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The impact of TV rating on Twitter's activity: Evidence for Chile based on the Teletón 2012

El impacto del rating televisivo sobre la actividad en Twitter: evidencia para Chile sobre la base del evento Teletón 2012

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ABSTRACT

Does television rating have an impact on Twitter's tweeting? The emergence of digital social media is changing the television industry practices. Particularly, TV channels are explicitly including social media tools to interact with their audience. These efforts are mostly based on intuition rather than on evidence. To contribute to identify the actual effect of TV programming on Twitter's activity, this study analyzes the relationship between TV rating and the tweeting during the Teletón 2012, an event transmitted by all Chilean channels simultaneously. The results suggest a statistically positive impact of television rating on Twitter's tweeting. Specifically, during Teletón 2012, a rise of 1 point on television rating per minute increased tweeting by 1.5 tweets per minute on average and 6 tweets per minute during prime time.

Keywords: audiences, rating, twitter.

RESUMEN

¿Tiene un impacto el rating televisivo sobre el volumen de actividad en Twitter? El surgimiento de medios sociales vía Internet está modificando las prácticas en la industria televisiva. En particular, los canales de televisión están integrando en sus programaciones de forma explícita la interacción con las audiencias vía medios sociales. Estos esfuerzos se están realizando motivados más por la intuición que por evidencia respecto a la eficacia de los mismos. Para contribuir a identificar el real impacto de los contenidos televisivos sobre la actividad en el medio social Twitter, este estudio propone el análisis estadístico de la relación entre rating televisivo y actividad en Twitter durante la transmisión de un mismo evento por todos los canales de televisión, la Teletón 2012. Los resultados sugieren la existencia de un impacto positivo y estadísticamente significativo que vincula el rating televisivo con la actividad en Twitter. Específicamente, durante el evento Teletón 2012, un aumento de un 1 punto del rating televisivo significó incrementos promedios de 1.5 tweets por minuto para el conjunto de la transmisión y de 6 tweets por minuto en horario prime.

***Palabras clave**: audiencias, rating, twitter.*

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INTRODUCTION[1]

Access to the Internet has transformed the attention that audiences place on the content generated by traditional mass media (radio, press and television). If it used to be a relatively passive consumption, nowadays through various platforms such as Facebook, Twitter and YouTube it has become an interactive experience. The rapid expansion in the use of these new platforms has also transformed them in mass communication media, where each user is a content generator, acquiring the name of social media or selfmedia (Castells, 2009). As a result, social media are changing the way in which public attention is molded in contemporary societies, with repercussions not only in the media industry, but also in other domains of social life (Dalgreen, 2009). As these changes are recent, we still do not know how traditional media and new media relate and, therefore, remains an open question whether they enhance or replace each other in capturing the audience's attention.

In the specific case of television, the new ways of interacting with television content have been called multiscreen experiences, because to the attention paid to the television screen contents we add the directed to the content on the screens of computers, smartphones, tablets, etc. (Gibs, Shimmel, Kaplan & Schilling, 2009). Studies suggest that multiscreen experiences are on the rise. According to ComScore (2012) 17% of the population was multiscreen by the end of 2011 in the United States. For the first half of 2012, Smith and Boyles (2012) estimated that 52% of users of devices connected to the Internet (especially smartphones) use them to interact while watching television, particularly to keep busy during commercials. By the end of 2012, Google (2012) obtained higher proportions: 77% of people who watch TV use another electronic device at the same time.

These rapid changes in audiences may affect both negative and positively the attention put in television content. On one hand, the new multiscreen audiences are potentially less attentive to the programming of television channels, due to the almost unlimited range of content that can be accessed online, but, on the other, Internet has also allowed the television industry to use new ways to increase their interest towards the content offered. As the advertising model on which the television industry rests depends on the attention of audiences, to measure these effects, identify the segments in which they are higher, at what times, for what type of content, etc., have transformed into challenges of first importance to the industry.

