Investigating the interactions between individuals and music technologies within contemporary modes of music consumption
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Abstract

This paper investigates the missing link between music and material studies in analyses of everyday music reception. In light of the increasing material fragmentation and heterogeneity of contemporary modes of music consumption, I interrogate how to theorize the materiality of music technologies within everyday interactions with music. Thus, I review accounts on 'music and everyday life' before discussing contemporary modes of music consumption. Then I proceed to look at how recent technological changes have contributed in re-configuring questions of materiality in analyses of music reception. Ultimately, the article explores the relationship between individuals and the technologies they use to listen to music. The multiplicity of material options at individuals' disposal accounts for both the presence and diffusion of music within everyday life.

Contents

1. Introduction

This paper discusses the ways in which the materiality of music technologies can be included within analyses of everyday interactions between individuals and recorded music, in the context of the digital age of music technologies. Drawing on the contemporary modes of music consumption that are increasingly characterized by the fragmentation and heterogeneity of material interactions with music, I seek to understand how listening practices are not only defined by the music content listened to, but also by the type of technology and materiality used to do so. Scholarly investigations related to music listening are traditionally divided

between two paradigms: one that poses 'music' as an object that individuals interact with in everyday life and which affects them (see DeNora, 2000, 2003; Hennion, 2003, 2007; Hennion, *et al.*, 2000); and a second that scrutinizes particular music technologies and their materiality to explore the type of cultural changes they induce (see Bull, 2005, 2007; Simun, 2009; Sterne, 2006). While the former paradigm critically neglects to account for the materiality of music technologies, the latter neglects the importance of music content that individuals listen to through these technologies as well as other forms of material consumption of music.

The context of the 'digital age' of music technologies is quite unique in regard to how individuals consume music, and to how music has become omnipresent in modern societies. The rhetorical argument of the 'digital revolution' (see Knopper, 2009; Kot, 2010; Kusek and Leonhard, 2005) has been conveyed to account for the changes in the ways individuals interact with music since the advent of Napster in 1999. In fact, in lieu of a 'revolution', there has been an increasing differentiation of the material conditions through which individuals access and listen to music in everyday life. Numerous quantitative inquiries describe the co-existence of various modes of consumption, such as legal and illegal downloading, streaming services, CDs and vinyl discs (see American Assembly, 2012; IFPI, 2011, 2012, 2013; Nielsen, 2013; Statista, 2014; UK Music, 2009). These modes of consumption are fragmented — in that one mode of consumption relates to one type of music content (style and genre) — and heterogeneous — in that different modes of consumption are combined throughout the course of everyday life. The complexity and uncertainty of contemporary modes of music consumption clearly puts the materiality of music technologies at the core of analyses of everyday music listening practices. Indeed the nature of changes brought about by digital technologies is to be sought within everyday practices, which are often overlooked by accounts claiming, or even advocating for, a 'digital revolution'. The diffusion of music is intertwined in the relationship between individuals, music technologies and music content, as unfolding within the course of their everyday lives.

In this article, I argue that research on music consumption in everyday life has to account for the variety of technologies used to access and listen to music, and the type of material engagements with those technologies that define everyday listening practices. Rooted in the broad context of mass availability of digital technologies, this paper seeks to address and understand the reasons behind contemporary fragmented and heterogeneous modes of music consumption. It is divided into five sections. The first one reviews accounts on music and everyday life (see DeNora, 2000; Hennion, 2003, 2007) and discusses their limits in regards to the lack of scrutiny for the material conditions of individuals' everyday interactions with music. The second section looks at contemporary modes of music consumption characterized by the use of different music technologies by individuals and explores the differentiation of these material practices by advancing the notions of 'fragmented' and 'heterogeneous' modes of consumption. The third section discusses research that scrutinizes interactions between individuals and one type of music technology and notably discusses the work of Michael Bull (2005, 2007) on the iPod and Jonathan Sterne (2006) on the MP3 file. I argue that isolating one type of music technology to research its cultural relevance consists of overestimating the potentiality of the object in relation to other forms of material consumption of music. The fourth section explores the concept of 'affordances' (Gibson, 1979; Hutchby, 2001a, 2001b) in relation to the materiality of music technologies and discusses how it helps differentiate the material conditions of music listening practices. Affordances are ways for individuals to decide over the type of listening practice they want to engage in, as they clearly induce different forms of material and musical interactions. Lastly, the fifth section questions how affordances are constantly read as signs within the moments of 'pragmatic interactions' (Dant, 2008) between individuals and music technologies, and how their meanings subsequently change. Indeed, affordances are tested in the context of listening practices, and the ways these material interactions play out alters how individuals continuously use one music technology, or abandon it over time.

