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Understanding the value of networked publics in radio: employing digital methods and social network analysis to understand the Twitter publics of two Italian national radio stations

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ABSTRACT

Radio audiences are today a mix of traditional radio broadcasting audiences and networked publics (boyd, d. [2007]. Why youth (heart) social network sites: The role of networked publics in teenage social life. In D. Buckingha (Ed.), *MacArthur foundation series on digital learning–youth, identity, and digital media volume* (pp. 119–142). Cambridge, MA: MIT Press; Ito, M. [2008]. Introduction. In K. Varnelis (Ed.), *Networked publics* (pp. 1–14). Cambridge, MA: MIT Press; Varnelis, K. (Ed.). [2008]. *Networked publics*. Cambridge, MA: MIT Press; Varnelis, K. (Ed.). [2008]. *Networked publics*. Cambridge, MA: MIT Press; boyd, d. [2011]. Social network sites as networked publics: Affordances, dynamics, and implications. In Z. Papacharissi (Ed.), *A networked self identity, community, and culture on social network sites* (pp. 39–58). London: Routledge). This not only means that new media is changing the nature of listeners/viewers, transforming them into interactive users, but also that radio publics, once organized into networks, may have different properties, different behaviours and different values. In this paper, we have employed Digital Methods (DM) (Rogers, R. [2009]. *The end of the virtual*. Amsterdam: Amsterdam University Press) and social network analysis to understand the Twitter activity and the communicative dynamics of the audiences of two Italian national radio stations: Radio3 Rai (public service station) and Radio Deejay (private commercial station). This work also aims to respond to a question asked by Rogers when defining DM: 'Could the information contained in profiles on social networking sites provide different insights into the composition and characteristics of publics?' (Rogers, R. [2009]. *The end of the virtual*. Amsterdam: Amsterdam University Press). Based on the results that have emerged from this study, we believe that the answer can be affirmative: the analysis of the social connections and the interaction models of the networked listeners highlights new features of these audiences, and allows us to reevaluate and understand them from new points of view. This work shows that the digital audiences related to the two radio stations clearly distinguish themselves for their distinctive online behaviour and a different display of social networks, cultural capital and affect. We therefore hypothesize the presence of three different types of capital within the two different audiences analysed: social, cultural and affective capital.

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Introduction

This article has two objectives related to audience and publics research: the first is to explore the properties of the networked publics connected to radio, the audience members Bonini (2015) calls *networked listeners*. These are listeners who, in addition to listening to radio, interact with it and among each other on social networking sites connected to radio, taking part in collective discussions that arise from the content broadcasted by radio; the second objective is to discuss the consequences of a possible paradigm shift in the methods of audience analysis.

In order to proceed, this study utilized research tools belonging to the so-called Digital Methods (DM) (Rogers, 2009), including social network analysis and content analysis, and applied them to a data-set of 27,667 Tweets written in Italian, gathered between 11 May 2014 and 12 June 2014 by following the keywords @radiodeejay and @radio3tweet. These are the Twitter profiles of two Italian national radio stations, Radio Deejay and RAI Radio 3. Radio Deejay is a private commercial radio, based on a format of contemporary hits and urban music, with 4.4 million listeners per day and a target age of 25–44 years (Eurisko, 2015). RAI Radio 3 belongs to RAI, the Italian public service media company that offers three national radio stations in FM, Digital Audio Broadcasting and Internet streaming. RAI Radio 3 is a cultural and talk and news channel (1.2 million listeners per day targeting those over 45 years of age Eurisko, 2015), with a focus on jazz, classical and experimental music as well as science, foreign affairs and intellectual formats.

These two radios were chosen because they represent two distinctive radio formats followed by very different audiences. They were studied by focusing on the analysis of the structures and characteristics of their main networks – networks that emerge from both the interactions between radios and listeners and among listeners themselves.

This research started from the following questions: *What are the communicative dynamics of the audiences of Radio Deejay and RAI Radio 3 on Twitter's digital environment? Do substantial differences exist between the two? If so, what types? Do the networked listeners of the private broadcaster Radio Deejay generate different dynamics from those of the networked listeners of the public service broadcaster RAI Radio 3?*

The results of this research show that very important differences do exist among the communicative patterns of the listeners of the two radios analysed. Specifically, this work will examine how the network made up of public service radio listeners active on Twitter greatly distinguishes itself from the network of listeners linked to the private radio station Radio Deejay in terms of online behaviour, social networks' structure, display of cultural capital and affect.

This work also aims to respond to a question asked by Rogers (2009) when defining DM: 'Could the information contained in profiles on social networking sites provide different insights into the composition and characteristics of publics?' (p. 35). Based on the results that have emerged from this study, we believe that the answer can be affirmative: the analysis of the social connections and the interaction models of the networked listeners highlights new features of these audiences, and allows us to reevaluate and understand them from new points of view.

We therefore hypothesize the presence of three different types of capital within the two different audiences analysed: social, cultural and affective capital. These types of capital will be discussed in the last two sections of this article.

We believe that the interpretation of these data can promote and stimulate a long-term debate on the redefinition of the qualitative and quantitative parameters that are traditionally adopted by the academic scholars in the audience and publics' research and by the broadcasting markets in the audience rating systems, with ethical consequences for the use of data gathering.

Theoretical framework: the networked listeners

Content produced by the media, and by the radio in particular, has never had such a rich social life. In the past, what one heard on a radio programme could only be discussed with a private circle of friends; today, the opinions of listeners generate more noise in the public space of (private) social networks. Social media extends public participation to large crowds (Arvidsson, Caliandro, Airoldi, & Barina, 2015). At the same time digital data make crowd dynamics observable with greater ease: audiences are making more 'noise' than ever. Listeners are becoming more and more productive, and this productivity consists of both the generation of one's own content and the circulation of media content (Jenkins, Ford, & Green, 2013).

