Analysis of patterns of use, production, and activity in kid YouTuber channels. A longitudinal study through three cultural contexts: United States, United Kingdom, and Spain

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Abstract

This paper analyzes the data collected about 5,388 videos from the 15 leading channels from Spain, the United Kingdom, and the United States focusing on toys and in which the protagonists are children under 14 years of age (2011-2019). It aims to determine whether there are common patterns of use, production, and activity in videos by kid YouTubers. Specific software was developed to enable information to be gathered from the YouTube platform through the YouTube Data API by analyzing the date the video was published, length, number of visits, likes, dislikes, and visits/vote (visits/[likes+dislikes]). The main conclusions drawn are that a channel's success is not dependent on a pattern or specific characteristics, although an impulse pattern has been detected; participation by children who consume content in the United States differs significantly from participation by those in Europe; and certain similarities based on video length and production frequency can be observed between channels.

Keywords: kid YouTuber channels, children's video channels, toys, young YouTubers, audiences, followers, brands and YouTuber content creators, culture

1 Introduction

YouTube is a platform that is extremely popular among children. Since 2016, content consumption by children has increased relative to age. In 2018 in the United Kingdom, children aged between 8 and 11 preferred this platform (49%) to traditional television (14%), compared to 40% and 18%, respectively, in 2017. A similar trend has occurred in the 12-15 age range (Ofcom, 2019). The same study indicates that viewing of vloggers increases with age (25% for children aged 5 to 7, 40% for children aged 8 to 11, and 52% for adolescents aged 12 to 15). In addition, in the USA and in the UK, children are becoming attracted by influencers at an increasingly early age (25% among children aged 6 to 9, 26% among pre-teen children aged 10 to 12, and 24% for teenagers aged 13 to 16), according to the Wunderman Thompson study on "Generation ALPHA" (2019).

In the United States, United Kingdom and Spain, the average number of minutes that children from 4 to 15 years old spent on YouTube increased between 25 and 40 minutes in 2020 compared to the previous year. In 2020, the figure for Spain rose to more than one hour and a quarter per day watching content posted on the YouTube platform, compared to half an hour in 2019, while in the case of children from the UK and the US, the figure was even greater (Orús, 2020).

This paper aims to detect patterns of creation and consumption in the most viewed children's video channels in the three countries where the highest-ranking channels are concentrated (United Kingdom, United States, and Spain). This makes it possible to discover certain aspects regarding both children's behavior with regard to YouTubers and the behavior of YouTubers with regard to their own creations or products (the videos). It thus provides the opportunity to anticipate behavior and to gain a greater understanding of use and production in

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different cultural contexts, so as to detect similarities and differences. This would provide insight into the personal and individual characteristics arising from the channels' origin, analyzed in the context thereof. According to Renobell Santaren (2020), Spain is a country containing larger households and more consensual family relationships. Hofstede (1984) defines it as a collectivist society because its citizens form part of 'in groups' in order to gain security and protection in exchange for loyalty, with Spanish society having a greater attachment to the concept of community (Lighici, 2015). By contrast, the societies of the United Kingdom and United States are characterized as being individualist societies in which relations between citizens are looser and each person looks after themselves and their family (Hofstede, 1984, 2020; Hofstede and Hofstede, 2004). The three countries selected in this study represent benchmarks for kid YouTuber channels: the United States, as a pioneer of this phenomenon (with EvanTubeHD in 2011) and the location of current hit channels like the Vlad and Niki YouTube (ranked sixth among all YouTubers globally); Spain, due to the considerable number of Spanish kid YouTubers in the top positions, specifically those ranked 68 to 3,403 over the period in which the study was conducted; and the United Kingdom, as a benchmark in the English-speaking EU.

Lange (2014) posited that children begin to create content on YouTube merely to entertain themselves but that gradually, over time (and with the complicity of their parents), they and their families become more professional content creators, thus transforming the channel into a professional medium based on the revenue from explicit or surreptitious advertising (Martínez-Pastor, Ongkrutraksa, and Vizcaíno-Laorga, 2020). Feijoo and Pávez (2019) hold that the presence of this type of advertising provides the livelihood of YouTube channels aimed at children, in which significant engagement (Westenberg, 2016) and enormous Electronic Word of Mouth (eWOM) is generated among their peers (Global Web Index, 2014; Lange, 2014). Research has made clear that children become influencers through imitation (Brown and Hayes, 2008), and thus brands seek to be present on this type of channel (Goldate, 1997; Hartmann, 2004; Marsh, 2015). Fears about infringement of advertising rights have already been thoroughly addressed (Feijoo and Pávez, 2019; Kerkhof, 2020; Martínez Pastor, 2019; Martínez-Pastor, Serrano Maíllo, Vizcaíno-Laorga, and Nicolás Ojeda, 2017; Reid, 2014; Wu, 2016) although not sufficiently resolved (ASA, 2017; ASA, 2018; FTC, 2015; FTC, 2019; IAB, 2018).