2. Music and everyday life — Without materiality

The last couple of decades have seen the emergence of an important

amount of studies focusing on the relationship between individuals and music (see Crafts, *et al.*, 1993; Clarke, 2005; DeNora, 2000, 2003, 2006; Frith, 2003; Hennion, 2003, 2007; Hennion, *et al.*, 2000; Sloboda, 1991, 2000; Small, 1998). Despite the variety of disciplines (cultural studies, psychology, sociology) to which they belong, all these studies share some common trends. First, they present music as a mediated and contextualized object that individuals interact with in their everyday lives. Second, they tend to move away from the textuality of music as an explanation for its effects/affects. Third, they seek to explore the subjective interpretations of music that make it an essential instrument of individuals' everyday lives. Overall, these studies have bettered our understanding of the place that music holds in contemporary society, notably its capacity to induce action and emotions. However, they also largely neglect the material conditions of everyday interactions between individuals and music. In this initial section, I choose to focus on the accounts of Tia DeNora (2000, 2003, 2006) and Antoine Hennion (2003, 2007; Hennion, *et al.*, 2000), who both offer thorough conceptualization of the relationships between individuals and music.

The first instance is DeNora's study on 'music and everyday life' (2000; see also 2003, 2006). DeNora locates the meaning of everyday interactions between individuals and music within contexts. She writes: 'it is probably impossible to speak of music's "powers" abstracted from their contexts of use' [1]. In such contexts, music is mediated by an assemblage of variables that alters how individuals interpret it. It is this assemblage that DeNora aims to analyze: 'The point … is that music analysis, traditionally conceived as an exercise that "tells" about the "music itself", is insufficient as a means for understanding musical affect, for describing music's semiotic force in social life' [2]. Music is a part of this assemblage in that it communicates certain affects to individuals within these contexts of use.

DeNora borrows the concept of 'affordances' (Gibson, 1966, 1979) to explore the different uses and affects of music. For instance she explores how music 'affords bodily process' [3] for exercising or how it is utilized in relation to intimate relationships and/or memories: 'Music [helps individuals] to recall lovers or former partners and, with these memories, emotionally heightened phases or moments in their lives.' [4] To DeNora, music is an *object* in that it affords possibilities of action. She writes: 'Music is a resource — it provides affordances — for world building.' [5] Her research however never mentions the music technologies used to listen to music, nor the importance of their materiality within everyday interactions with music. DeNora acknowledges the various uses of music but takes the actual interactions with music technologies out of the assemblage.

Hennion (2003, 2007; Hennion, *et al.*, 2000) scrutinizes the musical journey of 'amateurs', who are individuals who develop a passion for music. He considers that everyday interactions with music have an uncertain outcome and depend on the trajectories taken by individuals. He writes:

> Direct contact with things, uncertainty of sensations, methods and techniques used to become sensitive to, and to feel the feeling of, the object being sought — in the sociology of culture, these moments and gestures of taste are either neglected, or are directly denounced as rituals whose principal function is less to make amateurs 'feel', than to make them 'believe'. [6]

Music is not only contextualized and mediated, but it is also embodied by the particular gestures deployed by 'amateurs', and which increases their chances at reaching a feeling of 'musical pleasure'. Contrary to DeNora (2000), Hennion mentions the CD but it is only ' … understood as a specific mediator, that enables new practices, a more intimate and personalized appropriation of music.' [7] To Hennion, the CD is a technology that has democratized the access to music — due to its high quality standards and relatively cheap prices — and which also gives individuals a greater control over how they want to listen to music. While highly questionable, this argument provides an insight over how Hennion frames the materiality of the CD. For example, writing about one of his interviewees (Dora), he states: 'She has bought a particular type of CD player, and so was well prepared with regard to this taste, not to listen to different kinds of music, but to know what might please her at any given

moment. She has equipped her taste.' [8] To Hennion, the CD is merely an intermediary to the expression of one's music taste. On the other hand, how its materiality participates in the musical journey remains unexplored.

Overall, accounts that research the individual expression of music taste through everyday listening practices are essential to think about the diffusion of music and its cognitive components in everyday life. However, while much of this research has been conducted and written at the time of a transition between music technologies and of unprecedented changes in the ways that individuals interact with music, it is regrettable that neither of these theorists have deigned incorporating music technologies in their analyses. The materiality of music technologies is only rarely mentioned in these accounts, but mostly ignored. Objects that play music are at best considered as intermediaries to music's affects. In that regard, both DeNora and Hennion fail to grasp upon the technological context within which they conducted their research. In minimizing the input of music technologies in the ways individuals listen to music on an everyday basis, they miss on the effects that the materiality of such objects has on individuals. Music technologies have particular characteristics, or 'affordances' (Gibson, 1979) that contribute in their appeal and in the ways individuals listen to music. As I will argue below, the affordances of music technologies are so many options that individuals think about to engage in listening practices, particularly at times when technological and material ways to access music are multiple and differentiated. Then, affordances are redefined within 'pragmatic interactions' (Dant, 2008) in that they are contextualized within music listening practices. Thus, the interactions between individuals and music are necessarily mediated by the technological means that diffuse music. Hence, the system of interactions — or assemblage — that defines everyday music listening practices is more complicated than the direct relationship between individuals and music that both DeNora and Hennion scrutinize. Music is not a singular object that either has 'affordances' or that is interpreted through individuals' gestures. It takes part in a complex system of material interactions. In what follows, I intend to move beyond the micro-analysis of music consumption to look at quantitative data about contemporary modes of music consumption, in order primarily to seize upon the diversity of technological forms that recorded music takes in everyday life. The aim is to reintroduce the technological means used to listen to music at the core of everyday interactions between individuals and music, before then discussing how to theorize such interactions.

