

# Recommendation Systems as Technologies of the Self: Algorithmic Control and the Formation of Music Taste

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## Abstract

The article brings to light the use of recommender systems as technologies of the self, complementing the observations in current literature regarding their employment as technologies of ‘soft’ power. User practices on the music recommendation website last.fm reveal that many users do not only utilize the website to receive guidance about music products but also to examine and transform an aspect of their self, i.e. their ‘music taste’. The capacity of assisting users in self-cultivation practices, however, is not unique to last.fm but stems from certain properties shared by all recommendation systems. Furthermore, unlike other oft-studied digital/web technologies of the self which facilitate ‘self-publishing’ vis-à-vis virtual companions in social media, recommender algorithms themselves can act as ‘intimate experts’, accompanying users in their self-care practices. Thus, recommendation systems can facilitate both algorithmic control and creative self-transformation, which calls for a theorization of this new cultural medium as a space of tension.

## Keywords

algorithms, care of the self, Foucault, last.fm, online music recommendation, recommendation systems, technologies of the self

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## Introduction

In recent years, recommendation systems have become an essential part of our techno-cultural landscape. Today, all major websites offer recommendations to their users. This development has not gone unnoticed and, along with their economic significance, sociological and political implications of recommender systems have come under critical scrutiny. Researchers were quick to observe that, given their capacity for shaping the information flow between users and their cultural environment (Gillespie, 2014: 167; Morris, 2015) as well as guiding the activities and preferences of users (Beer, 2009; Cheney-Lippold, 2011; Hallinan and Striphas, 2014), recommender algorithms can function as *technologies of control*.

These pioneering works provide invaluable insights about *how recommender systems can exert control over users*. But we still know little about *how users utilize these systems in practice*. We initiated this study to complement the existing observations in the literature by shifting the focus of research in this direction, which we began by delving into the experiences of the users of the music recommendation website *last.fm*. A striking observation during this preliminary research, however, has given the study a new turn. While, as expected, users utilized *last.fm* to receive guidance about music products, they *also* used it as a tool for modifying their listening practices. More specifically, many users experienced *last.fm* as a kind of ‘companion’, with the help of which they could transform an aspect of their self (i.e. their ‘music taste’).

In light of this observation, we realized that the concept of ‘technologies of the self’ – which, to use Foucault’s (1997a: 225) oft-cited definition, ‘permit individuals to effect . . . a certain number of operations on their own . . . conduct and way of being, so as to transform themselves’ – could be handy in capturing a significant dimension of the users’ interaction with *last.fm*. Indeed, as our inquiry progressed, we recognized that this potential stemmed from certain properties that all recommendation systems share. Our first objective, then, is *to bring to light the use of recommender systems as technologies of the self*, complementing the observations about their capacity for algorithmic control.

Moreover, we also aim to contribute to the recent literature on *digital/web technologies of the self*. So far, the pioneering studies in this field have predominantly focused on the practices of ‘self-publishing’ in social media (Abbas and Dervin, 2009; Aycock, 1995; Bakardjieva and Gaden, 2012; Haider, 2015; Rettberg, 2014; Sauter, 2013; Siles, 2012). As we shall see, however, since recommendation systems act more like ‘companions’ than self-publishing tools, they constitute *a different type of digital technology of the self than social media*. Finally, the most theoretically significant contribution of the study lies in revealing the potential of this new cultural medium to facilitate *both* algorithmic control *and* creative self-transformation, which we elaborate on in the conclusion.

## The Conceptual Framework

### Recommendation Systems

Since recommendation systems could not have been possible without recommender *algorithms*, these two terms are often used interchangeably. This, however, does not mean that such systems can be reduced to a mere code but should rather be seen as a *complex assemblage of information exchange consisting of multiple elements and processes*. Although their design can be based on different computational paradigms,<sup>1</sup> ultimately all recommender systems gather data about particular characteristics (e.g. interests, tastes, or curiosities) of an individual user and, on the basis of that data, offer information and services specifically tailored for that user.

The origin of recommender algorithms is often traced back to a practical/economic problem in online delivery systems. Offline information and product delivery has a limited scope (e.g. the number of books an offline store can carry is physically limited). In offline establishments, therefore, there is usually a pre-selection process that prioritizes the items with broad *public relevance*. Virtual delivery systems, in contrast, can offer an almost unlimited amount of information, which ‘forces online institutions to recommend items to *individual users*’ (Leskovec et al., 2014: 309; emphasis added). Recommender systems, therefore, can be seen as a product of ‘algorithm providers’ attempts to thoroughly know and predict their users’ (Gillespie, 2014: 168), in order to deliver more ‘personalized’ information for ‘customer satisfaction’. Thus, as is already observed in the literature on search engines (e.g. Hargittai, 2007; Halavais, 2013), such algorithms can act as critical mediators that shape the communication between users and their cultural ecosystem (Gillespie, 2014: 167), exercising power by excluding/including and organizing cultural information (Morris, 2015: 451). Furthermore, by combining this ‘mediatory power’ with algorithmic personalization, recommender systems can also function as technologies of control that guide their users’ activities and, thereby, constitute the technical basis of a system of ‘soft’ power (Beer, 2009; Cheney-Lippold, 2011; Hallinan and Striphos, 2014; Morris, 2015). Beer (2009: 997) explicates that this ‘soft’ power is not a matter of ‘someone having power over someone else, but of the software making choices and connections . . . in order to shape the everyday experiences of the user’.