A major shift is occurring in the conceptualization of the mediated publics, once these publics start to interact through social network platforms (Boccia Artieri, 2012). The network society we live in today has produced a new configuration of mediated publics: the networked publics. boyd (2007) and Ito (2008) were the first to use the term. danah boyd coined the expression for the first time in 2007, and later described networked publics as 'publics that are restructured by networked technologies' (boyd, 2011, p. 41). Building on boyd (2007, 2011), Ito (2008), Varnelis (2008), and Bonini (2015) applied the networked publics concept to radio listeners in a network society and talked of *networked listeners*. Radio, and more generally, media audiences in the age of the network society (Castells, 1996; van Dijck, 1999; Wellman, 2001) are better understood as networks of listeners, rather than groups belonging to specific social and economic clusters. Networked listeners' actions (making comments, remixing media items, sharing media objects, producing user-generated or user-circulated content) all happen within networks. For this reason, they should be investigated through the lens of network theory: 'In network theory, a node's relationship to other networks is more important than its own uniqueness. Similarly, today we situate ourselves less as individuals and more as the product of multiple networks composed of both humans and things' (Varnelis, 2008, p. 153). Rainie and Wellman believe that 'each person has become a communication and information switchboard connecting persons, networks and institutions' (2012, p. 55). Listeners are no longer alone and invisible, but connected with many others in a variety of social circles with diversified portfolios of social and cultural capital.

The integration of social networking sites in radio production and interaction routines makes the immaterial capital (data) created by networked listeners become public and tangible. While until recently the audience was invisible to radio and confined to its private sphere, except in the case of phone calls during a programme, today listeners linked to the online profile of a radio programme are no longer invisible or private, and the same goes for their opinions and emotions. If traditional terrestrial radio always measured attention of its listeners, today it can also measure the opinions, the emotions and the affective

intensity of its networked listeners. Affect is a new common good that media corporations are trying to commodify (Arvidsson & Bonini, 2015).

The value embedded in the networked publics is not yet convertible into economic capital, but the crisis of traditional mass advertising will lead to a future increase in – and refining of – tools for the capitalization of the wealth of networked publics linked to radio programmes and stations.

The research performed and the results described in this article represent an attempt to verify the consistency of the idea of networked listeners at an empirical level.

This study is only a first step in the exploration of an emerging field of research. It does not aim to find answers, but to discover new questions that will allow us to continue our research journey.

Methodological framework

This work lies within the epistemological paradigm of the DM developed by Richard Rogers. The main goal of the DM is to inaugurate a new era of social research on the Internet, overcoming the dichotomy between real and virtual (Rogers, 2009). According to Rogers, today the Internet allows researchers to go far beyond the simple study of culture online. The point is not to ask how much culture and society is to be found online, but rather how it is possible to understand and anticipate cultural changes and social conditions by studying culture and society with the Internet: 'the Internet may be rethought as a source of data about society and culture'.

This is why the DM start with recognizing the Internet not only as an object of study, but as a methodological resource as well. Based on this premise, Rogers coined the term *online groundedness*, which means the effort and attempt of DM to *learn* from the medium ('follow the medium', Rogers, 2009). The epistemological paradigm of virtual methods requires the adaptation of traditional research methods to the online domain, thus *virtualizing* them (virtual surveys, virtual interviews, etc.). On the contrary, DM invite the researcher to seriously consider the nature and architecture of digital environments, and to systematically observe how these structure the communicative processes that take place within them (Marres & Weltevrede, 2013).

Methods, data and analysis

This research is based on a data-set of 27,667 Tweets written in Italian, gathered between 11 May 2014 and 12 June 2014 by following the keywords @radiodeejay and @radio3-tweet. In particular, 17,165 Tweets were gathered for the keyword @radiodeejay and 10,502 for @radio3tweet. We chose to focus solely on these two keywords because our methodological goal was to intercept and delineate the *most active publics* of the two radios, made up of a group of networked listeners searching for direct contact with their favourite radio, who are more dedicated to the co-creation of content along with it.

Tweets were gathered through a custom-written Python script, built based on the Python Programming Language, which interrogated the Twitter's application programming interfaces (APIs). Data were gathered through the API search provided by Twitter[1] (Russell, 2013). This method allows you to download Tweets up to 7 days old

(Kwak, Lee, Park, & Moon, 2010); for this reason data were systematically gathered by performing the research once a week for four weeks.

The data-set thus obtained was examined with two types of analysis, *quantitative* and *qualitative*. The quantitative analysis consisted of a network analysis (Hogan, 2008) of the data-set available. This network analysis was applied to two types of metadata: (a) Mentions (@) and (b) Retweets (RT). The analysis was supported by ad hoc software built with Python and programmed to: (a) extract the said metadata from the database; (b) identify their reciprocal connections and (c) reconstruct their main network. The network analysis of @ and RT was functional for reconstructing the social structure of the communicative flow around the two radio brands, and was based on the *in-link* technique, which means that we focused on the @ and RT received by each user. We considered users with a higher level of in-link, or of *in-degree* (Hanneman & Riddle, 2005) as more *popular*, as they were mentioned and/or retweeted more frequently than other users.

'Most popular listeners' is not the same as 'most influential users', as measures of influence need to take empirical indicators of the ability to affect other users into account (Anger & Kittl, 2011).

The qualitative analysis consisted of two distinct qualitative content analyses (Johnstone, 2008):

(1) the reading and coding of the text of the Twitter Bios of the 100 most active users for each radio and
(2) the reading and coding of the text of 4000 randomically selected Tweets belonging to our first data-set in order to identify their affect expression (Arvidsson et al., 2015).