3. The fragmentation and heterogeneity of contemporary modes of music consumption

The digital era of music technologies started with the advent of the compact disc (CD) in the early 1980s and was initially characterized by a period of increasing homogeneity of this format in modes of music consumption throughout the 1980s and 1990s. Then, in the late 1990s, the massive diffusion of digital music files through peer-to-peer technologies has opened a second period of the digital era. The effects of contemporary technological changes have often been overestimated (Nowak, 2014), notably through the rhetoric of a 'digital revolution' (see Kusek and Leonhard, 2005; Knopper, 2009; Kot, 2010). In looking at the first few years of the development of peer-to-peer and other digital technologies, analysts of the 'digital revolution' see in the potential of the technology and in its early massive adoption the elements of a replacement of every other technology by digital ones. Thus, the 'digital' is seen as transforming cultural practices around music like no other technological innovation has (see the analysis made by Prior, 2010). But it also supposedly questions the persistence of any other technological devices — particularly the one of the CD.

The problem with such framework relates to two types of analytical overestimations. First, looking at digital technologies through the lens of a revolution consists of solely depicting the initial infatuation that was caused by the novelty of peer-to-peer technologies. The second issue lies in the overestimation of the impact of such technologies on cultural changes and modes of consumption. Thus, it presupposes an irrefutable connection between the advent of new technologies and the changing of cultural practices, which comes to relate to technological determinism. About the notion of technological determinism, social media researcher danah boyd writes: 'utopian and dystopian views assume that technologies

possess intrinsic powers that affect *all* people in *all* situations the same way.' [9] In fact, in introducing digital technologies within pre-existing modes of consumption, and in benefiting from a certain historical distance from their initial advent, it is possible to provide a more nuanced account on how modes of music consumption have changed after the advent of digital technologies.

Fifteen years have now passed since the launching of the peer-to-peer application Napster. The democratization of illegal downloading of music has had major effects on individuals' access to music, on the drop of CD sales and on the questioning of current models of recorded music industries. After about a decade of uncertain times when music industries first rejected digital music files as a possibility to market recorded music, the technology has been commodified through legal online platforms that sell digital music files (notably the iTunes store in 2003 and Amazon in 2007). Thus, the subversive quality of digital music files — acquired through the online exchanges between peers, in illegality and outside the scope of music industries — has vanished through the commodification of these sound carriers by the said music industries. However, contrary to what was initially announced, and to what analytical frameworks like 'digital revolution' suggests, digital music files have not necessarily replaced other technologies and the digital age has rather seen an increasing multiplication and differentiation of modes of music consumption.

More than a decade after the advent of Napster and similar peer-to-peer technologies, many quantitative studies have analyzed the technological means through which individuals access and listen to music (see American Assembly, 2012; IFPI, 2011, 2012, 2013; Nielsen, 2013; Statista, 2014; UK Music, 2009). All these inquiries point towards materially differentiated ways of consuming music, suggesting that music technologies are not mutually exclusive. For instance, reports from the International Federation of the Phonographic Industry (IFPI hereafter) indicate changes of distribution and consumption modes of music (see IFPI, 2011, 2012, 2013). These changes are however not located within a shift from physical media (CD, vinyl discs and cassette tapes) to digital media (principally, MP3 files and streaming services) but remain more complex. Similar to the findings of IFPI, the research group American Assembly (2012) notes various attitudes towards digital media, illegal downloading and copyright infringement. While they suggest that illegal downloading has become common in the U.S., they also find that a tiny minority of American Internet users are 'large-scale' downloaders. More surprisingly, the CD remains an important cultural artifact and the primary access to music for many (IFPI, 2012; UK Music, 2009). In the meantime, the vinyl disc is undergoing a revival and seems to correspond to the consumption of genres such as classic rock or electronic music (see Bartmanski and Woodward, 2013; Hayes, 2006). Typically, the vinyl disc refers to a 'fragmented' mode of consumption in that it connects the materiality of the music technology with a particular taste for a style or genre of music. To classic rock or electronic music enthusiasts, the object embodies their music taste. The concept of 'fragmentation' of modes of consumption establishes the interconnection between certain music genres and modes of music consumption through technologies. For instance Andrew Whelan (2008) remarks that in underground electronic/noise music genres, the 'grime' genre is associated with the cassette tape while taste for 'breakcore' is rather embodied by the MP3 file. Audiences interested in particular music genres are then likely to develop modes of music consumption that take into consideration what is deemed as the appropriate music technology to interact with such music.