As also noted in some of these studies, however, we know little about how users experience/utilize these systems. This question is particularly important for elucidating what Gillespie (2014: 168) calls the *entanglement of algorithms with practice* – a notion that has important parallels with similar, though broader, concepts in Science and Technology Studies literature such as ‘co-construction of users and technology’ (Oudshoorn and Pinch, 2003) or ‘co-emergence of subjects and objects’

(Day, 2011). What these concepts underline is that, in practice, users neither passively submit to the guidance/control of algorithms, nor remain completely unaffected; the effects that an algorithm can produce on users are co-constructed through ongoing ‘negotiations’ between the two.

If one crucial implication of this entanglement, then, is that *the effects of algorithms can be reshaped through user practices*, the other is that *‘users reshape their [own] practices to suit the algorithms they depend on’* (Gillespie, 2014: 168; emphases added). And, as users try to modify their own practices, they go through various processes of self-reflection and transformation. In short, a recommender system does *not only* mediate users’ relation to their socio-cultural environment but it might *also* mediate their *relation to themselves*, which brings us to our next topic.

### *Technologies of the Self*

Introduced to the current literature through Foucault’s later works, this concept has been a major source of inspiration for the recent studies on digital/web technologies of the self. Here, we shall dwell on two points that are directly relevant for our concerns.<sup>2</sup>

As is well-known, in his later works, Foucault (1990a, 1990b, 1993, 1997a, 2005) gradually shifted his attention from the question of how subjects are produced in knowledge-power networks to how human beings turn *themselves* into subjects, through *practices of the self*. ‘Practices of the self’, however, are not solipsistic endeavours but require complex assemblages comprising discourses, other people (e.g. disciples and teachers), institutions (e.g. schools or monasteries), meditative techniques as well as a whole range of tools (e.g. letters and diaries). It is such assemblages – and not just technical artefacts – that Foucault (1997b) delineates by ‘technologies of the self’ (see also Brenninkmeijer, 2010). As we shall see, recommendation systems too constitute such an assemblage.

Secondly, Foucault (1990a, 1990b) qualifies practices of the self as *ethical* because they are utilized to give an ‘ethos’ – i.e. a ‘character’ or ‘style’ – to one’s existence. More specifically, he conceptualizes technologies of the self as one of the four crucial dimensions of an ethical self-formation practice. Namely, a technology of the self is used by individuals: (i) to work on a particular aspect of their self (‘ethical substance’); (ii) with a view to give this aspect an ultimate form (‘telos’); and (iii) within the framework of historically variable ‘modes of subjectivation’, denoting whether such practices are carried out to conform to existing norms or to forge a ‘new aesthetics of existence’.

Foucault primarily focuses on the latter option in his later work, delineating the historical uses of self technologies in the constitution of

certain areas of one's life (e.g. diet or sex) as 'substances' of ethical care as well as aesthetic elaboration. As such, 'care of the self' does not just target *what* one thinks but is rather an *askesis* that aims to change *how* one lives and conducts oneself through self-disciplinary labor (Foucault, 1990b, 2005). We largely adopt this conceptual scheme here. 'Music taste', we shall suggest, constitutes an 'ethical substance' for some last.fm users, which they try to 'improve' with the help of the recommender system. The 'collaborative work' of users with the recommender system, however, does not only bring about a change in *what* they listen to but also in their *conduct as music listening subjects*. In other words, it is by mediating the users' relation to their own conduct, and not only to musical products, that recommender systems function as self technologies.

Current studies on digital/web technologies of the self also pay close attention to the capacity of digital media to induce a self-reflective attitude in users (e.g. Abbas and Dervin, 2009; Aycock, 1995; Bakardjieva and Gaden, 2012; Haider, 2015; Rettberg, 2014; Sauter, 2013; Siles, 2012). So far, however, these pioneering studies have investigated this capacity in reference to *personalized uses of social media*, focusing predominantly on *social networking sites, weblogs, micro-blogs, news groups and forums, and 'virtual worlds'*. These types of social media, it is argued, enable users to experiment with various forms of 'self-writing' or 'self-publishing', giving way to practices of self-discovery, self-mastery and self-care (Aycock, 1995; Bakardjieva and Gaden, 2012; Boellstorff, 2008; Haider, 2015; Rasmussen, 2014; Siles, 2012). The key to the use of such media as self technologies lies in their capacity to facilitate *novel types of encounters between the self and others*, 'be they companions in virtual worlds..., readers (for example, of a blog), listeners (Podcasts), or viewers (YouTube, Dailymotion)' (Abbas and Dervin, 2009: 2).

The insights of these studies, however, are not directly applicable to recommender systems, which are not primarily designed to facilitate self-other encounters in virtual space. Although, especially in the case of *collaborative filtering*, recommendations offered to a particular user are based on the data gathered from others (Jannach et al., 2010; Leskovec et al., 2014), this 'mediation' does not entail any actual interaction between the users. Indeed, other users become almost completely indiscernible in this process as their data are 'assimilated' by the algorithmic system, which acts as their spokesperson. Unlike in personalized social media, then, it is the self-algorithm interaction that matters most in this case. To grasp how recommender systems function as self technologies, therefore, we need to direct our attention to this interaction.

### *How Can a Recommendation System Function as a Technology of the Self?*

A recommender system collects data about users, organizes that data into a meaningful form and makes recommendations. A closer look at these three operations is essential for understanding how such a system can function as a technology of the self. First, although some applications ask users to manually enter data about themselves, this is usually considered a tedious and unreliable method (Jannach et al., 2010). In most cases, a recommender algorithm ‘learns’ about its users by accessing the data about their previous online or offline activities. This means that a recommendation system does not record an already delineated characteristic of the user but, rather, it is through the operations of the system that this ‘characteristic’ is *constituted* and brought to the attention of users (see, for example: Hallinan and Striphas, 2014: 8–10).