The process of classifying the Tweets was performed in a *grounded* and *iterative* manner (Glaser & Strauss, 1967), in the sense that the categories for analysis were not established from the start, but gradually emerged during the reading of the digital texts, through constant, collaborative examination by the three authors (Altheide, 1996; Holt, 1995).

The first content analysis was applied to a textual data-set composed of the group of texts of the Twitter Bios (Twitter Bios are texts with a maximum of 160 characters that allow Twitter users to tell their audiences who they are) of the 100 most active users for each radio, which had been previously identified through the network analysis.

The second content analysis was performed on a sample of 4000 Tweets: 2000 for each radio. These were extracted as a random sample from the 27,667 Tweets that were part of the data-set. These Tweets were manually coded based on the presence of expressions of positive or negative affect regarding the radio.

During the qualitative analysis we had daily frequent meetings where all authors discussed the relevance and applicability of coding criteria.

Findings

The data gathered and analysed in this paper show how the Twitter network publics of the two radios under study, one public and one private, behave very differently and, as we had hypothesized, present distinct internal structures. On 12 June 2014, Radio Deejay had 1.71 million followers on Twitter and an FM audience of 4.4 million listeners per day (one Twitter follower for every 2.57 analogue radio listeners), while RAI Radio 3 had 50,500

followers and an FM audience of 1.26 million listeners per day (one Twitter follower for every 23.76 analogue radio listeners).

The first significant difference we may note between the properties of the two radio networks is in the number of active users (those who had mentioned or retweeted the radio's account at least once during the month under study) who took part in a conversation on Twitter. There were 10,826 users that mentioned @radiodeejay, while 3637 users mentioned @radio3tweet. Even if @Radioeejay had more active users than @radio3tweet, the picture changes when related to the total number of followers. The followers of the public radio service station were found to be much more active than those of the private radio one: Radio Deejay's active users make up 0.72% of the total @radiodeejay account followers (1 out of every 138 followers), while RAI Radio 3's active users represent 7.14% of its total (1 out of every 14 followers).

The second important difference lies in the level of interactivity found in the two publics. Even though Radio Deejay has a higher number of users and produced a greater number of Tweets in the month under study (17,165 Tweets vs. 11,302 Tweets), the average number of Tweets sent by the active users of RAI Radio 3 is almost double that of the active users of Radio Deejay: 3.1 vs. 1.58.

The third difference, which is less apparent, is found in the varying use of RT. 7879 users retweeted @radiodeejay at least once during the month under study, amounting to 72% of that radio's total users, while 2885 RAI Radio 3 users did so, representing 79.3% of its total. If we take a closer look at the number of these users who retweeted twice or more during the month under study, we find a clear difference between these two publics: 507 (15.71%) are active users of RAI Radio 3, while 707 (8.55%) are active users of Radio Deejay. In addition to producing more Tweets per user, the public following RAI Radio 3 also RT more often. This means that users of RAI Radio 3 are more inclined to share and circulate content on Twitter that is produced by both the Radio and other listeners.

Network analysis

Through the techniques of network analysis, as described in Section 2.1: Methods, we have been able to reconstruct the networks of the two radio publics and study the sub-networks they can be broken down into. First of all, upon studying the connections among users expressed through the reciprocal exchanges of @ and/or RT, two distinct networks in terms of size emerged. As opposed to RAI Radio 3, Radio Deejay's network is very extensive, composed of 11,415 nodes and 31,889 edges; inside this, users exchanged an average of 5.6 @+RT (standard deviation = 118.0). Instead, the network of RAI Radio 3 is smaller, being composed of 4442 nodes and 13,799 edges;[2] within this network, users exchanged an average of 6.2 @+RT (standard deviation = 65.2). For each of these two networks we then calculated the modularity, which measures the tendency of a network to break up into a network of sub-networks, called clusters or communities (Blondel, Guillaume, Lambiotte, & Lefebvre, 2008). This was performed using Gephi's algorithm of community detection embedded in the Modularity function (Bastian, Heymann, & Jacomy, 2009). This function automatically regroups and clusters all those nodes (in our case, users) that create sub-networks within a larger network, as they are linked by a set of denser relationships (in our case, as they are more closely linked by reciprocal exchanges of @ and/or RT). This

analysis also produced results that showed a great variation between the networks of Radio Deejay and of RAI Radio 3, which we will now summarize.

The community detection analysis revealed that Radio Deejay's network (@radiodeejay) could be broken up into 159 clusters, where each cluster aggregates a different percentage of users that are interconnected by various relationships of exchanges of @ and/or RT. As the histogram in Figure 1 shows, the network fundamentally tends to divide into two clusters, which aggregate most of the users (Cluster 1 = 35, 63%; Cluster 2 = 28, 15%).

As we may observe in Figure 2, Cluster 1 (green) is a sub-network that mainly aggregates around the account @Djchiamaitalia (Radio Deejay's leading programme) and around @5SOS (a teen band hosted by the programme for an episode that was aired during the period under study). Cluster 2 is a sub-network aggregating around @radiodeejay, the radio's official account.

In the first cluster, users exchanged an average of 5.2 @+RT (standard deviation = 101.1). In the second cluster, users exchanged an average of 6.3 @+RT (standard deviation = 188.9).

The network of RAI Radio 3, @radio3tweet, could be broken up into 136 clusters; its frequency distribution is expressed in Figure 3.

These figures show that the network of @radio3tweet is much more united than that of @radiodeejay, given that: (a) it shows a lesser tendency to break up and (b) more than 50% of its users interacted with each other, being catalysed around a single cluster, Cluster 1.

In Cluster 1, which aggregates around the @radio3tweet account, users exchanged an average of 6.5 @+RT (standard deviation = 89.2).