What quantitative inquiries suggest is that although digital media have found their place within individuals' everyday life, they also take part within pre-existing set of practices. But this fragmentation is also accompanied by an increasing heterogeneity of modes of consumption. Repertoires of music preferences are said to become increasingly eclectic (see Glévarec and Pinet, 2012). Eclectic preferences induce different ways to approach music genres, as well as hierarchies of preferences that are enacted by the music technologies that individuals use. In other words, while there exist audiences that develop one specific mode of music consumption with one type of technology (fragmentation), there are also audiences that diversify the ways they consume music, through the use of several types of technologies (heterogeneity). A study led in 2009 by research institute 'UK Music' goes in that direction. The study has found that young people (between 14 and 24 years old at the time) consume music through different sorts of music technologies, despite their massive use of illegal and free access to music content. Thus, the research

institute remarks: '85% of P2P downloaders would be interested in paying for an unlimited, all-you-can-eat MP3 download service. 57% of these said such a service would stop them using unlicensed P2P services, and 77% that they would still continue to buy CDs.' [10] Drawing on these results from UK Music, it seems that those who download the most music illegally are not 'greedy' or necessarily defined by an anti-system ideology, contrary to what Chris Rojek (2005) claims. Despite the access to music for free, it is striking that three quarters of them are still interested in purchasing CDs. UK Music explains this as follows: '… the desire of respondents to actually "own" a physical product remains strong — whether for tangible reasons such as artwork or sleeve notes, because they feel they are supporting the artist, or simply because the sound quality is better.' [11] The French research institute Centre de recherche pour l'étude et l'observation des conditions de vie (hereafter CREDOC) (2010) confirms this trend and even talks about 'eclectic' modes of consumption. They also find that Internet users are the ones who spend the most money on cultural 'goods'. In fact, they correlate the total of money spent on culture with the 'eclecticism' of modes of cultural consumption (CREDOC, 2010). It results in practices of consumption that are materially heterogeneous. Moreover, listening to music increasingly involves material artefacts that are not primarily 'music technologies', such as personal computers that act as a 'hub' to acquire, exchange and listen to music (see David, 2012; Granjon and Combes, 2009).

The point that I want to stress is that taking into account the material fragmentation and heterogeneity of modes of music consumption within analyses of everyday music listening practices is crucial. Writing on this matter, Paolo Magaudda argues: '… the process of digitalization of music consumption has shown that, although music has changed in the passage from tangible records to intangible data, musical material objects and technologies still play a relevant, and to some extent more important, role in music consumption practices.' [12] Fifteen years after the advent of Napster and peer-to-peer technologies, digital technologies seem to have participated in a double movement when it comes to everyday listening practices of music: digital technologies interconnect several material objects into what Magaudda (2011) calls a 'circuit of practices' while they also emphasize the characteristics (or affordances) of other 'physical' music technologies. The various behaviors that individuals develop towards the digital age and illegal downloading (see American Assembly, 2012; UK Music, 2009) also anchors and explains the continuing presence of 'physical' media.

In contrast with the overwhelming domination of the CD in the late 1980s and throughout the 1990s (see Coleman, 2003; Tournès, 2008), the digital age is characterized by more diverse and uncertain modes of consumption where one format does not necessarily replace another, but complement it to further establish the differentiated omnipresence of music in everyday life. Modes of consumption through various technologies induce particular musical experiences, which emphasize the role that their materiality plays within musical affects. In the next section, I investigate how interactions with the materiality of specific music technologies correspond to a particular mode of consumption, and result in differentiated musical experiences.

4. Focusing on music technologies' materiality

There are numerous studies that specifically look at how individuals interact with one particular music technology. The purpose of such studies is to understand the characteristics, historical evolution (or biography) of these music technologies. These accounts explain the entanglements of the interactions between individuals and the materiality of music technologies. However, they are often limited to the scrutiny of one particular mode of music consumption — be it the one with the Sony Walkman (see Bull, 2000; Hosokawa, 1984), vinyl disc (see Bartmanski and Woodward, 2013; Hayes, 2006), the compact disc (Downes, 2010), car stereo (see Bijsterveld, 2010; Bull, 2004), MP3 file (see Granjon and Combes, 2009; Sterne, 2006; Whelan, 2008) or iPod (see Beer, 2010; Bull, 2005, 2007; Prior, 2014; Simun, 2009). In that regard, these studies are not as comprehensive as analyses from the paradigm on 'music and everyday life'. Nonetheless, they point to essential ideas as to why individuals choose to access and listen to music with a particular type of technology. In this section, I will focus on some studies about the

materiality of MP3 files and the iPod in order to investigate how scholarly research has analyzed these digital technologies and interpreted the cultural changes they induce.