Secondly, recommender systems can also incite users to reflect on this constructed characteristic because they respond to every activity/preference of users with a new set of recommendations. As Beer and Burrows (2013: 60) point out, this can be seen as ‘recursive feedback of data’, which ‘has a constitutive affect on people’s lifeworlds’. This ‘affect’, we shall suggest, is both exhilarating and exciting because the flow of recommendations demands endless self-reflection from users, while offering them ever new possibilities for transforming their characteristics. And, lastly, since users can influence their ‘profiles’ by modifying their activities, such systems also accompany users in this self-transformation process and mediate their relation to what appears to them as an ‘objectified’ aspect of themselves.

To recapitulate, we can imagine a hypothetical user who is initially engaged in sporadic online or offline activities. Once the data about these activities are loaded into a recommender system, however, they assume a specific form, signifying a ‘characteristic’ of the user. Next, recommendations begin to pour in, alluding to new activities/items that might be of interest to the user, and thereby invite the user to revise his/her current choices/characteristics. Finally, the user can go back to the starting point and attempt to modify his/her activities in light of these revisions. And, as this cycle keeps on repeating, users develop new ideas about themselves as well as new practices.

Let us, however, immediately note that recommender systems are employed in numerous different domains, where the above-mentioned properties often have no practical significance. Many commercial websites, for example, are designed to make one-time recommendations. In many others, user data and ‘profiles’ are not fully accessible to users. Nevertheless, some systems in current use do exhibit all the properties discussed above, as is the case with the empirical focus of this study.



## Last.fm: Methodological Remarks and the Analysis of Findings

We focus on last.fm because the forums on the website provide abundant qualitative data about user practices – a characteristic that most other popular recommendation sites lack. Our main data source is the comments of users in forums. Since these are unsolicited expressions of users' experiences, they are particularly valuable for us. As a type of social media, however, the forum environment also sets certain limits to user narratives. Forum comments usually come in pieces and bits, and tend to be influenced by the 'atmosphere' of specific forum groups. To compensate for this limitation, we also conducted ten in-depth interviews with last.fm users. While the interview environment is more 'artificial' in comparison to forums, it involves less social pressure and provides ample time and space to interviewees for narrating their experiences.<sup>3</sup> This helped us to gather detailed information especially about the *use of specific last.fm functions* like the scrobbler, statistical tools, recommendations and social-networking channels (see Appendix 1) and complemented our findings from forum discussions regarding the three processes that allowed users to utilize the website to cultivate their music taste:

- (i) the process through which users' 'music taste' becomes objectified;
- (ii) the ways in which users reflect on this objectified taste with the help of recommendations;
- (iii) the strategies they employ to modify their taste and listening practices.

Before proceeding with this analysis, several methodological remarks are in order. First, although *music* can be used as a technology for care (DeNora, 1999) or control (Anderson, 2015) of the self, the question of *how last.fm users make use of music* remains beyond the scope of our analysis. The object of our inquiry is *not the care (or control) of the self through music* but the role played by a recommender system in *the care of music taste as an aspect of the self*.

Secondly, we offer no prior definition of 'music taste' because our aim is to show *how 'music taste' emerges* as a significant aspect of the user's self and how it becomes an object of care *through* his/her interactions with last.fm. We attribute no essence to 'music taste' beyond this construction.

Third, we do not consider forum participants as a 'representative sample' but as a sub-set of the last.fm population, consisting of users who are particularly devoted to their relationship with the website. The same can be said about our respondents, all of whom have been long-term users of last.fm. The 'non-generalizable' nature of our data, however, is not an essential limitation because our question is not whether *all* last.fm users employ the website to care for their music taste, but whether user practices involve *some evidence* indicating such a potential.

### *The Scrobbler and the Library: Giving 'Music Taste' a Visible Form*

The first stages of users' interaction with last.fm as a recommendation system can be depicted in terms of a basic demand and a corresponding offer. 'Tell us about your music taste', last.fm says, 'and we'll give you great recommendations'.

But how does one 'tell about' one's 'music taste'? In practice, last.fm's demand is fulfilled by users by downloading the program named 'scrobbler' to their digital music playing devices. The scrobbler is designed to transmit the data about the music listening activities of users to their 'libraries' in their last.fm profiles. In effect, it is this individualized music library that is supposed to signify the 'music taste' of a user.

It would, however, be quite misleading to think that one can 'tell' about one's music taste simply by scrobbling since the information recorded by the scrobbler goes through a series of transformations: the songs 'scrobbed' at diverse points by a user are first arranged neatly in the form of a library, which is *then* interpreted as the representation of the user's music taste. The library, therefore, is *not* the expression of a *pre-given* 'music taste'. Rather, this 'taste' gains a *visible form* when the myriad of scrobbles are combined in the library. Contrary to what the last.fm message – 'tell us about your music taste' – seems to suggest, therefore, it is *the library* that *tells users* about *their* music taste.