In Cluster 2, users exchanged an average of 8.5 @+RT (standard deviation = 17.9). We may consider this Cluster to be a spontaneous sub-network created by the users/listeners, given that within it: (a) no official RAI Radio 3 accounts appear and (b) users with the highest in-degree are 'common users', such as @rosapolacco, @Monicanonno and @Rositaflorio (the top three) (Figure 4).

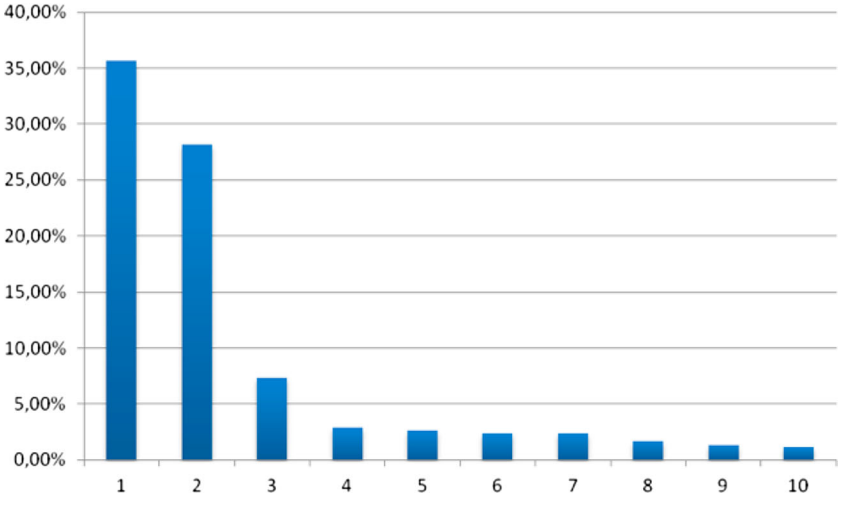

Figure 1. Percentage distribution of @radiodeejay network clusters (only the first 10 clusters are visualized).

Figure 2. Network of @radiodeejay. The different colours are determined by Gephi's community detection algorithm. The labels shown correspond to the nodes with the highest in-degree (number of @+RT received).

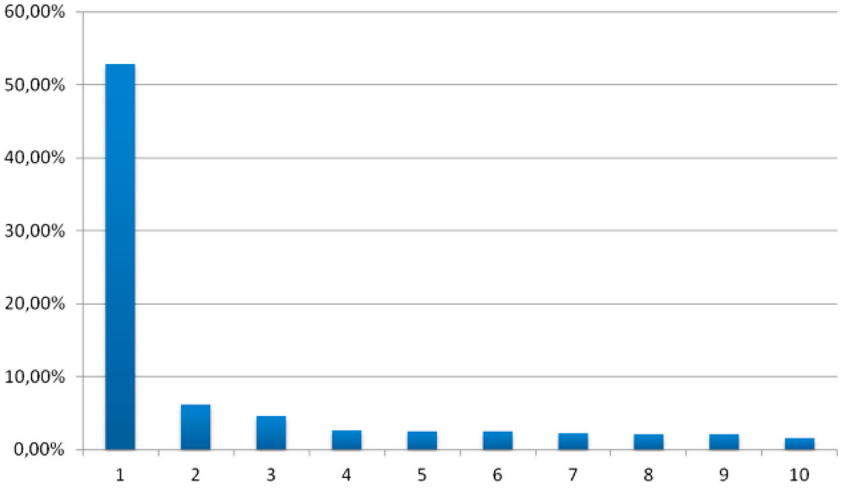

Figure 3. Percentage distribution of @radio3tweet network clusters (only the first 10 clusters are visualized).

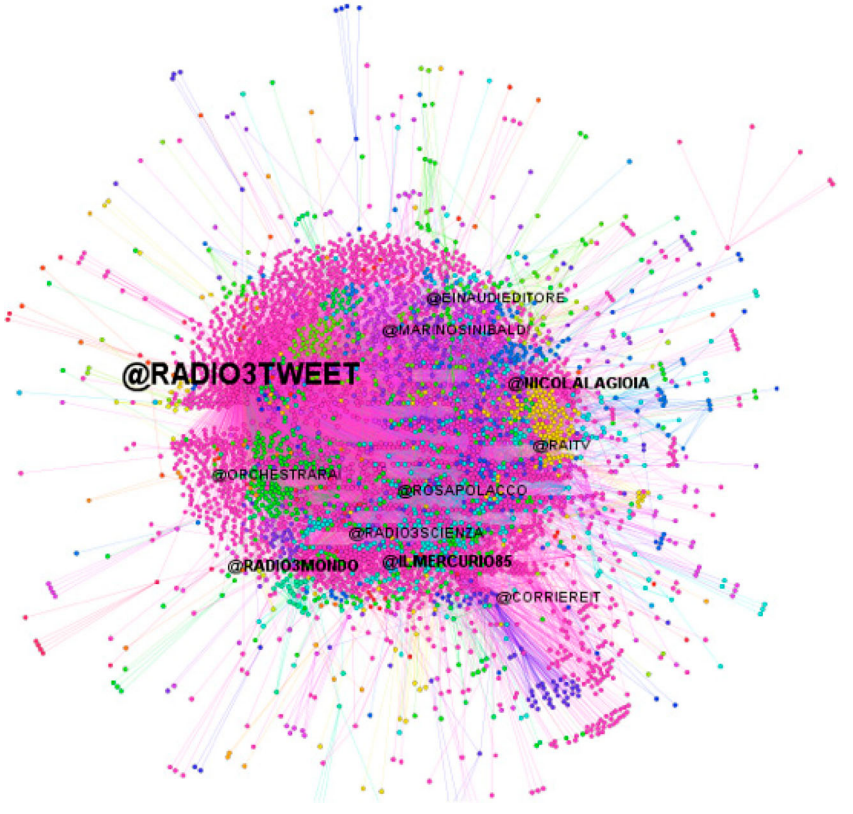

Figure 4. Network of @radio3tweet. The different colours are determined by Gephi's community detection algorithm. The labels shown correspond to the nodes with the highest in-degree (number of @+RT received).

