers Addict', 'Women-Fitness and Nutrition'<sup>2</sup> are examples where the survey was distributed. If one looks to some description of those Facebook groups one can find statements such as "let's post our accomplishments and met other fitbit users and change FITBIT ID'S. Let's form friendships [...] and motivate each other to move!!!", "Feel free to share recipes, ideas, photos of your

<sup>1</sup> <https://www.esurveycreator.com>.

<sup>2</sup> Translated from German: Frauen-Fitness und Ernährung.

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walks, celebrate stepping milestones or whatever else you want to discuss with the group [...]”, “This group is for women [...] here you can ask questions, post recipes, fitness successes, and so on”, “A group to discuss the Apple 1, 2 and 3 Series Watches! Post your questions, comments and pictures here!”. The frequency of members varies from around 300 to 34,000 members ( $\emptyset \sim 5,300$ ). On Facebook there are much more activity tracker- and fitness-related groups but only those are considered if their admins approved the distribution. A lot of Facebook groups did not allow the distribution of the questionnaire. There was no compensation for participants.

All in all, after data preparation 445 of 452 questionnaires, where participants affirmed the use of those groups, the using of activity trackers and completing the survey, are evaluable. The demographic data of our participants is shown in Table 2. As the data are not normally distributed, we worked with the Spearman-Rho correlation for identifying interrelationships between variables. The interpretation of the effect sizes are based on Cohen [49].

Table 2. Demographics of respondents.

Item	Answer	Frequency	Percent
Gender	Male	67	15%
	Female	375	84%
	I prefer not say	3	1%
Age	Silent Generation (1925–1945)	2	1%
	Baby Boomers (1946–1960)	26	6%
	Generation X (1961–1980)	184	41%
	Generation Y (1981–1998)	227	51%
	Generation Z (>1998)	6	1%
Country	Europe	368	84%
	North America	63	14%
	South America	1	0%
	Asia	7	2%
	Australia	6	1%
Operating time	N.A.	3	1%
	<2013	22	5%
	2014	30	7%
	2015	66	15%
	2016	105	24%
	2017	185	42%
	2018	34	8%
Without the group I would stop to use my activity tracker	Yes	3	1%
	No	442	99%

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### 4 Results

#### 4.1 Gratifications Obtained and Sought Within Activity Tracker and Fitness-Related Facebook Groups (RQ1)

Based on the description of some Facebook groups, participants have the possibility not only to search for information on activity tracker products, wristbands, exercises and recipes, they are also able to post images of weight loss before and after a diet, to post achievements, to search for friends and to be motivated through other users. Which of those aspects are the most preferred seeking ones? To determine the most sought and obtained motive we calculated statistical values such as median, mean and the standard derivation (the last two values only for additional information as the data is not normally distributed) (Table 3). The key motive why participants are using those Facebook groups is explained by the motive "Information" (Median: 6). At least half of our participants confirm that it is true that they use this group to receive information.

Table 3. Gratifications sought and obtained within activity tracker- and fitness-related Facebook groups.

Gratifications	Statistical Values	
	Sought	Obtained
Information	Median = 6 (IQR = 2) Mean = 5.86 ( $\pm 1.38$ ) N = 436	Median = 6 (IQR = 2) Mean = 5.62 ( $\pm 1.44$ ) N = 436
Self-Presentation	Median = 3 (IQR = 4) Mean = 3.17 ( $\pm 1.98$ ) N = 371	Median = 4 (IQR = 3) Mean = 3.69 ( $\pm 2.09$ ) N = 371
Socialization	Median = 4 (IQR = 4) Mean = 4.11 ( $\pm 2.01$ ) N = 399	Median = 4 (IQR = 3) Mean = 4.28 ( $\pm 2.00$ ) N = 399
Entertainment	Median = 4 (IQR = 3) Mean = 4.39 ( $\pm 1.71$ ) N = 418	Median = 5 (IQR = 2) Mean = 4.65 ( $\pm 1.69$ ) N = 418

Scale: 1 (It is absolutely not true) – 7 (It is absolutely true);  $\pm$  (Standard Deviation); IQR (Interquartile Range).