Turning to the experience of users, the first point we should note is that the scrobbler is akin to a wearable technology that accompanies users and, as such, its 'presence' is amply felt. This finds one of its most vivid expressions in a group titled, *People who have an Obsessive Scrobbling Syndrom* [sic.], with over 2650 members and numerous discussion threads.<sup>4</sup> In one of those threads, users share their experience when there is a technical problem with the scrobbler such that their lists are not updated properly. Here are some highlights:<sup>5</sup>

I start feeling like an incomplete person. And I get really depressive.  
(remco)

I begin to panic. These songs HAVE to be in my charts. I feel incomplete. . . . There's just something that makes me have to scrobble EVERY song, really creepy. When I was on holiday a few weeks ago I could not take my iPod with me, because it was broken. The whole holiday I listened to CDs on my old discman . . . But! These songs would not be scrobbed!!! So when I came home, I, immediately turned on my iTunes and played all night songs which I listened to on my holiday . . . That's how far my obsession goes.  
(Taralita)



The emphasis on ‘feeling incomplete’ in these comments implies that these users consider the ‘data’ transferred to their libraries through scrobbling as a *part of themselves*. ‘[T]he scrobbling data on my profile is *important to me*’, writes one user (DirtyG),<sup>6</sup> while another insists that ‘[an] unscrobbed song is like a wasted song’ (understanding0).<sup>7</sup> Users conceive their ‘scrobbles’ as a valuable *personal property*, so much so that some employ dedicated scripts to regularly save them.

This value, we should stress, does not simply derive from the fact that users can ‘present’ their libraries in a public platform – this is *not a social media effect*. Rather, the *preservation* of the scrobbling ‘data’ remains a *matter of concern* for many users because they *themselves* can ‘look at’ it and discern something there about their own ‘taste’:

[When last.fm fails to update properly,] I lose my will to listen to music because what’s the point really, if you can’t obsessively look at the stats afterwards. (pecusita)<sup>8</sup>

It is a widespread practice among last.fm users to utilize their libraries to overview their listening history and generate statistics about their daily scrobbles.<sup>9</sup> They treat such statistics as an index of their music listening habits. Some, for example, worry that their daily scrobbles are too few: ‘[I have] [a]round 40-50 scrobbles a day. Real figure of tracks listened to is probably higher. . . . Just 3 years ago I didn’t have the amount of available internet connection as I do now’ (mat35).<sup>10</sup> Conversely, those who listen to over 100 tracks per day sometimes complain of having jobs where they are chained to the desk – or, having nothing else to do.

Moreover, the library also includes information about the *kinds* of music/artists listened to the ‘top lists’ of the user, and the diversity or the ‘coherence’ of the overall collection. This gives the library a symbolic character, which calls for a rather intricate interpretive process. Here are some examples of how users elaborate on what gives ‘unity’ to the otherwise hard-to-interpret patterns in their libraries:

If you look at [my library in different phases of my life], there will always be something uniting. For example, I don’t know, when I was a kid, . . . there would always be this kind of ‘rebel’ towards society element in it. . . . But then [more recently], I would always look at something that calms me down. So, the music that I listen to right now, . . . is usually something more joyful . . . (Intw#3)

I’d like to listen to stuff that has refined instrumental parts and are relatively demanding in terms of rhythm and melody. I mean . . . even if they are from very different genres, I can listen to songs that involve unusual [rhythmic] measures. (Intw#4)

Users, then, often treat their library as a kind of musical mirror. A recommender system, however, is not merely a ‘mirroring’ device. As we shall see in the next section, as soon as an ‘image’ in this mirror appears, the recommender algorithm kicks in, stopping it from assuming a frozen form and urging the users to consider other possibilities.

### *Beyond the Library: Recommendations and ‘Music Taste’ as an Object of Care*

In a recommendation system, the information in users’ libraries is not only scrutinized by them. It is also fed into an algorithm that continuously recommends new items to the user. As one user puts it, it is as if the algorithm says, ‘if you really like this [song], I’ll give you others that you might like even more’ (Intw#2).

In effect, the recommendation algorithm on last.fm offers an *interpretation* of the library, which does not just specify what the present music taste of the user *is*, but also what it *can be*. Thus, last.fm recommendations perpetually hint at a ‘world’ beyond the existing boundaries of a user’s library. There is considerable evidence that users employ this ‘guidance’ not only to discover new music but also to revise and modify their *current* ‘music taste’.

One obvious effect of recommendations is to sensitize users to the ‘quantitative’ aspects of their ‘music taste’. Thus, typically, one user answers the thread, ‘What makes you happy?’<sup>11</sup> with ‘finally reaching 1000 artists in my library’ (Wothsthedeal), while another ‘confesses’ perpetually sampling ‘boring’ music. More importantly, new recommendations often motivate users to change their *listening practices* to give their ‘music taste’ a new form. One user, for example, stressed that when he noticed he listened to certain musicians ‘excessively’, he forced himself to listen to other artists (Intw#4). Similarly, another noted:

I become attentive to what I listen to too little and what genres escape from my sight [and] in order to keep my musical perception wide, I turn to these [new kinds of music]. (Intw#5)

We shall see other examples in a moment, but already here we might begin to discern that as their interaction with last.fm unfolds, users’ ‘music taste’ come to growingly resemble, to use Foucault’s (1990b) terminology, an ‘ethical substance’ – namely, an aspect of their self that they *care* about and feel the need to *work upon*. They become keen on giving this ethical substance a desirable form, so much so that some delete their existing library and start building a new one.

But what exactly is this ‘desirable form’? Does last.fm provide a ‘telos’ for this process? Clearly, recommendations do not specify what ‘good’ music is *in general*, but what *could be* good for the *individual* user.