Furthermore, if we compare the averages and standard deviations of both the two networks and the clusters they are composed of, we may observe how the standard deviation values of RAI Radio 3 are much lower than those of Radio Deejay: this means that the average number of interactions (@+RT exchanged) is much more equally distributed in the cluster of RAI Radio 3; these interactions are therefore slightly more horizontal.

The hypothesis that the network of public radio listeners is more horizontal and less hierarchical is also confirmed by another piece of data provided by the social network analysis: when the 100 most popular users (the first 100 users that received the highest number of @ and RT) of the two radios were isolated, we discovered that among the top most popular users of RAI Radio3, 14% are 'common'[3] listeners, those who are not connected to the radio in any way, while among the top 100 of Radio Deejay's listeners, 9% are common listeners. Moreover, the first 'common listener' in the top 100 most popular user's chart of RAI Radio 3 appears in the second position, while in Radio Deejay's chart it appears in position no. 52. This means that the followers of RAI Radio 3 mentioned and retweeted Twitter accounts belonging to common listeners more often than those related to Radio Deejay.

Once the top 100 most popular networked listeners of both radios were identified, we analysed their profiles and discovered that those of RAI Radio 3 had a greater average number of followers than those of Radio Deejay (1244 vs. 963). The network of the most popular listeners of RAI Radio 3 can therefore leverage a greater audience and could potentially activate a greater number of social relationships.

Content analysis

In order to respond to the question posed by Rogers in the introduction to this paper, 'Could the information contained in profiles on social networking sites provide different insights into the composition and characteristics of publics?' (2009, p. 35), we have performed different types of content analysis on texts (Tweets) produced by active users, as explained in Section 2.1: Methods. Through the social network analysis, we first isolated the top 100 most active users (those Tweeted the most during the month under study) for each radio, then applied the content analysis to the texts generated by the most active users in order to present themselves on Twitter: the Twitter Bios. Twitter Bios are Social Networks Profiles that allow users to present themselves. Liu (2007) frames them as places where users perform their self. As underlined by Liu (2007):

> The virtual materials of this performance are cultural signs – a user's self-described favorite books, music, movies, television interests, and so forth – composed together into a *taste statement* that is 'performed' through the profile. By utilizing the medium of social network sites for taste performance, users can display their status and distinction to an audience comprised of friends, co-workers, potential love interests, and the Web public. (p. 252)

We performed a qualitative analysis of the Twitter Bios of the top 100 most active users, and discovered that the most active users of RAI Radio 3 are much more careful about presenting their public image than those of Radio Deejay. Those of RAI Radio 3 take full advantage of the 160 characters allowed by Twitter to present themselves, while those of Radio Deejay often use much briefer descriptions. The most active users of RAI Radio 3 find it important to indicate their cultural capital, including their educational qualifications and profession, while the majority of the most active users of Radio Deejay do not present themselves as public figures, but only as private citizens.[4] Very often, they do not report their surname but only a first name, and tend not to report their educational qualifications or profession: only 22 out of 100 Radio Deejay users reported their profession. The three most common professions among the most active users of Radio Deejay were reported as: student (81%), driver (4%) and videomaker (4%), while the most common professions among those of RAI Radio 3 were: journalist (8%), freelancer (8%), translator (7%), anthropologist (7%) and web developer (7%). This content analysis of Twitter Bios also reveals a clear difference in the types of topics the most active users are interested in. The most frequent keywords in the descriptions of themselves in the case of the most active users of RAI Radio 3 are: current affairs (28%), politics (22%), art (18%), music (14%), books (9%) and literature (9%), while those for Radio Deejay are: pop music (28%), Radio Deejay (21%), 5SOS[5] (21%), Emma[6] (15%), football teams (10%) and TV programmes and series (5%). The edited selves of the networked listeners of RAI Radio 3 reflect a class that is creative and highly educated, one that wishes to be recognized for its knowledge and professional skills. Instead, those of Radio Deejay

Figure 5. A Tweet including 'emotional' content from a follower of @radiodeejay. Text: '@radiodeejay @triomedusa And every morning it keeps me company on my way to school.. thanks trio medusa'.

Figure 6. A Tweet including 'emotional' content from a follower of @radio3tweet. Text: '@radio3tweet Today without #laBarcaccia (a satirical talk show about opera, Ed.) I didn't digest my lunch. And tonight without #HollywoodParty, how will I get home? Sigh'.

present themselves like fans: of football teams, musical groups or television series. They lack a precise professional identity, but display a clear fan cultural identity (music, radio, TV, football).

A second kind of content analysis was applied to a sample of 2000 Tweets for each radio, for a random sample totalling 4000 Tweets, as explained in Section 2.1: Methods. On this sample of 4000 Tweets, we manually coded the affective intensity of the messages, or which messages contained affective messages (positive or negative) regarding the radio.

The analysis revealed that, during the month under study, a greater emotional bond was shown between Radio Deejay and its users, who often thanked the radio for keeping them company, expressing their approval with compliments and words of appreciation for programmes and hosts. 100 Tweets (5%) of this type were registered from the sample of 2000 Tweets analysed. This analysis excluded messages aimed at singers and musical groups that were hosted by the programmes, which were considered as not pertinent because they were not directed primarily at the radio. We therefore only examined the messages aimed specifically at Radio Deejay, as Figure 5 shows.

Instead, this study found a lesser tendency for RAI Radio 3 users to express their emotions regarding the radio: only 12 Tweets of this type (0.6%) out of a total of 2000 were identified (Figure 6).