The possibility to realize oneself is the less preferred reason why users are using those groups (Median: 3). Participants reveal that it is not true that they are looking for the possibility to realize themselves. The receiving of achievements, to recognize one's successes (weight loss, stepping milestones) is one aspect, the need to sharing those successes with other, another. The participants do not deny that they occasionally use (Median: 4) those groups out of the fact that they seeking entertainment and socialization. Individuals who are searching for information can assume, based on the results, that they will receive needed information. They confirm that it is true that the use of the Facebook groups enables them to receive information (Median: 6). Conspicuously, while participants do not prospect the possibility to realize themselves more than half

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of participants state that they nevertheless posted successes occasionally (Median: 4). The Facebook groups try to be in general an informative platform, where users can satisfy their information needs related to activity tracker- or fitness-related topics. Participants agree (Median: 5) that it is rarely true that the use of those Facebook groups enables to feel entertained and to have fun. All in all, comparing the median values between gratifications sought and obtained, in two cases the experience (obtaining a gratification) is higher than the expectation (seeking a gratification), namely for self-presentation and for entertainment. Users do not explicitly seek for self-presentation and for entertainment; however, they get it.

### 4.2 Correlations Between Sought and Obtained Gratifications (RQ2)

Are there correlations between gratifications sought and obtained? Here, the correlations have to be interpreted always bidirectional. Table 4 shows the significance levels as well as the effect size. The effect size  $r = .10$  is characterized as low,  $r = .30$  as medium and  $r = .50$  as strong. Based on the results there are nearly in all cases significant correlations between gratifications sought and obtained.

Participants obtained the gratification they sought (and – of course – vice versa). When a user seeks for information, she/he obtains information (.669\*\*\*); looking for self-presentation, the participant gets it (.649\*\*\*); hoping of socialization, it indeed happens (.686\*\*\*); and finally, seeking entertainment is correlated with obtaining entertainment (.698\*\*\*). All are strong and statistically highly significant correlations.

Table 4. Bivariate rank correlation (Spearman's rho) between gratifications sought and obtained.

		Gratifications Obtained			
		Information	Self-Presentation	Socialization	Entertainment
Gratifications Sought	Information	.669*** (N = 436)	.050 (N = 370)	.099 (N = 395)	.179*** (N = 414)
	Self-Presentation	.035 (N = 432)	.649*** (N = 371)	.359*** (N = 394)	.165*** (N = 412)
	Socialization	.189*** (N = 436)	.460*** (N = 374)	.686*** (N = 399)	.328*** (N = 416)
	Entertainment	.216*** (N = 437)	.272*** (N = 374)	.445*** (N = 399)	.698*** (N = 418)

Significance values: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

The seeking for a certain gratification results in many cases in obtaining different additional gratifications as well. Seeking for information correlates lowly with entertainment, but not with self-presentation and socialization. Seeking for self-presentation correlates with socialization with a medium effect and with entertainment (however,

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only on a low level). Looking for socialization, it correlates with all other gratifications obtained, namely information (low effect size), entertainment (medium effect size) and self-presentation (medium effect size). If one seeks for entertainment, she/he obtains except of entertainment itself information (low effect size), self-presentation (low effect size) and socialization (medium effect size).

### 4.3 Users' Intrinsic and Extrinsic Motivations (RQ3)

In fact, participants of activity tracker- or fitness-related Facebook groups are using them based mainly on intrinsic motivation (Median: 6) (Table 5). More than half of the participants confirmed that they like it to join those groups and that they do not have any external expectations by joining and doing something within this group. Nobody is compelling the users to join and use those groups (external regulation: Median: 1; introjected regulation: Median: 1).

Two extrinsic motivational factors have some influence, but both are tending to be self-determined. Participants tell that it occasionally happens that they use those groups because they identify with the values and behavior of those groups (identified regulation; Median: 4). Participants confirm that those values are occasionally coherent with the individual's own values and behavior (integrated regulation; Median: 4).