There have been no longitudinal studies in the literature which analyze both kid YouTubers as producers and consumption of these products by their peers (other children) in relation to cultural differences (much less with the magnitude of the data dealt with here), and so this study has opened a line of analysis which is thus far unexplored. Some of the research studies focusing on children concentrate solely on the products (often geared towards the presence of advertising) but not on consumption (Evans, Hoy, and Childers, 2018; Tahir et al., 2019; Tur-Viñez, Núñez-Gómez, and González-Río, 2018). Others focus on consumption but not on the product (Burroughs, 2017; Duncum, 2014), and others center on young people and teenagers but not on small children (García-Jiménez, Catalina-García, and López-de-Ayala, 2016). However, current research has not determined which elements have the potential to attract the public and whether said potentially attractive elements and behavior regarding the products (videos) are common or whether they differ depending on the different cultural contexts. To this end, an analysis was undertaken of data from between 2011 and 2019 of 5,388 videos by the kid YouTubers (children under 14 years old, taking by way of reference the indications of Regulation (EU) 2016/679 of the European Parliament and of the Council on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, in accordance with the current regulations of the member states of the European Union and according to the age requirements for Google accounts) from three

culturally distinct countries – the United States, the United Kingdom and Spain – with the highest rated channels in the Social Blade ranking.

This research study is interested in ascertaining whether there is any type of pattern which determines the success of a kid YouTuber's channel. This interest was motivated by the increased number of views of certain children's channels over the last nine years in a number of countries with a greater consumption of such channels, such as – in our case – the United States, the United Kingdom, and Spain. Finding out whether a successful pattern exists can provide the key elements for understanding their consumption among children and contribute a further line of research into this phenomenon.

2 Theoretical framework

The objective of this study is to conduct an analysis of the patterns and characteristics over time of channels of children who are creators of YouTube content to describe some of the features of the most-viewed channels aimed at children and in which the protagonists are children.

Children as audience in the context of YouTube as a commercial product

The need to analyze the audience's behavior is determined by the fact that YouTube channels are, from the perspective of the content creator, a commercial medium, although they may have originated as spontaneous expression and entertainment for the children. Therefore, the study falls within research into the culture industry as a commercialized-capitalist concept, far from the original term of culture industry coined by Horkheimer and Adorno (Cool, 1996; Horkheimer and Adorno, 2007[1944]; Silva Rodríguez, 2013; Szpilbarg and Saferstein, 2014). However, from the perspective of recipients, the research falls within the realm of the prosumer (producer/consumer) in its original concept of commercialization of communication, in which we all produce information, data, or products the communicative system itself exploits, gearing them towards consumption (Toffler, 1997[1979]). From this perspective, the consumer (the children who watch the channels of their preferred YouTubers) is an alienated person, who can be manipulated and exploited by the media: Products and consumer become part of a system (in this case, created by YouTube) which attempts to obtain data about the consumer so as to perpetuate advertising through the influencer's success. Toffler's point of view (prosumer) is at odds with the approach from Cloutier (EMIREC), in which the child is an autonomous individual who is critical of the media and able to use them for his or her own benefit.

Previous studies: YouTube channels as a product

Work on creative patterns. Some studies have been interested in discovering patterns of creation among YouTubers in order to identify the elements that content creators are developing in their channels to enhance their draw for consumers. Establés, Guerrero-Pico, and Contreras-Espinosa (2019) analyzed the channels of young YouTubers, concentrating on the skills they possess to create the channels. In their research, García-Rapp (2016) and Marwick (2013) start out from the idea that young influencers construct stories that are as real and as close as possible to their audiences in order to retain them, get more followers, and draw the attention of brands. They conducted interviews and questionnaires with young people, and the most significant results were that most young creators begin on social media by way of entertainment or to position their personal brand, and little by little their parents come to understand that the channel can have great financial potential, without them entirely comprehending the social and economic context of the kidfluencer YouTuber market and the professionals who participate in it. This indicates that young people start out to project their social image but initially lack media

skills. In the case of adolescents, as opposed to children, in addition to creating their channels as part of their entertainment and as a projection of their personal brand, they progressively grasp that it represents one more part of their social image. They generate a lifestyle which is associated with their persona even though they very often lack any great media or technological skills beyond communication with their peers. Johansen (2018) focused on analyzing the fundamental role of the media in children's development through playful, cultural, and aesthetic content, whereby children who are constantly using digital media are becoming active citizens in an increasingly digitalized society.