Nevertheless, the condition of constantly receiving recommendations creates a tendency in the users to care about the *diversity* of the music they listen to:

Last.fm has changed me. Made me too self-conscious of my listening habits. Before, I'd play the same artist for days and days, but now I constantly struggle to diversify. I recently made a playlist called 'diversify!', it contains a lot of artist[s] that are close to my top 50, and I'd like to see them on my profile page. (pecusita)<sup>12</sup>

We might, then, perhaps say that the implicit 'ethical imperative' of last.fm's recommender system is: 'diversify your music taste'. It is this aim that seems to inform the 'work' of users on their music taste. Indeed, exposure to diverse musical items is actively pursued by many users who, finding the recommendations on last.fm insufficient, have even formed a separate 'recommendation system' within last.fm.<sup>13</sup>

Strictly speaking, however, diversification is anything but an unambiguous 'telos'. The perpetual flow of recommendations ensures that diversification is never completed but remains an *endless* pursuit. As one forum contributor asks: 'How do I get it so that my supposed "taste" in music becomes more diverse (as in I want to listen to EVERYTHING)?' (Alkajak).<sup>14</sup> For, indeed, how does one build a perfectly diverse library if not by scrobbling all music ever created?

We shall therefore suggest that the pursuit of diversity, accompanied by the constant flow of recommendations, calls for a virtually endless *care and cultivation of 'music taste'*. In fact, some users perceive 'indeterminacy' as the trademark of their 'music taste':

I do not have a definite music taste, I have an indefinite music taste (giggling) . . . Frankly, I have a still changing music taste. That's the sense in which there is a general ambiguity [in my library]. (Intw#5)

Similarly, many users feel that their libraries are always in the making and their 'music taste' is ever open to 'improvement'.

Last.fm, then, functions as a technology of the self, not by urging users to interiorize a definite musical 'content', but by inviting them to modify their listening habits through recommendations. User comments indicate that in the absence of the recommender system, one might enjoy music without much concern about, say, how often one listens to the same song or how diverse the artists one listens to are. It is, in other words, by encouraging a change in this 'careless' *conduct of the user* as a music-listening subject that the recommender system plays a role in self-transformation. This, moreover, implies an *askesis* because 'music taste' is now perceived as the outcome of an *activity* – besides enjoying music one also listens to it with a view to improve one's 'music taste'.

Thus, many users comment that they feel caught up in an endeavour that requires constant effort, which they nevertheless find exciting. The following remarks can give us a good glimpse of the peculiar ‘lifeworld’<sup>15</sup> of these users:

I’ve been trying to diversify my musical taste...you get into the trap of finding more and more genres, and then you get overwhelmed. But it’s awesome! (BossHossV8Bikes)<sup>16</sup>

This ‘trap’, it can be argued, is essentially an algorithmic feedback circuit and, like other ‘personalizing’ algorithms discussed by Pariser (2011), it has the potential to create a ‘filter bubble’ around individual users, progressively isolating them into ever narrower cultural niches. However, the complaints of last.fm users were not about isolation but about ‘being overwhelmed’. This does not necessarily mean there is no ‘filter bubble’ in last.fm. It does, however, imply that users often *experience* this bubble as a ‘trap’ not because it is closed but because it remains open-to-change due to the constant flow of recommendations. Our findings therefore partly overlap with Nguyen et al.’s (2014: 677) observation that, when users consume recommended items, they ‘experience lessened narrowing effects’.

More generally, one might ask how much novelty a recommender system can offer. While most current systems propose items similar to users’ previous choices, attempts to develop algorithms that can offer substantial novelty and serendipity already exist (Morozov, 2011; Shapira et al., 2011). In any case, our findings suggest that, even when users are incorporated into an algorithmic control circuit, this does not necessarily stop them from getting excited about cultivating their characteristics (like ‘music taste’) in new ways. We shall discuss the broader implications of this observation in the conclusion.

### *Recommendation Systems and Social Media: A Complex Co-existence*

Many users, then, employ last.fm to reflect on and cultivate their music taste, which attests to the potential of recommendation systems to function as technologies of the self. However, we do not claim that this is the only use of last.fm. The forums indicate much variation in user practices, one major reason for which is that *last.fm is not only a recommendation system* but also has a social media component allowing users to publicly share their libraries (see Baym and Ledbetter, 2009). One might expect these two components to reinforce each other since, as is widely observed, visibility in social media makes internet users self-reflective. Such a simple correlation, however, is disputed in recent studies that underline the complex effects that algorithms have on social aggregation/disaggregation (Totaro and Nino, 2016). In any case, it would be

quite misleading to frame last.fm merely as a platform for ‘presentation of the self’s music taste’.

Indeed, the availability of social media channels on last.fm often leads users to employ the tools on the website for quite different ends than cultivation of music taste. Most notably, some users try to *impress others* by scrobbling songs that they do not actually listen to. The occurrence of such ‘fake scrobbling’ is common knowledge among last.fm users and openly debated in the forums of two rival groups: ‘true listeners’,<sup>17</sup> who only scrobble when they listen to music, versus ‘untrue listeners’,<sup>18</sup> who say that they are ‘proud’ of doing the opposite. These debates reveal a striking tension between users who employ the *recommendation system for self-cultivation* purposes and those who employ the *social media component for self-presentation* – though these are not necessarily mutually exclusive tendencies. It is, for example, quite difficult to say whether the following user is actually ‘manipulating’ the system to impress others or genuinely modifying his listening practices:

sometimes i feel like I’m cheating on my top artists, for instance when I’ve discovered a new (to me) band and listen to them 24/7 so they’ll be in my top 20 in no time and kick some other artist out that i might have been listening to for ten years. (las\_cruces\_jail)<sup>19</sup>

More generally, it can be argued that the presence of social media channels *complicates* the algorithmic processes in recommender systems in several ways. Firstly, we can talk about a kind of ‘rivalry’ between these two components because social media channels too can be used for making recommendations (which is very common in last.fm). Secondly, while recommender algorithms never directly ‘like’/‘dislike’ users’ preferences, such emotionally-loaded evaluations are widespread in social media. This sometimes augments the effects of algorithmic recommendations. For example, one last.fm user writes to another: ‘you should start diversifying your taste as soon as possible otherwise nobody will consider you a real music fan!’ (C26000).<sup>20</sup>