Table 5. Use of Facebook groups caused by intrinsic and extrinsic motivation.

Item	Statistical Values
Motives, why I use this Facebook group:	
Intrinsic Motivation	Median = 6 (IQR = 3) Mean = 5.31 ( $\pm$ 1.54) N = 439
External Regulation	Median = 1 (IQR = 0) Mean = 1.23 ( $\pm$ 1.05) N = 439
Introjected Regulation	Median = 1 (IQR = 0) Mean = 1.26 ( $\pm$ 1.05) N = 438
Identified Regulation	Median = 4 (IQR = 4) Mean = 3.89 ( $\pm$ 2.02) N = 424
Integrated Regulation	Median = 4 (IQR = 3) Mean = 3.54 ( $\pm$ 1.85) N = 383

Scale: 1 (It is absolutely not true) – 7 (It is absolutely true);  $\pm$  (Standard Deviation); IQR (Interquartile Range).

### 4.4 Motivational Background of Sought Gratifications (RQ 4)

What is the motivational background of sought gratification (Table 6)? We would like to know which kind of motivation (intrinsic or extrinsic) is prevalent with the four

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defined gratification categories (information, self-presentation, socialization, and entertainment). The negative correlation delivers that the interpretation of the correlation of two data is contrary. If people are seeking for information within those Facebook groups, it does not correlate positively with external ( $-.149^{**}$ ) and introjected regulation ( $-.137^{**}$ ). If people would be compelled to use those groups or they would have a bad conscience it is not founded by the need to seek information.

Table 6. Correlations between intrinsic and extrinsic motivations and sought gratifications.

		Subtypes of Extrinsic Regulation				
		Intrinsic	External	Introjected	Identified	Integrated
Gratifications Sought	Information	.250*** (N = 434)	-.149** (N = 433)	-.137** (N = 432)	.105* (N = 420)	.090 (N = 380)
	Self-Presentation	.032 (N = 430)	.186*** (N = 430)	.233*** (N = 429)	.326*** (N = 418)	.319*** (N = 378)
	Socialization	.123* (N = 434)	.084 (N = 434)	.122* (N = 433)	.476*** (N = 421)	.435*** (N = 381)
	Entertainment	.263*** (N = 433)	.030 (N = 433)	.078 (N = 432)	.303*** (N = 420)	.259*** (N = 381)

Significance values: \* $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

The more people using those groups, because they are looking for the possibility to receive information the more it is intrinsically (.250\*\*\*) motivated. Searching for self-presentation does not significantly correlate with the intrinsic motivation, but with extrinsic subtypes (external: .186\*\*\*; introjected: .233\*\*\*; identified: .326\*\*\*; integrated: .319\*\*\*). If the decision to use a Facebook group is controlled through looking for the possibility to socialize it exists a significant strong correlation between socialization and identified regulation (.476\*\*\*) as well as with integrated regulation (.435\*\*\*). The more the intrinsic motivation or the introjected and identified regulations (extrinsic motivation) is predominant the more participants are seeking for entertainment.

### 4.5 Gratifications Supporting the Use of Activity Tracker (RQ5)

The study shows that participants do not really need the Facebook groups to continue the use of their activity trackers. 99% of our participants mentioned that they would not stop to use the activity tracker without the use of those groups. Based on the possibility to obtain the chance to receive information, to socialize and to be entertained participants agree that it is indifferent that it supports the use of their activity trackers

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(Median: 4) (Table 7). Self-presentation via a Facebook group does not support the use of an activity tracker (Median: 3).

Table 7. Gratifications and the use of activity trackers.

Item	Statistical Values
The use of your activity tracker is supported by...	
Information	Median = 4 (IQR = 4) Mean = 4.11 ( $\pm$ 2.02) N = 427
Self-Presentation	Median = 3 (IQR = 4) Mean = 3.35 ( $\pm$ 2.07) N = 368
Socialization	Median = 4 (IQR = 3) Mean = 3.78 ( $\pm$ 2.06) N = 391
Entertainment	Median = 4 (IQR = 3) Mean = 4.01 ( $\pm$ 1.91) N = 399

Scale: 1 (It is absolutely not true) – 7 (It is absolutely true);  $\pm$  (Standard Deviation); IQR (Interquartile Range).