Discussion

Results from our analyses demonstrate that the two radios under study have publics with very different behaviour and characteristics, which could not have been detected without the social network analysis and the DM approach. These findings show a clear polarity between the two radio publics, with differences in their network structures, social networks, cultural capital and even in their affective expressions. This research illustrates

the role played by the public service radio in creating new social relationships around its content, which is one of the most important tasks of a public service. During the month under study, RAI Radio 3 performed better than Radio Deejay as a public space where listeners could create new social relationships, establish new connections and exchange content (Tweets and RT). The social network analysis showed how the Twitter profile of RAI Radio 3 worked as a catalyst for social relationships among its listeners, providing the opportunity for its listeners to connect with each other through the discussion and comments of its own radio content. This gave life to a more horizontal network, where communication flows in a way that is more distributed and less broadcasted from the top, where the top is represented by the Twitter accounts of the radio, its personalities and its hosts. The followers of the RAI Radio 3 account tend to mention and retweet other peer listeners, therefore exchanging content and establishing new connections with them, as opposed to those of Radio Deejay, who interact more directly with the radio, its hosts and personalities, as our analysis of the 100 most popular followers has shown. Although the public service station has many less followers than those of the private station, they are proportionately more *noisy*, producing more content (Tweets and RT) than the others and participating more in dialogue with the radio.

Findings show that the social networks of the most popular users of RAI Radio 3 are more extensive than those of the top Radio Deejay users. This means that RAI Radio 3 has list of very popular users who are potentially capable of mobilizing a greater network of users than that of Radio Deejay. This research suggests (though it does not prove) the hypothesis supported by Bonini (2015) that the network of social relationships, uniting both the radio with its Twitter followers and its followers with each other, could represent a form of social capital of the radio itself. While the wider (and invisible) radio public, as charted by audience rating companies, still constitutes the radio's economic capital, the networked publics of a radio could be considered its social capital, the meaning of which is well explained by Bourdieu and Wacquant (1992) when they define social capital as 'the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalised relationships of mutual acquaintance and recognition' (p. 14). Proving that the network of social relationships of a Twitter profile for a radio (or any other media) constitutes real social capital for the media itself could be a very interesting line of research for future audience studies. Data gathered for this work suggest that this is a hypothesis with strong potential (though this can only be proved with further empirical investigation). What does seem clear is the different values obtained by followers within the two networks: according to the social network analysis, the nodes that constitute a network, according to the position they hold within the network and the links they have established with other nodes have different weights and therefore different values (Hanneman & Riddle, 2005). If we apply this idea to the network of the Twitter followers of a radio, we can therefore infer that each node (follower/listener) will have a different weight within the network. Our findings have shown that, in these two networks, there are indeed nodes, namely followers/listeners, who have more important roles than others do, and therefore their attention is worth more than that of others, because they are more capable of attracting the attention of their followers and amplifying the message. Today, the audience network of a radio is composed of many (more or less) small broadcasters.

Moreover, our data have highlighted not only the fact that the nodes that compose the two networks analysed have a different social network and a different broadcasting potential, but also that these nodes exhibit a different cultural capital.

The analysis of the professions and interests contained in the Bios of the 100 most popular users of RAI Radio 3 and Radio Deejay display a clear distinction in terms of the cultural capital available to each of them. We observed different types of self-presentation and self-branding (Marwick, 2013) practices among the followers of the two radio stations analysed. RAI Radio 3 users present themselves as people with a high cultural and professional status, holding interests consistent with this status (politics, current affairs, art, literature, global issues), while Radio Deejay users describe themselves as private citizens with passions linked to pop culture (music bands, football teams, pop celebrities), and do not display their cultural status. Following findings by Zillien and Hargittai (2009), our data suggest that high-status and low-status individuals cultivate different forms of self-presentation and seek different forms of topics on Twitter. RAI Radio 3 followers have, on average, larger networks of followers (more social connections) and use RAI Radio 3 as a public stage where they can display their cultural capital, a space for showing off their 'digital distinction' (Zillien & Hargittai, 2009) and finding like-minded people to interact with.

The data analysed thus far bring us back to the question posed by Rogers (2009), 'Could the information contained in profiles on social networking sites provide different insights into the composition and characteristics of publics?' (p. 35), allowing for a positive response. Indeed, from the content analysis of users' Tweets and of their strategies of self-presentation, we may observe how very different public spaces emerge around the accounts of @radio3tweet and @radiodeejay (Papacharissi, 2002). The fact that the users of @radio3tweet on the one hand create a denser and more compact social structure, and on the other display their intellectual skills (both in their profiles and in the content of their Tweets), allow us to hypothesize that, around @radio3tweet, a space is created that users employ as a platform for *self-branding* (Marwick, 2013). They may then use this space to exhibit their cultural capital and search for new social connections through which they may eventually spend that cultural capital (Bourdieu, 1985; Gandini, 2015). In this sense, the public of @radio3tweet could carry out an *economic function* for its components. Vice versa, the fact that @radiodeejay users create a looser social structure, and tend to display their cultural *tastes* (Arsel & Bean, 2013; Liu, 2007) and their affect more than their cultural capital lets us hypothesize that, around @radiodeejay, a space is created that is used as a platform for *self-narration* (Page, 2012; Schau & Gilly, 2003), one where they may make public and visible what Papacharissi calls *private sociality*, meaning a narcissistic sharing of one's own opinions and personal experiences (Arvidsson, 2013; Papacharissi, 2012). Given the great number of @radiodeejay followers, this narcissistic sharing obviously has a higher probability of circulation and publication.