However, equally emotional appeals in the forums can also give way to the formation of identities around quite peculiar musical orientations. One forum group, for instance, invites users not so much to ‘enrich’ their library but to embrace a ‘random and questionable musical taste’.<sup>21</sup> This means social media channels enable users to invent various criteria for evaluating ‘music taste’, which differ considerably from the criteria used by the recommender algorithm. Finally, whereas a recommender algorithm allows users to interact with itself only as individuals, social media channels render these users visible *as a public* and give them a voice vis-à-vis the platform. In last.fm’s forums, for example, users critically discuss *the characteristics of the platform itself* and even demand modifications.<sup>22</sup> Thus, last.fm’s social media channels can give way to a ‘co-constitution’

process between the platform and its public – a trend that Van Dijck (2013) has already observed in other contexts.

All this, however, does not mean that the contents produced in social media are immune to algorithmic processing. As Gerlitz and Helmond (2013) note, for example, through the current integration of social media to the ‘Like economy’, the emotional content of user comments tends to be translated into ‘machine-readable’ quantitative data. Thus, rather than positing a sharp contrast between ‘humanly’ social media versus ‘cold-blooded’ algorithms, we propose to see this as a complex co-existence.

As a corollary, it is worth noting that whereas social media channels assume a person-to-person communication, which traditionally has been the main mode of sharing cultural information (Kayahara and Wellman, 2007; Williams, 2006), the design motto of recommender algorithms is often formulated as providing ‘better recommendations than humans’ (Jannach et al., 2010: xiv). But what exactly might ‘better’ mean here? Granted, the algorithmic system has access to ‘bigger’ data than human actors. But suggesting that this is sufficient for determining, say, the ‘taste’ of a flesh-and-blood user amounts to assuming that ‘information’ as ‘some mysterious entity is responsible for imbuing people and objects with shape, quality or character’ (Striphas, 2015: 407). We do not think that the term ‘better’ is warranted in *this* sense. What we can say, however, is that, *in conjunction with their utilization as self technologies, recommender systems also offer a distinct type of ‘companionship’ to their users*, which we consider next.

### **Recommender Systems as ‘Intimate Experts’**

Given that not all websites adopting a recommender algorithm are equally amenable to being used as self technologies, one might think that last.fm is exceptional, particularly due to its specific focus on ‘music taste’ and the scrobber. However, neither of last.fm’s qualities is extraordinary. In the last few years, we have witnessed the emergence of highly sophisticated ‘wearable devices’ that can collect data about our daily activities (Gilmore, 2015), of which the scrobber is a prototypical example. Thus, beyond ‘music taste’, many other characteristics of users, from their intellectual orientations to physical health, can be processed by recommender algorithms. Indeed, in addition to other music recommendation sites (e.g. Spotify), this is already happening on remarkably diverse types of platforms that offer recommendations for dating (Match.com, OkCupid); social connections (Facebook, Twitter); news (e.g. Google-News); movies/videos (Netflix, YouTube); and professional networking (LinkedIn and ResearchGate). More generally, the basic capabilities (i.e. objectifying a specific characteristic of the user and providing tools for revising and altering it) which enable last.fm to function



as a technology of the self can potentially be employed by most recommender systems.

Highlighting the employment of recommender systems as technologies of the self, however, is not just a matter of drawing attention to an ‘interesting’ phenomenon. This observation is important also because, unlike other digital technologies of the self that facilitate ‘self-publishing’, recommender systems are not mediators between the self and others in virtual space. Rather, as devices of continuous and dynamic information exchange, they have a capacity to form intimate and permanent bonds with their users, *accompanying* them in their various affairs.

To understand what is truly novel about this configuration, we need to turn to Foucault’s later works (1990a, 1990b, 2005) again, which often draw attention to the essential role that intimate partners (friends or spiritual companions) played in ancient practices of the ‘care of the self’. It was through a constant dialogue with these partners that individuals pursuing a ‘philosophical life’ induced a change in their lives. With the emergence of more institutionalized relations in Christianity, however, such partnerships (and along with them ancient ‘arts of existence’) began to lose their significance. And, with the rise of modern bio-politics, they are largely replaced by ‘experts’ like doctors, psychologists, dieticians and so on.

Nevertheless, Foucault (1984, 1997a) also detects a powerful critical vein in modern culture, which casts doubts over the authority of both institutionalized religion and experts and which, therefore, can trigger a search for new ethical practices – though he has not said much about what specific forms these new practices might take and whether they might involve new kinds of ‘partnerships’. This brings us to the question of whether recommender systems can constitute such new ‘partners’. After all, given their capacity to incite self-reflection in their users and offer them ‘guidance’, they resemble both spiritual companions and experts (they are indeed classified as ‘expert systems’). At the same time, however, they differ from both in important respects. Unlike spiritual companionships, which have a ‘holistic’ and emotionally demanding nature, relations with recommender systems are more focused on specific traits. Conversely, unlike professional experts who are expected to treat their ‘clients’ objectively and within limited time frames, recommender systems are designed to form ‘personalized’ and long-lasting relations with their users. As such, it might be quite pertinent to conceptualize them as a cross between the two, as ‘intimate experts’.