The evidence generated so far seems to indicate that the new multiscreen environment represents an opportunity to access most loyal segments of the market. For example, ComScore (2012) shows that multiscreen consumers accessing content television through online videos are exposed for longer periods to the television content than traditional audiences. With data for the United States, Webster and Ksiazek (2012) provide evidence for the existence of a concentration of the audience's attention in what they call a *Matthews effect*[2] of new technologies on the industry. I.e. the increased content offer does not fragment the audience towards a multiplicity of microcosm, each with few but loyal viewers, but increases the routes through which a few providers capture greater volumes of attention. For the authors, this is due to three reasons. First, the dramatic cost reduction allows audiences to access massively higher quality content, leaving little space for lower quality content to capture the attention of potential viewers. Second, media consumption has a strong social component that encourages people to act in cascade in the consumption of content that others are already consuming. Finally, the multiplicity of offers generates a demand for recommendations on what contents are attractive, and again, those contents which have more quality or are being seen by more people will tend to receive more recommendations.

Considering the above, it is expected that TV programs with most popular content have positive impacts on the interaction of the audiences' trough other screens. I.e., an expected implication is that part of the audiences' activity on social networks is motivated by the contents seen in parallel or previously on television, and that should be especially noticeable in high-rating programs. This has been the intuition that the television industry has had incorporating different advertising strategies in order to bring audiences to their websites, Facebook and Twitter accounts. In particular, television channels are incorporating increasingly more spaces for dialogue with audiences via social networks in the design of their transmissions. It is common to see references to what is happening

on Twitter or invite audiences to see more details on their websites or Facebook accounts. Parallel to this a fledgling market of measuring of the activity on social networks has emerged, which is offering various assessment and monitoring services. However, despite the fact that the television industry is definitely moving toward the multiscreen interaction with their audiences, the feeling shared by the actors of the industry remains that they should be on social networks, but without much clarity on how to do this or the real impact that effort has.

Among the various existing digital social networks, Twitter stands out as particularly useful to monitor the behavior of the new television audiences because the structure of the network encourages users to make publicly visible comments. This allows developers and researchers to access en masse to the contents that occur in the network. In this regard, analyzing the activity on Twitter and the rating in television series in the United States during the beginning of a season and during subsequent episodes, Nielsen (2013) found positive correlations between the two variables, which give sustenance to the intuitions that have helped companies in this industry to design and invest in strategies for social networks. In this study, in the United States, an increase of a rating point correlates with increases of 4.2% and 8.5% in the young adult segments (18-34) and adults (35-49), respectively.

In the Chilean context, there are few investigations. Using data from rating and total daily tweets volumes regarding *Mundos opuestos*, the reality of Canal 13, *Rojo* (2012) shows that there are positive correlations between both series. Furthermore, Fábrega, Paredes and Vega (2013) identifies three distinct patterns: i) the formation of tweeting communities around television programs; (ii) positive association between the minute-to-minute rating and tweets per minute in certain programs of debate (*Tolerancia cero* of Chilevisión) and journalistic (*Esto no tiene nombre* of TVN); and (iii) high levels of zapping on Twitter (i.e. users who comment on Twitter about various programs that are transmitted in parallel) in percentages ranging between 30% and 45% approximately between Twitter users during prime time.

This work intends to contribute to the emerging literature on new multiscreen audiences through an econometric estimation of the rating effect on the Twitter activity in the Chilean case. The specific objective is to measure the effect of TV rating on the content that users share on Twitter, under the null hypothesis that these impacts exist and are statistically significant.

The rest of the document is organized into three sections. The second describes the methodology and data used. The results are presented in the third. The fourth section presents the conclusions and limitations of the study, as well as proposals for future research.

METHODOLOGY AND DATA COLLECTION

To measure the effects of TV rating on Twitter activity, at least two important methodological challenges must be faced: Problems of endogeneity and measurement problems. In relation to endogeneity problems, it is expected, on one hand, that greater audience increases the volume of interaction in social media commenting what they are seeing, have seen, or expect to see on television; on the other hand, it is possible that people who are interacting through social networking may be motivated to turn on their TVs because of the comments being made on these networks. I.e., if what we want is to identify the effect of TV rating on Twitter activity, there is the possibility that at least part of the identified phenomenon, actually belongs to effects of the interaction on Twitter about television consumption.