In addition to these differences in social structure and cultural capital, the two groups also vary in their public display of affect: the networked listeners of Radio Deejay are more inclined to express their emotions. However, these manifestations of feelings and emotions do not make them a crowd, as Le Bon conjectured (1895), but a public in all respects. The networked listeners of RAI Radio 3 and Radio Deejay are no longer the heterogeneous, anonymous crowds described by Le Bon (1895), nor the individually indistinguishable alienated individuals described by Blumer (1933) in the early age of mass communication.

They are not crowds that act emotionally as a collective mind (Le Bon, 1895); on the contrary, they are groups of people that interact, with different reactions to the stimulations of media. The behaviour of these networked listeners coincides with studies by Katz and Lazarsfeld (1955), who emphasized the importance of peers in constructing the meaning of media messages. Lazarsfeld, as Butsch (2008) noted, 'moved toward a paradigm that focused on audiences as people interacting as groups, rather than as individuals manipulated by media' (p. 123). Networked listeners must be interpreted as a public, according to the interpretation of Tarde (1901), one of the first sociologists to use this term in relation to media: 'a public is a mediated association amongst strangers who are united by a however momentary affective intensity that is directed towards a common thing' (1901, p. 374). For Tarde, a public must possess two fundamental characteristics: it must be scattered in space, but connected through a medium and produce conversations. Arvidsson and Bonini (2015) have already highlighted how Tarde can be useful in order to understand the meaning and value embedded in networked publics, focusing on the value of the affect produced by audiences. However, Tarde's ideas were best interpreted and updated by Papacharissi (2015), who first used the term 'affective publics' to describe networked publics. She defines affective publics as 'networked public formations that are mobilised and connected or disconnected through expressions of sentiment' (p. 125). Tarde's idea that the public is composed of displaced strangers united by feelings towards something that is shared is reworked by Papacharissi (2015), who adapts it to the context of contemporary digital media, capable of supporting and transmitting emotions: 'Twitter serves as a conduit of interconnected structures of feeling' (p. 133).

The empirical observation of the behaviours of the networked listeners of RAI Radio 3 and Radio Deejay leads us to define both publics as affective publics, but with different public displays of affect. Both publics manifest affect for radio and its listeners, even simply by retweeting a message. By retweeting a message, a user wants that message to be spread because s/he feels that it deserves to be read/discussed or because that message provoked an emotional reaction (boyd, Golder, & Lotan, 2010). As we have seen, the active users of RAI Radio 3 are more prone to retweet (79.3% of them do so, as opposed to 72% of Radio Deejay active users), and they also tend to retweet more than once (15.71% vs. 8.55%), but the networked listeners of Radio Deejay make a greater use of explicit expressions of affect (5% of Tweets (n = 100) vs. 0.6% (n = 12) of those of RAI Radio 3). The public of Radio Deejay is a bit more inclined to publicly manifest its affect for the radio, while that of RAI Radio 3 is more reluctant. The public of RAI Radio 3 behaves more rationally and less emotionally, and is more oriented towards sharing and amplifying worthwhile information. Instead, the public of Radio Deejay is more similar to a group of fans, discussing their popular cultural tastes and freely expressing their feelings and emotions about what they like. The connection between Radio Deejay's public and the radio station itself is similar to fans of a musical band, while that of RAI Radio 3 resembles the experience of a citizen who publicly approaches and discusses others' opinions.

Furthermore, we may note a correlation between reduced cultural capital and a greater inclination towards publicly manifesting one's affect, though this observation must be subject to further investigation. Here as well, we believe that the theme of the relationship between cultural capital and the manifestation of one's emotional connection with a medium or brand could be an interesting line of future research. What we can say is

that, in our study, private radio has been able to generate a stronger affective response than that for public service radio. If we were to call this affective intensity generated by the radios 'affective capital', we could then say that the private radio accumulated a greater affective capital within its Twitter network than the public radio. Papacharissi (2015) maintains that digital media 'invite affective engagement' (p. 23), and that the affective intensity it produces 'can be transformed into value, and the tendency to evaluate labour or play by virtue of the intensity behind the feeling with which it is performed produces an affective economy' (p. 23). In the affective economy of digital media, the affect generated by engagement represents a form of affective capital, which could be turned into action, as Papacharissi and de Fatima Oliveira (2012) have shown in their study of the practices of collective and collaborative storytelling that unfold within the networked publics dedicated to citizen journalism on Twitter. Papacharissi and de Olivera also consider affective Tweets in their analyses,[7] highlighting how these are functional to the creation of what we may call *ambience*. Ambience is a fluid conversational space, with more emotional than informative content, that serves '[to sustain] cohesion even when there [is] no news to report' (Papacharissi & de Fatima Oliveirai, 2012, p. 12), or to keep the public 'alive' even in 'unproductive' moments. In this sense, we may consider ambience as both the depository and the field for cultivating affective capital, a raw 'material' (from the communicational point of view) that, if successfully promoted through ad hoc activities for emotional management (Stage, 2013), can be converted into action. The impression that this capital is already somehow cultivated and promoted by Radio Deejay is suggested by a number of observations. Radio Deejay is very skilled and effective at mobilizing its public of listeners in mass events offline, which are mostly sports and/or benefit events. For example, Deejay Ten is an amateur footrace the radio organizes in all the main cities of Italy, whose Facebook page counts 21,397[8] fans and whose last edition in Florence (18 May 2015) catalysed approximately 15,000 participants.[9]

Conclusions

This research has explored a number of new methodological possibilities for observing and understanding the behaviour of audiences and publics, moving beyond traditional quantitative and demographical analyses and highlighting new parameters for an evaluation of publics that is less based on quantitative criteria. As Rogers (2009) claimed, 'social network sites offer new opportunities of research, and perhaps especially for research into publics' (p. 35). We believe that this research is a demonstration of Rogers's hypothesis, which, if accepted, would shift attention towards the post-demographical characteristics (interests, tastes, social connections and cultural capital) of publics, or, as Gans (1999) already called them, 'taste publics'. What has emerged from this work is the idea that networked publics use content broadcast by radios to maintain pre-existing social relationships or to create new ones and to show off their cultural capital or their fan cultural behaviours. The visualization and materialization of the social connections that bond single listeners to a radio, obtained through the application of DM, allows us to reassert the social value of radio: radio connects not just listeners to information, but listeners to other knowledgeable people. However, public service radio connects and generates different social networks from those of a private radio.