It is worth noting here that recommender systems *are* sometimes perceived like a new kind of companion by users. Thus, some users praise last.fm for – literally – *knowing* them so well, while many others are thankful to it for *helping* them to enrich their music taste. Moreover, they often compare last.fm and their friends as two different types of ‘recommenders’. But perhaps most strikingly, during our analysis of

last.fm forums, we noticed that users often expressed a desire for sharing *all their personal musical experiences* with the system. Indeed, they have even formed a dedicated group titled, *We Want Scrobbling Everywhere*.<sup>23</sup> The comments of the following user from this group imply a degree of ‘intimacy’ that can possibly be observed only in few real life companionships:

[E]very media you watch/listen to should be scrobbled indeed . . . Maybe every song I sing in my head should be scrobbled! (freakyy\_87)

Some users, then, perceive the recommender system as an ‘authority’ as well as a ‘trustable’ partner. Thus, if in ‘motivating’ users to change their habits, and offering them hard-to-reach information, they can be compared to experts and teachers, in acting as trusted ‘recipients’ of their personal experiences, they seem to play a role akin to ‘friends’ and companions.

Finally, to explicate a point we could only briefly hint at so far, the ‘mediation’ and ‘companionship’ functions of recommender systems go hand in hand. Last.fm’s recommender system, for example, mediates users’ relation to their ‘music taste’. But it is as a ‘lasting companion’ that it facilitates *the continuation of this self-relation and the work of users on their ‘music taste’*. The capacity of recommender systems to act as ‘companions’, therefore, is essential for their continuous use as self technologies.

## Conclusion

Although in light of this exploratory inquiry we cannot ascertain whether recommender systems *will* become our intimate experts, what we can maintain is that they are currently knocking at our door, asking to be our companions.

But what kind of companions would they turn out to be, if accepted? Could they, for example, expedite new ethical self-practices in Foucault’s (1984: 50) sense, accompanying their users in developing a critical attitude towards current forms of subjectivity and experimenting with new ways of existence? Or, given their well-known articulation as technologies of control, will they permeate our lives as agents of soft power? These are probably the most challenging questions that can be drawn from this study and, ultimately, they boil down to whether recommender systems should be portrayed as facilitating the *control or care of the self*.

At first sight, it might seem that we could propose an answer to this question by investigating whether last.fm moulds the ‘music taste’ of its users in particular ways. As we have seen, however, last.fm does not orient its users towards a *definite* ‘taste’. Rather, its effect can best be

described as constant ‘disorientation’, as today’s recommendations are quickly displaced by new ones tomorrow. This is not only valid for last.fm. More generally, as types of ‘software making choices and connections in complex and unpredictable ways’ (Beer, 2009: 997), recommender algorithms are ‘highly-fluid’ and ‘always unknowable’ (Morris, 2015: 459).

These observations render possible two very different interpretations. The ‘open’ nature of this interaction can be seen as generating a space of freedom in which one can experiment with new ways of self-cultivation. But as Deleuze (1992) points out in his essay on ‘societies of control’, such perpetual modulation can also be conceived as exercise of power (see also Cheney-Lippold, 2011). Most notably, the endless/recursive nature of the process creates a state of *dependency*, as vividly exemplified by last.fm users’ devotion to ‘scrobbling’ and eagerness for new recommendations.

It can therefore be argued that one way in which recommender systems exercise control over users is by inducing a desire in them for constantly transforming themselves. Conversely, however, it can also be argued that the very functioning of such systems *presupposes* the willingness of users to cultivate themselves in new ways. After all, what would a recommender system matter without some curiosity and desire for novel experiences? One can even talk about a symbiotic relationship here. If the constant flow of recommendations is what motivates users to continue their interaction with the system, the ever incomplete and evolving profile of a user is what prompts the recommender algorithm to resume its operations.

This is where we might begin to discern that the capacity of recommender systems to function as instruments of control does not exclude the possibility of their employment as technologies of the self. One might therefore be tempted to erase the contrast between ‘control’ and ‘care’ of the self posed above. It is, however, crucial to note that such an erasure assumes the viewpoint of a ‘second-degree observer’, looking at the user-algorithm interaction from outside. Seen from within – e.g. seen from the viewpoint of users – this contrast might not be entirely meaningless. Rather, such a perspective urges us to consider the possibility that this new cultural medium might eventually become a permanent field of tension. Our findings already indicate that users tend to respond to the demands of recommender algorithms in diverse ways and even make ‘counter-demands’ through social media channels. In the foreseeable future too, both the users and designers of such systems will probably react to the ‘control’ effects of these systems in different ways, putting more *or* less emphasis on their capacity to function as spaces of experimentation and self-cultivation. Our aim in this article was to shed light on this latter capacity and its possible implications. Clearly, we cannot bring a closure to the question of its future uses here, though we do hope that our findings will stimulate further interest in that question.