## 5 Discussion

The objective of this study was to find out why users of activity trackers are additionally applying activity tracker- or fitness-related Facebook groups. To answer this basic question, the study was based on two approaches: the *U&GT* and the *SDT*. A survey, designed following the basic principles of these two theories, was developed and distributed within different Facebook groups. One main point is to work out the sought and obtained gratifications (information, self-presentation, socialization, entertainment) and the satisfaction related to obtained gratifications. The second main point is to comprehend why Facebook users are tending to do something. Are their activities or their needs to look for gratifications caused by intrinsic or extrinsic motivation?

The demographic values show that participants have not had their activity tracker for too long. Half of 445 participants own their activity trackers since 2017. To the starting time of using a new device (here activity trackers), normally, users need information, for example, related to the ease of use and meaning of measured values (active minutes, sleeping phases). The study shows that an exchange of information is ensured. Within those Facebook groups the information need can be satisfied.

Functionalities of an activity tracker such as step milestones, calories burned, active minutes, sleeping phases are working without social support. But, challenges with other users of activity trackers, obviously, assume that users need other users. Individuals are not equal. Some individuals do not need social reinforcement; they are their own

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support and motivation. However, there are also individuals who need the support, the feedback, the emotional reinforcement to keep motivated. Facebook groups, which include descriptions like “Let’s form friendships” focus on those values and are suited for those individuals.

The participants do not have the need to share their successes in Facebook groups. They are not looking for the possibility to realize themselves by posting and sharing achievements, step milestones, and so on. Indeed, it is assumed that the behavior of other users within those Facebook groups (posting of success), the group description, for example, “Feel free to share recipes, ideas, photos of your walks, celebrate stepping milestones” or invocations of admins to share successes are contagious. Likewise, participants are feeling more entertained in those Facebook groups as they expected. To sum up, based on the *U&GT* the study confirmed that participants are getting exactly or more than expected what they are seeking for in those groups.

Besides the fact, that participants obtained their sought gratifications, the correlations show that looking for the possibility to satisfy ones’ need, for example, receiving information, enables also to feel entertained. Participants who are using those groups for seeking self-presentation obtained the chance to socialize, too. This is accounted by the fact that sharing or posting successes is an activity itself. But, the support through positive feedback and emotional support or compliments does not work without other users. The possibility to get to know other users, to feel motivated through the general social reinforcement can reduce participants fears to feel ashamed and strengthens the user’s self-confidence. Generally, the analysis of evaluated data states that not always the sought gratification enables the obtaining of other gratifications and vice versa. Participants who look for self-presentation do not obtain information.

Those Facebook groups are not necessary for the continued use of activity trackers. 99% of participants argue that they would not stop to use their activity tracker without those groups. Considered the fact that an activity tracker is a device that enables the self-quantification by showing up the measured aspects, there is no Facebook group needed to get to know how many steps a user did. But, it is recognizable that the possibility to receive information, to socialize and to feel entertained sometimes support the use of the activity tracker. If someone would like to know how he or she can track an exercise the Facebook group can provide an answer and therefore support the use of the activity tracker. Individuals’ social environment does not necessarily have an activity tracker. But without other users there is no possibility to start challenges. Mentioned Facebook groups enable to find other friends or, here, competitors for challenges; this supports the continued use of the activity trackers furthermore. Besides receiving information, feeling entertained and to socialize, self-presentation within those groups is rarely a factor that leads to the support of using activity trackers.

To sum up, the continued use of an activity tracker itself is depending on its own functionalities. Other studies show that the impact and ease of use of activity trackers have an influence on the use as well. However, sometimes the support of the Facebook groups in different ways should be considered as supporting aspect, too, but not as a necessary aspect.