In relation to the measurement, the methodological challenge to evaluate the effect of audiences on the interaction through social networking is that usually there is not one, but multiple television audiences, because several television signals are being transmitted at the same time. For this reason, measurements of the impact of rating on Twitter activity when several different rating programs are broadcast in parallel could underestimate the overall effect of rating on the volume of Twitter activity, since the potential effect that rating has on audiences must be weighted by the cross effects that the competition for ratings generates between different channels. Fábrega, Paredes and Vega (2013) show that zapping on the television comments on Twitter is relevant, in quantities ranging between 10% and 25%, approximately.

These methodological difficulties could be lowered if information is obtained from the Twitter activity associated with events that all television channels transmit at the same time. In such a scenario, there is a single television signal and a single rating, making it feasible to measure how variations in this rating may or may not be associated with variations in activity on Twitter. That is why we propose to analyze the relationship between rating and Twitter activity minute-by-minute during a particular event of high audience and transmitted simultaneously through all channels of broadcast television. Such design allows to observe how the activity on Twitter vary minute to minute in reaction to changes in rating, in a kind of natural experiment in which the cross effects of rating between programs are controlled. An event that complies with such characteristics is the Teletón, a charity event where broadcast channels share the same transmission in a continuous period of approximately 27 hours.

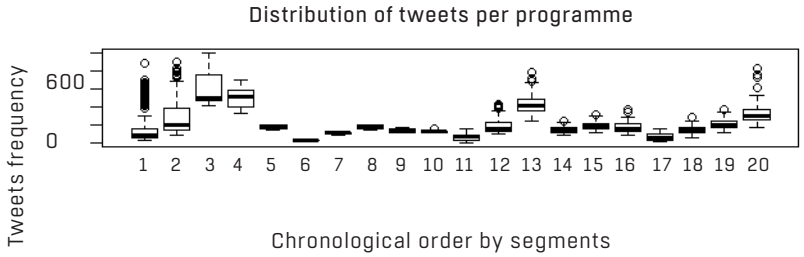
Our suggestion is that while the endogeneity is not completely resolved by analyzing the activity on Twitter during the broadcast of Teletón 2012, it can be argued that during the event the reverse effect (from Twitter to TV) is insignificant. According to Time Ibope, the company responsible for evaluating television rating in Chile, in 2009 a rating point amounted to 63,000 people or about 18,000 households, approximately[3]. In contrast, Twitter activity about a television program usually reaches some thousands of tweets. For example, Fábrega, Paredes and Vega (2013) analyzed the relationship between rating and Twitter activity for several television programs in prime time during August 2012, obtaining volumes in a range of 3,000 to 12,000 tweets, with averages of two tweets per person, approximately. Therefore, as a first approach to the relationship between activity on Twitter and television rating, it is expected that, in general, the main effect is from the rating to the activity on Twitter. While that cannot be guaranteed, and future research should consider other methodological strategies to improve the identification of the effect, we suggest that when focusing on an event such as Teletón, endogeneity problems can be minimized, since it is a program in which all television channels are broadcasting the same signal at the same time. This fact not only allows to evaluate the activity on Twitter during an event with high audience, but also minimizes the effect of zapping and competition by TV rating, allowing to obtain a single rating measurement and, by default, a more limited set of concepts to monitor in Twitter's activity (we state that it minimizes and not eliminates zapping, because there is still a rating competition between broadcast and cable channels).