In an introductory essay to a special edition of the journal *Social studies of science* on sound studies, Trevor Pinch and Karin Bijsterveld (2004) call for a greater understanding of the place of music in our contemporary societies. They argue that this must be undertaken through a scrutiny of the material conditions of everyday listening practices: 'Whole areas of music technology and vast areas of listener experience remain completely un-charted.' [13] By complementing the inputs of different theorists, it is possible to chart the material interactions developed by individuals with music technologies to trigger musical experiences. The first instance is Jonathan Sterne's (2006) work on the MP3 file as a material artifact. Sterne contends that the MP3 is an *interactive* format: 'The MP3 is a crystallized set of social and material relations. It is an item that "works for" and is "worked on" by a host of people, ideologies, technologies and other social and material elements.' [14] Sterne focuses on the materiality of the digital files, but isolated from the context of its uses. For instance, he writes:

> MP3s use psychoacoustic principles to get rid of the sounds that we supposedly would not hear anyway. There are three specific psychoacoustic tricks that MP3 encoders use to reduce the size of data files: simultaneous or auditory masking, temporal masking and spatialization. [15]

As such, Sterne enounces a characteristic of the object that neglects its existence within a network of other objects. Yet, the MP3 file itself is nothing without a playback device (computer, smartphone, iPod and so on) and a sound system (headphones or speakers) to be listened to. To Sterne, the network of material objects within which the digital file takes place is only a consequence of how it is "designed":

> MP3s are designed to be heard via headphones while outdoors, in a noisy dorm room, in an office with a loud computer fan, in the background as other activities are taking place and through low-fi or mid-fi computer speakers. [16]

When inscribing this specific format within everyday music consumption, it is clear that MP3s are listened to in various configurations of space, time and materiality. In fact, the conditions of use of the MP3 file depend on much more than simply how it is designed, or with what purpose. Although Sterne's account is useful to think of the MP3 as a material object, with its own characteristics, he fails to grasp upon how the file is used and given meaning to by individuals. Indeed, the characteristics of the technologies alone do not explain how it has been adopted by individuals, and how it is diffused within everyday practices.

Through his studies of mobile listening practices, and particularly of the iPod, Michael Bull introduces a more interactive component to the study of digital music technologies' materiality by looking at the context of their uses. Bull (2005) is interested in how individuals create new forms of 'mobile privatization' with material objects, and in how listening to music 'on the go' constitutes a 'cinematic experience.' The advent of mobile devices subsequently changes individuals' experiences of social spaces, and particularly of urban environments: 'The array of mobile sound media increasingly enables users to successfully maintain a sense of intimacy whilst moving through the city.' [17] This sense of intimacy in the social space individualizes iPod users' experiences of these very same social spaces. They can focus on their own emotional responses to the urban environments by enclosing themselves into a 'cocoon of sound' (Bull, 2005). Bull puts the emphasis on the technological object that he sees as the cause of these changes. Music listening practices are the result of material interactions with the iPod. He argues that iPod users '... construct meaningful and pleasurable narratives out of the routine linear and cyclical practices of their everyday movement through the city.' [18] The materiality of the iPod is here considered for its technological possibilities and it is what triggers the musical affect within urban contexts. Bull's analyses frame the iPod as the object of an era, as a revolutionary object in how it empowers its users.

His account has been critiqued by Miriam Simun. Although she basically agrees on the nature of change induced by the advent of the iPod, Simun operates a negative shift on such cultural practices by particularly looking at individuals' relationship to time. Simun depicts mobile listening practices as both 'empowering and illusory.' [19] Drawing on Adorno (1976) and Lefebvre (2002), she argues that this type of listening practices consists of a false liberation: 'By engaging the MP3, users turn their "constrained time" into leisure — transforming, as they describe, their "boring" and "stressful" commutes into times of entertainment and relaxation.' [20] Moreover, Simun provides a moralist spin on individuals' apparent withdrawal from the sociality of spaces: 'Once the MP3 is engaged, users choose the degree of attendance and presence they grant to the places they navigate.' [21] Her account provides a negative perspective on the same mobile listening experiences that Bull celebrates, and which recalls an argument made about the Walkman (see Richmond, 2006), and elsewhere on the iPod (see Goleman, 2006; see also Garner, 2014 for a broader discussion of the notion that such technology makes individuals 'anti-social'). Nonetheless, both Bull and Simun use the term 'MP3' generically and ultimately fail to provide a perspective on the diversity of listening experiences that MP3 files enable through the iPod, nor do they grasp upon the different materialities that accompany the interactions with such digital technologies.

All these accounts provide critical insights of how music technologies' materiality comes into play in the shaping of everyday listening experiences. In suggesting that music listening experiences are differentiated according to the technologies interacted with, they also emphasize the importance of looking at the materiality of music technologies and consequently disprove the perspective on affective response to music developed in the paradigm on 'music and everyday life'. Moreover, while these accounts detail the novelty of digital music technologies, they also provide balanced perspectives on the type of cultural changes induced by the 'digital age' of technologies. Sterne (2006) for instance focuses on the materiality of the MP3 file, while it is its immateriality that has been described as revolutionary (see Kusek and Leonhard, 2005). Bull (2005, 2007) emphasizes cultural practices that are in fact an extension of what was already possible with the advent of the Sony Walkman (see Hosokawa, 1984). Lastly, Simun (2009) draws a great deal on critical perspectives of Marxist tradition to emphasize the supposed withdrawal of individuals from social spaces through individualized mobile listening practices.