An approach that we have attempted to employ in the specific field of Twitter publics for radio may be able to revamp audience studies through the gathering, mapping and elaboration of the data produced by noisy digitally networked publics, not only in relation to radio but to other media as well.

Results emerging from the analysis of the networks of Twitter profiles and of Tweet content suggest us to hypothesize the existence of two different publics around @radio3-tweet and @radiodeejay, which possess three different types of capital: social, cultural and (what we call) affective. We may observe how the public of @radio3tweet presents itself as possessing greater social and cultural capital than that of @radiodeejay, which in turn presents itself as a public with greater affective capital.

Once these three forms of capital have been acknowledged, their existence and relevance for radio brands and their listeners must be examined through further in-depth empirical research, adding traditional qualitative methods of social research (like in-depth interviews with networked listeners and participant observation) to DM. However, this brings an ethical issue to light: *Do scholars and broadcasters have the right to* 'exploit' *these kinds of capital? If so, how? What type of value must radios return to the publics of listeners who are the actual producers of this capital?*

If these kinds of capital were placed under more in-depth academic examination, and if they were fully understood by the directors and producers of radio (and of the media in general), this could result in the traditional models of audience evaluation being placed under discussion, models which have mostly been based on quantitative values as the sum of users' attention in today's eyeball economy, as well as on the analysis of audiences' demographic composition. Beginning to recognize the value of publics, not only for the amount of attention they provide to media, but also for the properties of their behaviour within a digital network, could represent a paradigm shift that is fundamental to understanding their value. However, this paradigm shift presents considerable risks. If audience research must be broadened to include the understanding of the behaviour of networked publics, the extraction and analysis of data produced by networked publics within the commercial parameters of social media represents a further step towards the commodification of audiences theorized by Smythe (1981) and elaborated by Fuchs (2010). More in general, it represents a step in the process of the capitalist subsumption of life (Dean, 2009). A commodification that is no longer conveyed, as Smythe and Fuchs maintain, by the subsumption of the public's attention – what they call 'audience work' – but, as Arvidsson and Bonini (2015) maintain, by the subsumption of passions and emotions of the networked publics.

The application of DM to audience research raises important ethical issues that must still be explored in depth. Further research and debate is needed on the ethical questions raised by digital data harvesting, as well as on the systematization of studies dealing with the behaviour of the networked publics through DM, of which this paper is only an initial exploration.

Notes

1. Software was provided by the Digital Ethnography Centre of the State University of Milan (http://www.etnografiadigitale.it/); we thank them for their collaboration.
2. Nodes are represented by the users, which are units marked with @ (e.g. @Valentinacons). The edges are represented by the connection between users, expressed by the exchange of @ and/or

RT. In this case, there are more nodes than active users (e.g. Radio Deejay = 10,826 active users vs. 11,415 nodes), as each user can mention more than one user at a time in a single Tweet. These mentioned users can also not be active users, namely those who have not contributed to the creation of the communicative flow of Tweets surrounding @radiodeejay. This is a very common occurrence when studying the graphs on Twitter, which are *direct*, or *asymmetrical* by definition (if A is a follower of B, the opposite is not necessarily true, as it would be on Facebook; or if A mentions or retweets B, the opposite does not necessarily happen etc.). The *density* of the networks of the two radios was also calculated. The density of a graph $G = (N, E)$ is the measure of the connection between the edges (E) and the maximum number of possible arches between the nodes (N). The density is equal to 1 (or the maximum) if all the nodes are connected with each other – vice versa is 0. In our case, the network of RAI Radio 3 resulted as being denser than that of Radio Deejay, although the difference was insignificant: 0.0007 as opposed to 0.0002.

3. We define 'common listeners' as those followers whose Twitter Bios show that they are in no way connected to the radio they mention in their Tweets, who do not work for it and who are not public personalities, but private citizens. In order to verify that there was no professional relationship underway between users identified as 'common' and the radio, we also performed research outside of Twitter.
4. For an example of the different displays of cultural capital of @radiodeejay and @radio3tweet users, please consult the following Twitter accounts: @laMarsi (a follower of @radiodeejay, accessed on June 9, 2015): '19+2. I lived three apocalypses. Dream out loud. Emma's lover. Student.'; @ilmercurio85 (a follower of @radio3tweet, accessed 9 June, 2015): 'Graduate of @Cafoscari (University of Venice, Ed.) and @ScuolaHolden (a private creative writing school, Ed.). I write for @make_in_italy and @startup_italia. I love stories of innovation and @radio3-tweet. I wake up with #primapagina'.
5. A famous international pop rock music band from Australia.
6. A famous Italian pop music singer.
7. Here are some examples of particularly phatic Tweets analysed by Papacharissi and de Olivera: 'Proud of you Egyptians!' or 'Good morning sunshine … Good morning my sweet lovely Egypt'. In the specific article 'Affective News and Networked Publics', Papacharissi and de Fatima Oliveira study the above-mentioned practices of storytelling during the Egyptian 'revolution' of 2011.
8. Accessed on 6 June, 2015.
9. See: http://www.deejay.it/news/deejay-ten-in-15mila-fra-i-coriandoli-viola/433633/?ref=fbpj and: http://www.deejayten.it/classifiche/. Accessed on 9 June, 2015.

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No potential conflict of interest was reported by the authors.

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