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## Notes

1. Most notably: collaborative filtering, content- and knowledge-based approaches, and various hybrid applications. See Jannach et al. (2010); Shapira et al. (2011).
2. For extensive reviews see: Karakayali (2015); McGushin (2007); Willcocks (2006).
3. The interviews were conducted face-to-face with two interviewers present and lasted on average 30 minutes. All informants recruited to this study were 'acquaintances of acquaintances' – a method we adopted to balance trust and anonymity. Most informants were in their mid-20s and the age range was 22 to 32. The informants were recruited from a university milieu that includes international students and, with one exception (a teacher), all informants were university students (undergraduate or postgraduate). A key criterion in the selection of interviewees was long-term involvement with last.fm.
4. OSS: People Who Have an Obsessive Scrobbling Syndrom (2008). Available at: <http://www.last.fm/group/OSS:+People+Who+Have+An+Obsessive+Scrobbling+Syndrom> (all last.fm sources cited hereafter were last accessed on 17 November 2015).
5. Who Are You? (Who, Who? Who, Who?) (2008) Discussions. Available at: [http://www.last.fm/sv/group/OSS:+People+Who+Have+An+Obsessive+Scrobbling+Syndrom/forum/94437/\\_/411039](http://www.last.fm/sv/group/OSS:+People+Who+Have+An+Obsessive+Scrobbling+Syndrom/forum/94437/_/411039)
6. Is last.fm dead? (2015) Available at: [http://www.last.fm/forum/21717/\\_/2238941/1](http://www.last.fm/forum/21717/_/2238941/1) (emphasis added).
7. See: <http://www.last.fm/group/We+want+scrobbling+everywhere#shoutbox>
8. We want scrobbling everywhere (2007). Available at: [http://www.last.fm/sv/group/OSS:+People+Who+Have+An+Obsessive+Scrobbling+Syndrom/forum/94437/\\_/411039](http://www.last.fm/sv/group/OSS:+People+Who+Have+An+Obsessive+Scrobbling+Syndrom/forum/94437/_/411039)
9. There are also various plug-ins and labs, whereby users can determine, for example, their 'level of music addiction' (<http://stas.sh/lastfm/>).
10. How many tracks do you listen to on average per day? (2008) Discussions. Available at: [http://www.last.fm/tr/forum/5/\\_/373749/38](http://www.last.fm/tr/forum/5/_/373749/38)
11. What makes you happy? (2014) Discussions. Available at: [http://www.last.fm/fr/forum/5/\\_/2232620/14](http://www.last.fm/fr/forum/5/_/2232620/14)
12. OSS: People Who Have an Obsessive Scrobbling Syndrom (2008). Available at: [http://www.last.fm/group/OSS:+People+Who+Have+An+Obsessive+Scrobbling+Syndrom/forum/94437/\\_/411039](http://www.last.fm/group/OSS:+People+Who+Have+An+Obsessive+Scrobbling+Syndrom/forum/94437/_/411039)
13. Music Advice Centre (2006). Available at: [http://www.last.fm/group/Music+Advice+Center/forum/40095/\\_/172885](http://www.last.fm/group/Music+Advice+Center/forum/40095/_/172885)
14. See: [http://www.last.fm/forum/21713/\\_/677600?lang=fr](http://www.last.fm/forum/21713/_/677600?lang=fr)
15. See: Beer and Burrows (2013: 60).
16. See: <http://www.last.fm/user/BossHossV8Bikes>
17. True Listener (2004) Available at: <http://www.last.fm/group/True+Listener>

18. Untrue Listener and proud of it! (2006) Available at: [http://www.last.fm/group/Untrue+Listener/forum/35795/\\_/133367](http://www.last.fm/group/Untrue+Listener/forum/35795/_/133367)
19. OSS: People Who Have an Obsessive Scrobbling Syndrom (2008) Available at: [http://www.last.fm/sv/group/OSS:+People+Who+Have+An+Obsessive+Scrobbling+Syndrom/forum/94437/\\_/411039](http://www.last.fm/sv/group/OSS:+People+Who+Have+An+Obsessive+Scrobbling+Syndrom/forum/94437/_/411039)
20. See: [http://www.last.fm/group/I+Hate+Music+Snobs/forum/66529/\\_/374965](http://www.last.fm/group/I+Hate+Music+Snobs/forum/66529/_/374965)
21. See: <http://www.last.fm/group/This+is+a+group+with+random+and+sometimes+questionable+musical+taste+for+people+who+are+weird+or+bored>
22. See: [http://www.last.fm/pt/forum/34905/\\_/2239688/29](http://www.last.fm/pt/forum/34905/_/2239688/29) for a forum where such demands are raised.
23. We want scrobbling everywhere (2007) Available at: <http://www.last.fm/group/We+want+scrobbling+everywhere#shoutbox>

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## Appendix I: Main Parts of the Interview Questions

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Key Themes	Questions (summary format – follow up and elaboration questions are not included)
'Music taste' and the last.fm library.	<ul style="list-style-type: none"> <li>● Could you tell us a little bit about the kinds of music you like? (Do all these appear in your last.fm library?)</li> <li>● Last.fm asks users to 'tell about their music taste'. What do you think about this concept?</li> <li>● Do you think your library on last.fm is representative of your music taste?</li> <li>● Do you think by looking at people's libraries on last.fm we can learn something about their music taste and attitude towards music?</li> </ul>
The <i>general</i> impact of last.fm on music taste.	<ul style="list-style-type: none"> <li>● Has your involvement with last.fm changed anything in your music taste or your attitude towards music?</li> </ul>
The impact of <i>specific</i> functions of last.fm.	
The scrobber:	<ul style="list-style-type: none"> <li>● Do you feel a difference when you listen to music with the scrobber?</li> <li>● Do you sometimes scrobble a song without listening to it?</li> </ul>
Statistics:	<ul style="list-style-type: none"> <li>● Do you make use of last.fm statistics? (If yes, for what purpose?)</li> </ul>
Recommendations:	<ul style="list-style-type: none"> <li>● What do you think about the recommendations offered to you by last.fm? . . .</li> <li>● You told us earlier about the kinds of music you liked. Has there been a change in your musical interests as a result of last.fm recommendations?</li> </ul>
Social media channels:	<ul style="list-style-type: none"> <li>● Have you ever received comments about your 'music taste'/your music library from other users? (If yes, what kind of comments did you receive? . . .)</li> <li>● Do you sometimes check other users to see whether there is compatibility between your and their musical tastes? . . .</li> <li>● Have you ever written comments to other users about their lists and music taste? (If yes, could you please elaborate?)</li> </ul>

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