However, I draw a couple of criticisms on these analyses of digital music technologies' materiality. The first point is about the contrast that emerges between the analyses of one type of music technology on the one hand and contemporary forms of music consumption characterized by fragmented and heterogeneous material practices on the other hand. In other words, looking at how individuals interact with MP3 files or iPods only provides a limited explanation for how they interact with music throughout everyday life. Digital technologies are not the only type of material objects that individuals interact with to consume music (see UK Music, 2009). Consequently, emphasizing the qualities of, or the cultural changes induced by, one type of technology runs the risk of overestimating the significance of such object. Isolating the materiality of one music technology also neglects how it exists in relation to other technologies, in 'circuits of practices' (Magaudda, 2011) and it overlooks the comeback of analog technologies, like the vinyl disc (see Bartmanski and Woodward, 2013; Hayes, 2006). My second criticism to existing accounts on music technologies relates to their lack of engagement with material studies. Indeed, these accounts simply delineate the possibilities of music technologies, without offering a conceptualization of the interactions between individuals and the materiality of these objects. In what follows, I look at two types of interaction with music technologies, one that consists of accumulating objects, which I theorize through the concept of 'affordances' (Gibson, 1979; Hutchby, 2001a, 2001b), and one that occurs within the moment of interactions, and which I explore through the concept of 'pragmatic interactions' (Dant, 2008).

5. The affordances of music technologies

The fragmentation and heterogeneity of contemporary modes of music consumption anchors the materiality of music technologies in two fashions.

First, it is one critical element of the differentiation of musical experiences. Second, materiality participates in how individuals emotionally respond to music within listening practices, which is somewhat neglected by theories about music and everyday life (see Clarke, 2005; DeNora, 2000; Hennion, 2003, 2007). This section details the material differences between music technologies and how owning different ones offer options, or possibilities of musical experiences, to individuals. Then in the next section, I will explore the actual uses of these technologies to listen to music.

Like all material objects, music technologies have particular characteristics that make them more or less attractive to individuals. Within contemporary modes of music consumption, music technologies are constantly compared and contrasted (see Nowak, 2014). In other words, individuals look at how they can compose their everyday music listening practices in relation to the characteristics of these technologies, to the music content they own on each of these technologies, and to the type of listening practice they induce. Owning different music technologies provide so many options to trigger specific types of musical experiences. One way to conceptualize music technologies' material characteristics is through the notion of 'affordances'. Perception psychologist James Gibson (1979) coined the concept of 'affordances' as a noun to explore what material objects *afford*. Gibson argues that material things all have 'affordances' that explain the ways individuals interact with them: 'an affordance is neither an objective property nor a subjective property; or it is both if you want ... [It] points both ways, to the environment and to the observer.' [22] His theory of 'affordances' has recently been discussed and debated in a sociological context (see Bloomfield, *et al.*, 2010; Hutchby, 2001a, 2001b; Rappert, 2003).

Ian Hutchby (2001a, 2001b) suggests a re-actualization of the theory of 'affordances' in order to offer a 'third voice', in-between technological determinism and social constructivism. He writes: 'Sociologists need to see that social processes and the "properties" of technological artefacts are interrelated and intertwined, and need to analyze the ways in which they are.' [23] In Hutchby's language, interactions between individuals and material things are mediated by both the properties of objects and individuals' need to mobilize them. He further argues that 'different technologies possess different affordances, and these affordances constrain the ways that they can possibly be "written" or "read"'. [24] Listening to music is dependent upon the affordances of music technologies. Following on the success of Napster and its successors, digital music files have massively circulated across the globe. Their convenience as replicable and portable technologies has contributed in their appeal. In other words, the particular affordances of digital music files help understand how individuals have been driven to them, and how they have invaded modes of music consumption. For example, it is obvious that a technology like the iPod is more suited for mobile listening practices than other 'physical' devices. However, the utilitarian affordances of music technologies are not always the primary elements on which individuals decide what technology to pick. If it were however the case, digital technologies would dominate contemporary modes of consumption to an extent where no other technologies would persist. However, individuals prove to still be interested in consuming music through various material forms.

The research institute UK Music explains the attraction of young individuals for the CD as follows: 'The touch and feel of CD or vinyl, of having a tangible product in the hand, the appreciation of "seeing what effort has been put into the CD sleeve", is still "really interesting, it really grabs my attention", are all assets considered to have an inherent value much greater than that of an MPEG3 file.' [25] The CD is not only a material format that affords more aesthetic pleasure than a digital file, it also symbolizes the work of the artist compacted within an object. Left with different options — either downloading for free, exchanging files, paying for files, for a material object or for a subscription to a streaming platform — individuals navigate through the affordances of music technologies at their disposal. Digital technologies afford the convenience of a ubiquitous accompaniment of music across time and space. But when it comes to the displaying of musical preferences, to the materiality of recorded music and to the gestures adopted by individuals to interact with music technologies, CDs, vinyl discs or even cassette tapes offer significant affordances. In fact, these material objects have affordances that call upon individuals' senses and perceptual capacities. A computer or an iPod containing thousands of digital music files does not come to visually represent one's repertoire of preferences. On the other hand, a collection of a dozen of CDs or vinyl discs is a visual testimony to one's music taste over time.