Individuals are doing activities or decisions out of intrinsic or extrinsic motivation. Participants of this study provide the fact that seeking information within those groups is caused through one’s own intrinsic motivation without any extrinsic influences.

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Here, the need to seek information is not induced by external or introjected regulation. Descriptions of Facebook groups “Post and share your experiences, recipes, pictures and so on” encourage users of the group to post something. Self-presentation is caused through subtypes of the extrinsic regulation. Users who share their successes out of identified regulations agree with the values of the group, here to support each other, to share successes and to motivate other persons. Participants who are looking for socialization identify with the rules of the groups. It is important to support other users, to exchange experiences, to meet new users and to give feedback. Participants are not compelled to meet other people or to support each other. The more participants are seeking for entertainment the more this need is caused by their own motivation and the activity itself (to have fun). Beyond that, to seek for entertainment can be caused by identified and integrated regulation (extrinsic motivation) as well. The feeling of being entertained is triggered regularly through different conditions, for example, other users who try to create a funny atmosphere while sharing and chatting with other users. Especially admins try to convey a space of respect but with facility and humor. Based on the evaluated data, it is not possible to indicate for each sought gratification a type of motivation. Instead it is either intrinsic as extrinsic, too.

Ultimately, both theories *U&GT* and *SDT* enable an answer and an understanding of gratifications and motivations why some people are using activity tracker- and fitness-related Facebook groups. The understanding of the chosen shared successes or the kind of postings assume a deeper study with, for example, a content analysis. Which kind of successes users are posting? Health metrics such as calories burned, step milestones, average heart rates, etc. or pictures before and after a diet?

This study has some weak points. Over the entire analysis it should be at the back of one’s mind that the groups are not consistent over all. The criteria which Facebook group could be used in this study was depended on the permission of admins and the topic. However, for a first comprehensive analysis of the role of those Facebook groups beside the devices themselves the study enables significant insights.

### Appendix 1: Questions Concerning Uses and Gratifications Theory

#		Item
	U&GT: Sought Gratifications	I use this Facebook group, because I’m looking for the possibility ...
1		... to receive information
2		... to realize myself (e.g., to show my success, aims and obtained achievements)
3		... to socialize (e.g., for being motivated, for challenges, and emotional reinforcement)
4		... to be entertained (e.g., to have fun)
	U&GT: Obtained Gratifications	The use of the Facebook group actually enables me ...
5		... to receive information

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#		Item
6	U&GT: Obtained Gratifications	... to realize myself (e.g., to show my success, aims and obtained achievements)
7		... to socialize (e.g., for being motivated, for challenges, and emotional reinforcement)
8		... to be entertained (e.g., to have fun)
	Support of Activity Tracker	The use of your activity tracker is supported by ...
9		... receiving information within this Facebook group
10		... self-realization (e.g., to show my success, aims and obtained achievements) within this Facebook group
11		... socialization (e.g., for being motivated, for challenges, and emotional reinforcement) within this Facebook group
12		...entertainment (e.g., to have fun) within this Facebook group

### Appendix 2: Questions Concerning Self-Determination Theory

#		Item
		Motives, why I use Facebook groups:
1	Intrinsic Motivation	I like to use Facebook groups like this one. I don't have any external expectations.
2	Extrinsic Motivation: External Regulation	I was required (compelled) to use this group. I had no choice.
3	Extrinsic Motivation: Introjected Regulation	I use this group, because otherwise I would have a bad conscience as my circle of friends and acquaintances use groups like this one.
4	Extrinsic Motivation: Identified Regulation	I identify with the aims and behavior of this group and adapt them (e.g., the support of others). I'm agreeing with these practices and values.
5	Extrinsic Motivation: Integrated Regulation	The values and practices of the group are coherent with my own values and practices. I completely adapt them.