For the above purposes, we collected tweets that include any of the following terms: teletón, teleton, #Teletón2012, #teleton2012, #purocorazon, @teleton, #levantatepapito, #vedetton, 24500-03, #bancodechile, parapaparapapapa, Kreutzberger, DonFrancisco, unsolocorazon, camiroaga, bancodechile, niñosímbolo and combinations of the above between November 30 and December 2, 2012, covering the entire period of the transmission of the event. The information collection was made using the API Streaming of Twitter. The base generated was subsequently filtered to eliminate all tweets related to the Uruguay Teletón event, which took place at the same time. The filter removed all tweets with references to the anchorman of the event, the main cities of Uruguay, to the football teams in the country who participated of the event, and all the tweets that were written from Twitter accounts whose owners were located in Uruguayan cities. Once the definitive database was obtained, the volume of tweets per minute was calculated. The database was supplemented with information on the minutes in which began and ended each of the sections that the Teletón had (for example, "opening", "humor in Teletón", "the all-nighter", "the Chile breakfast", etc). We obtained from Wikipedia the information about the hour of beginning and end of each section of the event[4].

RESULTS

527.611 tweets on 1,710 minutes, according to the criterion of data mentioned in the methodology, were published during the broadcast of Teletón. The average number of tweets per minute (t/m) was 207,8 t/m with a median of 157,5 t/m, reaching a maximum of 999 t/m during the humor space on the first night of the Teletón and a minimum of 9 t/m near 9 o'clock in the morning. Moreover, average rating[5] during the transmissions was 41,78 points, median was 43,7, the maximum rating was reached during closing ceremony with 75 points and minimum was 0,53 points at dawn on Saturday, December 1. Figures 1 and 2 show the distribution of tweets per minute during the segments transmission and the periods of the day, respectively. In both cases, each rec-

Figure 1. Tweets per programme

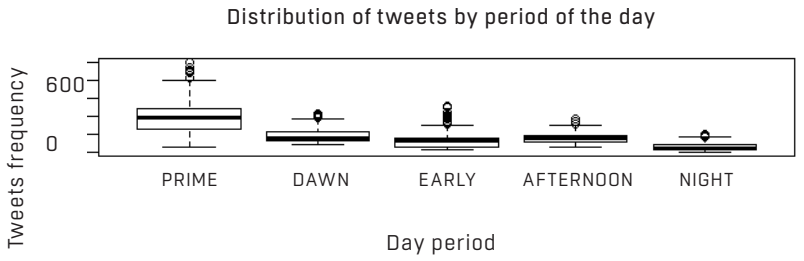


1) Opening	6) C3	11) C5	16) Mr. Teletón
2) Commercials-C1	7) All-nighter	12) News	17) C8
3) Humor	8) Breakfast	13) C6	18) Prime time show
4) C2	9) C4	14) Goal	19) Newscasts
5) Vedetón (strippers show)	10) Mundo arriba (Up the world!)	15) C7	20) Closing ceremony

Note from Figure 1: On the horizontal axis the 2012 Teletón segments are presented in chronological order. Each segment is described in the top right corner. The segments referred to as C1, C2,..., C8, are advertising segments.

Fuente: Elaboración propia

Figure 2. Tweets by day period



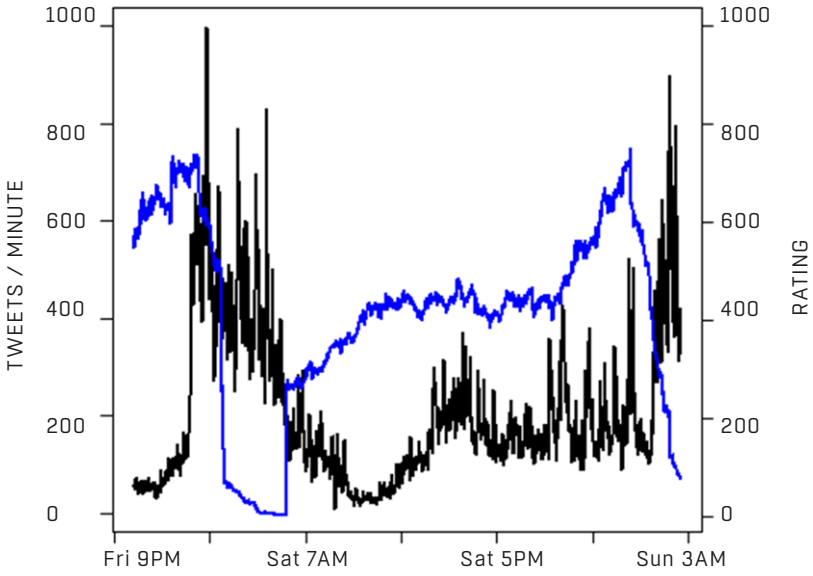
Source: Own ellaboration.