The theory of 'affordances' as conceptualized by Hutchby (2001a, 2001b) has been greatly criticized for its lack of 'dynamism' (see Rappert, 2003). Indeed, solely inventorying the affordances of objects does not account for the ways in which individuals mobilize these affordances in their everyday interactions with music and with what outcomes. It explains the interest of collecting or owning different material objects, in order to have options to choose from, but affordances themselves do not offer an explanation of how the characteristics of music technologies unfold within everyday interactions. The affordances of music technologies are always there as they are material characteristics of these objects. However, they are made sense of when interacted with. Brian Bloomfield, Michelle Latham and Theo Vurdubakis (2010) argue that 'affordances' of technological objects need to be theorized as 'action possibilities'. They argue that affordances '... need to be understood in terms of the socio-historically contingent folding(s) of the body and the artefactual world into one another.' [26] Bloomfield, Latham and Vurdubakis open the door to a more interactionist perspective on affordances. Thus, affordances of music technologies are made sense of in a network of materiality. Their account echoes Magaudda's approach of music consumption through practices where '... the emergence of new objects and technologies can [...] be interpreted as a process consisting in their "performative integration" within the pre-existing configuration of practices.' [27] Not only is Magaudda's approach to modes of music consumption oriented towards the materiality of music technologies, but it also inscribes the materiality within pre-existing sets of cultural practices. The ways in which music technologies are used in the context of listening practices, and subsequently given meaning to, represent the cultural processes that measure their level of penetration in individuals' everyday lives.

The affordances of music technologies need to be explored within a network of materiality, and within the contexts of everyday life, which in turn suggests pre-existing routines on the part of individuals. In that regard, the theory of affordances is interesting for looking at the options that individuals have to interact with music and compose their everyday music experiences. Affordances are potentialities of interactions, which call upon individuals' perceptual capacities. Thus, individuals know that the array of music technologies at their disposal alters their emotional responses within listening practices. For instance, switching from a docked iPod at home to putting a CD of their choosing on a sound system corresponds to a different type of engagement with music and its materialities and results in subsequently different experiences of music listening. The next section looks at these moments of interactions between individuals and the affordances of music technologies.

■ ─────────────────────────────

6. The interactive possibilities of music technologies in everyday life

The theory of affordances offers a starting point to think of the materiality of music technologies in a network of materiality, but also as possibilities of material and sonic interactions within everyday life. The material possibilities of affordances are acted upon by individuals within contexts. The contextualization of material interactions with music technologies can either emphasize the affordances of music technologies (one example is the possibility to easily skip songs on an iPod) or deemphasize them (one example is how the aesthetic affordances of a CD cover can be forgotten about when listening to it). In this last section, I draw on Tim Dant's (2008) concept of 'pragmatic interactions' to explore the use of music technologies' affordances within the contexts of listening practices.

Dant never mentions the concept of affordances — his focus of attention is rather on the moment of interactions between individuals and material things. He acknowledges that objects have inherent characteristics that delineate the possibilities of actions upon them and interactions with them. He writes: 'to design an object is to build into it characteristics of form and function that will be responded to by the consumer through material interaction.' [28] To Dant, these characteristics are signs, which only emerge within the moment of the interactions: 'The meaning of objects is understood by consumers through "reading" them as a set of signs that have meaning within the culture and the relation is pragmatic in that the meaningfulness of objects unfolds through interaction.' [29] Consequently, the definition that individuals give to material objects occurs in a dynamic process within the moments of interactions with them. Dant argues: 'The

communication process between humans and objects is "pragmatic" in the sense that meaning is contingent on the current situation that continually unfolds in the course of the interaction with the object.' [30] The input of Dant helps reveal how the materiality of music technologies can be contextualized within interactions with them. Coming back to the example of the iPod, the object is given meaning to in relation to how it is used, within a system of interactions between individuals' action (commuting to work for instance) and with the variables that come to their perception at the time of the material interactions. But the dynamics of such definition also coexist with a reflexive process of selection — what Ian Woodward (2011) refers to as 'navigating through a forest of objects' — that draws on how individuals perceive music technologies' affordances, and how they expect these to unfold within the moments of interactions with them. While Dant sees objects' characteristics as signs, I draw on the theory of affordances — as developed by Bloomfield, *et al.* (2010) — to locate the action of selecting the type of material object to listen to music. Indeed, Dant does not take into consideration how different material objects are compared by individuals, and the basis on which they select one over another one to interact with music. Looking at the affordances of music technologies does.

In the digital age when modes of music consumption are materially differentiated (see American Assembly, 2012; UK Music, 2009), it is essential to consider affordances on the hand, and pragmatic interactions on the other hand. Affordances of music technologies define the type of material interactions that unfold during music listening experiences, as much as the moments of interactions change the meaning of music technologies' affordances. The mutual definition between the context of interactions and the materiality of music technologies is at the core of differentiated modes of music consumption. Thus, the materiality of music technologies participates not only in the conditions of interactions with music, but also in the overall emotional responses that individuals feel from these interactions. In other words, individuals are affected in various fashions by music and the music technology they interact with. Choosing to listen to the same album on a vinyl disc or an MP3 file on an iPod induces different conditions of listening and emotional responses. This is in line with what Bloomfield, *et al.* (2010) assert about the appropriation and modulation of affordances by users. In exploring affordances and interactions, I divide modes of music consumption into two layers: one that posits the coexistence of technologies as so many possibilities of interactions (affordances); and one that consists of the moments of interactions with music technologies when individuals explore the affordances of music technologies and assign meanings to them (pragmatic interactions).