### References

- Lee, Y., Kim, M.G., Rho, S., Kim, D., Lim, Y.: Friends in activity trackers: design opportunities and mediator issues in health products and services. In: Proceedings of IASDR, pp. 1206–1219 (2015)
- Choe, E.K., Lee, N.B., Lee, B., Pratt, W., Kientz, J.A.: Understanding quantified-selfers' practices in collecting and exploring personal data. In: Proceedings of the SIGCHI Conference Human Factors Computing Systems - CHI 2014, pp. 1143–1152 (2014). <https://doi.org/10.1145/2556288.2557372>

## The final authenticated version is available online

at [https://doi.org/10.1007/978-3-319-91485-5\\_4](https://doi.org/10.1007/978-3-319-91485-5_4)

3. Fan, C., Forlizzi, J., Dey, A.: Considerations for technology that support physical activity by older adults. In: Proceedings of 14th International ACM SIGACCESS Conference Computer Accessibility - ASSETS 2012, pp. 33–40 (2012). <https://doi.org/10.1145/2384916.2384923>
4. Ilhan, A., Henkel, M.: 10,000 steps a day for health? User-based evaluation of wearable activity trackers. In: Proceedings of the 51st Hawaii International Conference on System Sciences, pp. 3376–3385. IEEE Computer Society, Washington, DC (2018)
5. Giddens, L., Leidner, D., Gonzalez, E.: The role of fitbits in corporate wellness programs: Does step count matter? In: Proceedings of the 50th Hawaii International Conference on System Sciences, pp. 3627–3635. IEEE Computer Society, Washington, DC (2017)
6. Gao, Y., Li, H., Luo, Y.: An empirical study of wearable technology acceptance in healthcare. *Ind. Manag. Data Syst.* 115, 1704–1723 (2015). <https://doi.org/10.1108/IMDS-03-2015-0087>
7. Fritz, T., Huang, E.M., Murphy, G.C., Zimmermann, T.: Persuasive technology in the real world: a study of long-term use of activity sensing devices for fitness. In: Proc. of the SIGCHI Conference on Human Factors in Computing Systems - CHI 2014, pp. 487–496. ACM, New York (2014)
8. Rooksby, J., Rost, M., Morrison, A., Chalmers, C.: Personal tracking as lived informatics. In: Proceedings of the 32nd Annual ACM conference on Human factors in computing systems - CHI 2014, pp. 1163–1172 (2014). <https://doi.org/10.1145/2556288.2557039>
9. Ryan, R.M., Williams, G.C., Patrick, H., Deci, E.L.: Self-determination theory and physical activity: the dynamics of motivation in development and wellness. *Hell. J. Psychol.* 6, 107–124 (2009). <https://doi.org/10.1080/17509840701827437>
10. Ang, C.S., Abu Talib, M., Tan, K.A., Tan, J.P., Yaacob, S.N.: Understanding computer-mediated communication attributes and life satisfaction from the perspectives of uses and gratifications and self-determination. *Comput. Hum. Behav.* 49, 20–29 (2015) <https://doi.org/10.1016/j.chb.2015.02.037>
11. Ko, H., Cho, C.-H., Roberts, M.S.: Internet uses and gratifications: a structural equation model of interactive advertising. *J. Advert.* 34, 57–70 (2005)
12. Ryan, R.M., Rigby, C.S., Przybylski, A.: The motivational pull of video games: a self-determination theory approach. *Motiv. Emot.* 30, 347–363 (2006). <https://doi.org/10.1007/s11031-006-9051-8>
13. Deci, E.L., Ryan, R.M.: The “what” and “why” of goal pursuits: human needs and the self-determination of behavior. *Psychol. Inq.* 11, 227–268 (2000). [https://doi.org/10.1207/S15327965PLI1104\\_01](https://doi.org/10.1207/S15327965PLI1104_01)
14. Ryan, R.M., Deci, E.L.: Intrinsic and extrinsic motivations: classic definitions and new directions. *Contemp. Educ. Psychol.* 25, 54–67 (2000). <https://doi.org/10.1006/ceps.1999.1020>
15. Deci, E.L., Ryan, R.M.: *Intrinsic Motivation and Self-Determination in Human Behavior*. Plenum Press, New York (1985)
16. Ryan, R.M., Deci, E.L.: Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am. Psychol.* 55, 68–78 (2000). <https://doi.org/10.1037/0003-066X.55.1.68>
17. Kippax, S., Murray, J.P.: Using the mass media: need gratification and perceived utility. *Communic. Res.* 7, 335–359 (1980). <https://doi.org/10.1177/009365028000700304>
18. Katz, E., Blumler, J.G., Gurevitch, M.: Uses and gratifications research. *Public Opin. Quart.* 37, 509–523 (1973–1974)
19. Katz, E., Blumler, J.G., Gurevitch, M.: Utilization of mass communication by individual. In: Blumler, J.G., Katz, E. (eds.) *The Uses of Mass Communications: Current Perspective on Gratifications Research*, pp. 19–32. Sage, Beverly Hills CA (1974)
20. Palmgreen, P., Rayburn, J.D.: Uses and gratifications and exposure to public television: a Discrepancy Approach. *Commun. Res.* 6, 155–180 (1979). <https://doi.org/10.1177/009365027900600203>
21. Rubin, A.M.: Television uses and gratifications: the interactions of viewing patterns and motivations. *J. Broadcast.* 27, 37–51 (1983). <https://doi.org/10.1080/08838158309386471>
22. Flanagin, A.J.: IM online: instant messaging use among college students. *Commun. Res. Reports* 22, 175–187 (2005). <https://doi.org/10.1080/00036810500206966>
23. Larose, R., Mastro, D., Eastin, M.S.: Understanding Internet usage: a social-cognitive approach to uses and gratifications. *Soc. Sci. Comput. Rev.* 19, 395–413 (2001). <https://doi.org/10.1177/089443930101900401>
24. Leung, L.: College student motives for chatting on ICQ. *New Media Soc.* 3, 483–500 (2001)