tangle represents the range of tweets per minute during each segment of Teletón which concentrates 50% of the data, and the segments above and below each rectangle define the range where data of a standard deviation from the median of tweets per minute locates in that segment (identified as a horizontal line of greater thickness in each of the rectangles). As seen in Figure 1, the dispersion of tweets per minute between different segments of the Teletón was high. The largest volumes of tweets per minute were recorded at the start of the transmissions, at the start of the afternoon of the second day of transmissions and during the closing ceremony. Particularly, the humor space of the first night of transmissions generated around 600 tweets per minute in average, reaching at some points 1000 tweets per minute.

On the other hand, it should be recalled that most of the Teletón occurs during a Saturday. In this regard, Figure 2 shows clearly that activity in Twitter is greater at prime time and relatively low by the end of the evening and during the night period immediately prior to the closing ceremony, during which each TV channel broadcasts its own programming.

Figure 3 shows the evolution of the tweets and rating per minute that took place during the broadcast of the Teletón 2012. The blue line corresponds to the evolution of the rating and the black line to the

Figure 3. Tweets and rating per minute



Note: Tweets per minute in black and Rating per minute in blue.
Source: Own ellaboration.

tweets per minute. At first glance there is not a very clear correlation between both indicators. In some periods both series move in the same direction. That happened, for example, at the beginning of transmissions, and during the morning and midday on Saturday, December 1, 2012. However, towards the end of transmissions, and in the hours immediately after, the series move in opposite directions.

As graphical inspection does not provide clarity about the possible association between tweets and rating per minute, it is necessary to resort to more accurate statistical analysis. To confirm whether or not there is a statistically significant association between the number of tweets per minute and the television rating, we consider a simple minimum least squares model in the following way:

$$Tweets/Min_j = a_0 + \Sigma_s (a_{1s} * Rating/Min_{j-s}) + a_i * X.j + u_j \quad (1)$$

Where *Xij* represents a matrix of control variables (*Programme*j, *Scheduleslj*,…) for every minute *j* in the sample and *u* is a vector with the random component of the estimate, respectively. Finally, to measure the possible causality from rating to tweets per minute, it is necessary to consider shortcomings of the rating of one or more minutes. This is because rating is measured by ended minute; on the other hand, tweets are captured second-by-second. For this reason, the sum *Σs* contains all values laggard of the variable Rating/Min incorporated in the model for the period *j-1* to *j-s* previous to the minute j in which tweets were produced.

Table 1 summarizes the results for the different estimated models. Model 0 analyzes the linear relationship without control variables between rating per minute and tweets per minute. As seen, the estimated coefficient is negative, as opposed to the null hypothesis. However, by incorporating the control variables for the different programs and schedules (models 1 to 4), the rating's coefficient is positive. In models 1 and 2 of those coefficients are also statistically significant. Models 3 and 4 incorporate the ratings of the two previous minutes (model 3) and the two and three minutes prior to the activity on Twitter (model 4). By doing so, the coefficient of the rating remains positive, but its effect is dissipated slightly, losing its statistical significance. I.e., data are consistent with the existence of a multiscreen audience that is being motivated to produce content related to what is being broadcasted simultaneously on television.