Affordances of music technologies — as their characteristics — are an array of options that individuals choose from. Once they take part in listening experiences, they are associated with emotional responses that individuals feel from these listening experiences, but also with the entanglements of patterns of listening and everyday activities. In other words, the very materiality of music technologies is given meaning to within its contextualization in everyday life. Dant recalls: 'Consumers communicate through sight, touch and sometimes other senses, using their whole body to both make sense of and to make use of the things around them.' [31] Perception changes affordances over time. It is through this process that certain technologies emerge in everyday practices while others disappear from it.

The contextualization of music listening practices is the primary tenet of analyses by DeNora (2000) and Hennion (2003, 2007). Music affects individuals differently. Part of this differentiation is to be attributed to the music technology used to listen to music. The materiality of music technologies anchors them within a type of everyday practice, which includes the aestheticization of listening experiences, the type of bodily gestures they adopt (see Dant, 2008) and the emotional composure of individuals. Throughout the last couple of decades, music has increasingly formed a continuous flow within everyday life. The reason behind it is not only the technological evolution that has marked the last 130 years of recorded music, but also the variety of objects (and their affordances) that coexist now to induce differentiated types of listening experiences. In other words, in light of the fragmented and heterogeneous modes of contemporary music consumption, looking at the ways in which individuals make sense of music technologies' affordances, and how these play out within contexts of listening is critical to account for the diffusion of music in everyday life and how it affects individuals.

7. Conclusion

This article has discussed issues of music consumption in relation first to macro statistics that point towards a greater fragmentation and heterogeneity of the ways in which individuals interact with music technologies, and second in relation to more micro and grounded accounts of everyday listening practices. Indeed, at times when individuals materially differentiate their interactions with music throughout the course of their everyday lives, research that I have grouped under the banner 'music and everyday life' (see DeNora, 2000; Hennion, 2003, 2007) fails to grasp on the significance of music technologies' materiality in individuals' relationship with music, and in their emotional responses to it. On the other hand, accounts that look at one particular type of technology (see Bull, 2005, 2007; Simun, 2009; Sterne, 2006) tend to emphasize the significance of one object over others, and therefore to overestimate its performative possibilities and its capabilities to induce cultural changes.

In this paper, I demonstrate how the materiality of music technologies plays out in two distinct ways in individuals' everyday lives. First, the affordances (see Bloomfield, *et al.*, 2010; Gibson, 1979; Hutchby, 2001a, 2001b) of different music technologies are contrasted and compared by individuals to think about the type of music experiences that they induce. They are also given meaning to through perception within 'pragmatic interactions' (see Dant, 2008). The adoption of particular music technologies over time is explained by how their affordances exist in relation to other technologies, and by how they are associated with particular everyday activities. Research on music consumption must take into consideration the materiality of the technologies that individuals interact with in order to grasp upon how it participates in the emotional responses to music. Indeed, more than mere intermediaries to the sound of music, music technologies intertwine the variables of materiality and music within the everyday contexts of listening practices. **FM**

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Notes

1. DeNora, 2000, p. x.

2. DeNora, 2000, p. 23.

3. DeNora, 2000, p. 101.

4. DeNora, 2006, p. 142.

5. DeNora, 2000, p. 44.

6. Hennion, 2007, p. 98.

7. Free translation by the author. Hennion, *et al.*, 2000, p. 133.

8. Hennion, 2007, p. 110.

[9.](#) boyd, 2014, p. 15.

[10.](#) UK Music, 2009, p. 6.

[11.](#) UK Music, 2009, p. 20.

[12.](#) Magaudda, 2011, p. 31.

[13.](#) Pinch and Bijsterveld, 2004, p. 636.

[14.](#) Sterne, 2006, p. 826.

[15.](#) Sterne, 2006, p. 834.

[16.](#) Sterne, 2006, p. 835.

[17.](#) Bull, 2005, p. 345.

[18.](#) Bull, 2005, p. 346.

[19.](#) Simun, 2009, p. 923.

[20.](#) Simun, 2009, p. 928.

[21.](#) Simun, 2009, p. 931.

[22.](#) Gibson, 1979, p. 129.

[23.](#) Hutchby, 2001b, p. 442.

[24.](#) Hutchby, 2001b, p. 447.

[25.](#) UK Music, 2009, p. 4.

[26.](#) Bloomfield, *et al.*, 2010, p. 417.

[27.](#) Bloomfield, *et al.*, 2010, p. 21.

[28.](#) Dant, 2008, p. 12.

[29.](#) Dant, 2008, p. 13.

[30.](#) Dant, 2008, p. 15.

[31.](#) Dant, 2008, p. 15.

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