## The final authenticated version is available online

at [https://doi.org/10.1007/978-3-319-91485-5\\_4](https://doi.org/10.1007/978-3-319-91485-5_4)

25. Hsu, M.-H., Chang, C.-M., Lin, H.-C., Lin, Y.-W.: Determinants of continued use of social media: the perspectives of uses and gratifications theory and perceived interactivity. *Inf. Res.* 20 (2015). [http://www.informationr.net/ir/20-2/paper671.html#\\_Wu4AXSP5wgo](http://www.informationr.net/ir/20-2/paper671.html#_Wu4AXSP5wgo)
26. Kim, Y., Sohn, D., Choi, S.M.: Cultural difference in motivations for using social network sites: a comparative study of American and Korean college students. *Comput. Hum. Behav.* 27, 365–372 (2011). <https://doi.org/10.1016/j.chb.2010.08.015>
27. Lee, C.S., Ma, L.: News sharing in social media: the effect of gratifications and prior experience. *Comput. Hum. Behav.* 28, 331–339 (2012). <https://doi.org/10.1016/j.chb.2011.10.002>
28. Dunne, Á., Lawlor, M., Rowley, J.: Young people's use of online social networking sites – a uses and gratifications perspective. *J. Res. Interact. Mark.* 4, 46–58 (2010). <https://doi.org/10.1108/17505931011033551>
29. Li, D.C.: Online social network acceptance: a social perspective. *Internet Res.* 21, 562–580 (2011). <https://doi.org/10.1108/10662241111176371>
30. Park, N., Kee, K.F., Valenzuela, S.: Being immersed in social networking environment: facebook groups, uses and gratifications, and social outcomes. *Cyberpsychol. Behav.* 12, 729–733 (2009). <https://doi.org/10.1089/cpb.2009.0003>
31. Pempek, T.A., Yermolayeva, Y.A., Calvert, S.L.: College students' social networking experiences on Facebook. *J. Appl. Dev. Psychol.* 30, 227–238 (2009). <https://doi.org/10.1016/j.appdev.2008.12.010>
32. Quan-Haase, A., Young, A.L.: Uses and gratifications of social media: a comparison of Facebook and instant messaging. *Bull. Sci. Technol. Soc.* 30, 350–361 (2010). <https://doi.org/10.1177/0270467610380009>
33. Sangwan, S.: Virtual community success: a uses and gratifications perspective. In: Proc. 38<sup>th</sup> Hawaii Int. Conf. Syst. Sci, pp. 193c. IEEE Computer Society, Washington, D.C. (2005)
34. Rosengren, K.E.: Uses and gratifications: a paradigm outlined. In: Blumler, J.G., Katz, E. (eds.) *The Uses of Mass Communications: Perspectives on Gratifications Research*, pp. 269–286. Sage, Beverly Hills (1974)
35. McQuail, D.: *Mass Communication Theory: An Introduction*. Sage, London (1983)
36. Shao, G.: Understanding the appeal of user-generated media: a uses and gratification perspective. *Internet Res.* 19, 7–25 (2009). <https://doi.org/10.1108/10662240910927795>
37. Chen, G., Yang, S., Tang, S.: Sense of virtual community and knowledge contribution in a P3 virtual community. *Internet Res.* 23, 4–26 (2013). <https://doi.org/10.1108/10662241311295755>