Table 1: Estimation of the rating effect on Twitter's activity

Variable	Model 0	Model 1	Model 2	Model 3	Model 4
Constant	322.75 ; (8.80){***}	348.18 ; (6.89){***}	362.57 ; (14.19){***}	362.85 ; (14.20){***}	363.16 ; (14.22){***}
Rating lag 1	-2.75 ; (0.19){***}	1.36 ; (0.21){***}	1.60 ; (0.24){***}	2.34 ; (1.70)	2.40 ; (1.70)
Dummy Comerciales		42.09 ; (12.12){***}			
Period – Night		-220.92 ; (10.77){***}	-175.19 ; (24.23){***}	-175.19 ; (24.23){***}	-175.49 ; (24.25){***}
Period – Prime		-298.77 ; (11.35){***}	-358.68 ; (9.81){***}	-358.68 ; (9.81){***}	-359.13 ; (9.84){***}
Period – Afternoon		-245.91 ; (8.30){***}	-39.56 ; (20.10){*}	-39.56 ; (20.10){*}	-39.45 ; (20.11){*}
Period – Early		-338.97 ; (8.68){***}	-69.19 ; (17.34){***}	-69.19 ; (17.34){***}	-69.10 ; (17.34){***}
Space-ending			67.37 ; (8.21){***}	67.46 ; (8.21){***}	67.56 ; (8.22){***}
Commercials 1			151.05 ; (21.21){***}	151.19 ; (21.22){***}	151.22 ; (21.22){***}
Commercials 2			132.59 ; (24.16){***}	132.40 ; (24.17){***}	132.20 ; (24.18){***}
Commercials 3			-228.65 ; (37.89){***}	-232.75 ; (39.01){***}	-237.36 ; (40.28){***}
Commercials 4			-327.48 ; (25.81){***}	-327.75 ; (25.82){***}	-328.09 ; (25.84){***}
Commercials 5			-284.16 ; (46.18){***}	-284.51 ; (46.19){***}	-284.73 ; (46.21){***}
Commercials 6			-213.04 ; (46.20){***}	-212.98 ; (46.21){***}	-213.14 ; (46.22){***}
Commercials 7			-245.73 ; (34.73){***}	-245.79 ; (34.73){***}	-245.96 ; (34.74){***}
Commercials 8			-262.34 ; (42.39){***}	-262.10 ; (42.40){***}	-262.22 ; (42.41){***}
Section – Breakfast			-280.58 ; (20.60){***}	-280.88 ; (20.61){***}	-281.25 ; (20.63){***}
Prime time section			-74.05 ; (24.66){**}	-74.34 ; (24.67){**}	-74.31 ; (24.68){**}
Section – Humor			41.33 ; (13.33){**}	41.39 ; (13.33){**}	41.45 ; (13.33){**}
Section – Mr. Teletón			-242.04 ; (22.56){***}	-242.31 ; (22.57){***}	-242.63 ; (22.59){***}
Section – news			-200.01 ; (24.00){***}	-200.23 ; (24.01){***}	-200.50 ; (24.02){***}
Section – Channel's newscasts			-65.91 ; (22.90){**}	-66.09 ; (22.91){**}	-66.01 ; (22.91){**}
Section – Mundo arriba (Up the world!)			-305.01 ; (20.14){***}	-305.24 ; (20.15){***}	-305.53 ; (20.16){***}
Section – All-nighter			-244.05 ; (12.91){***}	-244.31 ; (12.93){***}	-244.61 ; (12.95){***}
Section – Last Goal Wins			-185.69 ; (22.56){***}	-185.93 ; (22.57){***}	-186.20 ; (22.58){***}
Section – Vedetón (strippers show)			-32.11 ; (16.54){cdot}	-32.39 ; (16.56){cdot}	-32.68 ; (16.57){*}
Section – Closing ceremony			67.37 ; (8.21){***}	67.46 ; (8.21){***}	-67.56 ; (8.22){*}
rating lag 2				-0.75 ; (1.69)	-0.03 ; (2.30)
rating lag 3					-0.78 ; (1.69)
r2	0.11	0.55	0.74	0.74	0.74
Adj. R Square	0.11	0.55	0.73	0.73	0.73
Obs. Number	1710	1710	1710	1710	1710

***p<0.001, **p<0.01, *p<0.05

Source: Own ellaboration.

Results suggest that the effect of the level of rating on the activity on Twitter in relation to what is being broadcast on television is positive and statistically significant. On average, one additional rating point increases the flow of tweets per minute over a range of 1.15-1.65 additional tweets per minute. In addition, results show that the effect of rating is immediate, ranges from one minute to the next, but does not prolongs in successive minutes. These increases can, at first sight, seem modest. However, it should be considered that the level of activity on Twitter about Teletón 2012 is already high in relation to other issues seen in that social network. By way of comparison, from our experience in the study of the activity on Twitter in Chile, many issues that have become trending topics (topics highly discussed on Twitter) have done it with an accumulated volume of less than two thousand tweets within the period of a couple of hours. That means rates of tweets per minute which are less than half of which were observed on Twitter in relation to Teletón 2012. In support of the above, if we restrict the analysis only to prime time, the positive and significant effect of rating increases in a range between 5.35 and 6.55 tweets per minute (see table 2). These proportions are consistent with those found for the United States by Nielsen (2013).

Tabla 2. Estimación del efecto del *rating* sobre la actividad en Twitter en horario *prime*

Variable	Model 5
(Constant)	-303.23{***}
	-39.67
Rating lag1	5.95{***}
	-0.6
Section – Closing ceremony	118.65{***}
	-6.51
Channel's newscasts	100.3{***}
	-19.61
R2	0.51
Adj. R2 = Adj. RSquare	0.5
Obs. Number	357
***p<0.001, **p<0.01, *p<0.05	

Source: Own ellaboration.

CONCLUSIONS

New Internet media, simultaneously massive and custom, are changing the experience of paying attention to the television content. The existence of these alternatives is a challenge for television programs. On one hand, it is a potential threat, because it can decrease the attention of audiences. On the other hand, it can become a vehicle to identify more loyal audiences. The television industry understood these potential effects and incorporated to its programmatic offer content specifically directed towards audiences who interact via social media. All of this has been fundamentally based on intuition rather than statistical evidence on the relationship between television rating and activity on social networks.

The identification of this relationship is not easily observable. For this reason, statistical techniques are required to detect the degree of association between both phenomena. Following this line of research, this study presents quantitative evidence suggesting that television rating affects Twitter activity in Chile. Specifically, an increase of one rating point generates statistically significant increases of 1.5 tweets per minute on average and of 6 tweets per minute during prime time. It should be specified that analyzed data refer to tweets possible to capture through the Twitter Streaming API and which contain any of the terms considered in the search. Other messages related to the event Teletón that did not use any of the concepts stated here are not considered in the estimate, and therefore the estimated impacts of this study should be understood as a start point of the real effect of rating on Twitter activity.

A simple minimum least squares model with lagging variables has been proposed. Future research should open the estimation to more sophisticated and flexible techniques, such as non-parametric estimates that allow capturing variations through the time of impact of rating on the activity on Twitter, and correct for the potential bias introduced by the identification strategy of the rating's effect on Twitter activity used in this work. On the other hand, regardless of the econometric estimation technique used, other extensions in the analysis of the data are possible and desirable. In particular, future research should incorporate the features of the Twitter accounts activated in different times or programs, as well as the interaction that occurs between Twitter accounts around specific programs. Finally, for a better understanding

of the processes of audiences segmentation identifiable in the social network it is necessary to develop strategies for monitoring that are a step beyond the measurement of volumes of messages, to understand the diverse communities that emerge around various programs and schedules.

FOOTNOTES

1. We want to thank Arturo Arriagada for his comments to a previous version of this document and two anonymous reviewers for their comments and suggestions.

2. For a review of the origin of the concept, see Merton (1968).

3. http://www.peoplemeter.cl/timeibope/rating.asp

4. http://es.wikipedia.org/wiki/Telet%C3%B3n_2012_(Chile)

5. Agradecemos a Cristóbal Florenzano por darnos acceso a los datos de rating utilizados en este estudio

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