38. Papacharissi, Z., Mendelson, A.: Toward a new(er) sociability: uses, gratifications and social capital on Facebook. In: Papathanassopoulos, S. (ed.) *Media Perspectives for the 21<sup>st</sup> Century*, pp. 212–213. Routledge, New York (2011)
39. Boyle, K., Johnson, T.J.: MySpace is your space? examining self-presentation of MySpace users. *Comput. Hum. Behav.* 26, 1392–1399 (2010). <https://doi.org/10.1016/j.chb.2010.04.015>
40. Ellison, N.B., Steinfield, C., Lampe, C.: The benefits of facebook "friends:" social capital and college students' use of online social network sites. *J. Comput. Commun.* 12, 1143–1168 (2007). <https://doi.org/10.1111/j.1083-6101.2007.00367.x>
41. Greenberg, B.S.: Gratifications of television viewing and their correlates for British children. In: Blumler, J.G., Katz, E. (eds.) *The Uses of Mass Communications: Current Perspectives on Gratifications Research*, pp. 195–233. Sage, Beverly Hills (1974)
42. Katz, E., Haas, H., Gurevitch, M.: On the use of the mass media for important things. *Am. Sociol. Rev.* 38, 164–181 (1973)
43. Palmgreen, P., Wenner, L.A., Rayburn, J.D.: Relations between gratifications sought and obtained: a study of television news. *Commun. Res.* 7, 161–192 (1980). <https://doi.org/10.1177/009365028000700202>
44. Klenk, S., Reifegerste, D., Renatus, R.: Gender differences in gratifications from fitness app use and implications for health interventions. *Mob. Media Commun.* 5, 178–193 (2017). <https://doi.org/10.1177/2050157917691557>
45. Giddens, L., Leidner, D., Gonzalez, E.: The role of Fitbits in corporate wellness programs: does step count matter? In: Proceedings 50th Hawaii International Conference on System Sciences, pp. 3627–3635. IEEE Computer Society, Washington, D.C. (2017)
46. Clawson, J., Pater, J.A., Miller, A.D., Mynatt, E.D., Mamykina, L.: No longer wearing. In: Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing - UbiComp 2015, pp. 647–658 (2015)
47. Shin, G., Cheon, E.J., Jarrahi, M.H.: Understanding quantified-selfers' interplay between intrinsic and extrinsic Motivation in the use of activity-tracking Devices. In: iConference, pp. 45–47 (2015)

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**at [https://doi.org/10.1007/978-3-319-91485-5\\_4](https://doi.org/10.1007/978-3-319-91485-5_4)**

48. Ledger, D., McCaffrey, D.: Inside wearables: how the science of human behaviour change offers the secret to long-term engagement (2014). <https://blog.endeavour.partners/insidewearable-how-the-science-of-human-behavior-change-offers-the-secret-to-long-termengagement-a15b3c7d4cf3>
49. Cohen, J.: Statistical Power Analysis. Lawrence Erlbaum, Hillsdale (1988)