Explanatory studies focusing on audience. Another recent approach that has centered on detecting the reasons for a channel's success has been that of case studies. Illera and Benito (2018) focused their research on the case of Verdeliss, a Spanish YouTuber who is a mother of six. By studying the content of 606 videos from 2017, the authors determined that the increased popularity and follower numbers of the channel has led to an increasing presence of brands. The brands appearing in the first few years were featured spontaneously and had not paid to appear, whereas in the last few years brands have reached some kind of financial agreement with the channel or have given gifts with clearly promotional intentions. This channel's success is due to the reality television system, whereby YouTuber content creators generate their stories for the audience that follows the channel, and to the brands whose interest is aroused by both the content and the follower numbers, by reaching a specific audience, but not by the professional skills or special techniques of its protagonist, Verdeliss.

In this vein, Morreale (2014) described how YouTubers naturally evolve through their success (they switch from amateurs to professionals) with their own channels and brands. For her study, she focused on the YouTube web series entitled Annoying Orange, which started off with 'homemade' videos published on YouTube. Among her key conclusions, Morreale considered that YouTube has the same structures as conventional media because it is a commercial medium with clearly financial interests which go beyond the online environment. In fact, this has been understood by many YouTubers who were already professionals from other environments and were familiar with the market while, at the same time, the YouTube platform offered tools to manage their channels and enhance their videos, with the market being very similar to the traditional market insofar as it is a business environment. Laeeq Khan (2016) observed, from a study of 1,143 users, that one of the strongest motivations for the success of the channel was the profile itself (entertainment, as compared to other types). The author distinguishes between different levels of consumption (viewing and liking/disliking compared to commenting and sharing).

This study analyzes the content of the videos of the five kid YouTuber channels with the highest numbers of followers and video views in each of three countries (Spain, the United Kingdom, and the United States, for a total of 15 channels) in order to identify correlations between the core topics of the videos and the increase in the digital participation data. Little is known about the topics the most popular influencers on YouTube share with their pre-teen and teenage publics. In response, this exploratory study has used content analysis to examine this gap and compare the topics reflected in their videos with others. To this end, a content analysis was performed through an interpretation based on an analysis sheet validated by experts. It was observed from the analysis that most of the children who are the channels' protagonists are currently aged between 10 and 12, the channels having been created an average of five years before, which demonstrates how early many YouTubers are starting out in this industry. There are also differences in the core topics of the videos posted on the channels depending on the gender of each kidfluencer. There are more male YouTubers devoted to toys, while their female counterparts are more present in videos belonging to the lifestyle category. It seems it is necessary to supervise the content children access on this platform as it can deepen not only

gender differences but also become a flawed standard of models of behavior (Castillo-Abdul, Romero-Rodríguez, and Larrea-Ayala, 2020).

Descriptive studies about professionalization and commercialization. The work by Jorge, Marôpo, and Nunes (2018) focused on the presence of brands in the channel starring Portuguese YouTuber SofiaBBeauty, who has been creating content since the age of 12. Their analysis addressed the professionalization of young people's channels and the migration of advertising to this platform, thereby creating a new model of celebrity, that of the 'influencer', which follows the same commercial guidelines as other media. The characteristic which defines an influencer is having a large number of followers, and this depends on the credibility of the YouTuber and on the degree of personal information they are prepared to show and talk about in their channels to attract their followers' attention. This means that intimacy and influence become a source of creating a business in which brands have a platform where they can showcase their products, provide discounts, and collaborate with other brands. The methodology they followed involved taking a sample of 12 videos (one per month) from 2017 from the SofiaBBeauty channel. The study gathered both the topics of the videos and the information generated by each video based on likes, views, and so on. Among their key conclusions, they highlighted that when Sofia began, she had no commercial alliances, and later she became a construct of the brands that colonize youth culture (Berryman and Kavka, 2017). Sofia gives the appearance of autonomy and freedom with no ties to any brands, for which her followers applaud her, but whenever she recommends a product, her fans demand to know the brand and product she is suggesting. Due to this, the authors recommended that young people gain appropriate levels of media literacy; young creators believe that they are unaffected by commodification because they showcase and give their opinions about whatever they want, but they are part of the market, just like any other product. They represent just another product, and commodification of young people is being created through YouTuber channels.

Other authors have directed their attention to studying specific formats on kids' channels, such as unboxing (Nicoll and Nansen, 2017), centering on the variables of actors, ages, and gender of the children, narration, product, and brand. The research by Marsh (2015) dealt with understanding the reasons why children feel attracted by content from other children and, particularly, by the unboxing format.

Hou (2018) worked on the contextual factors which have a bearing on the success of influencers on YouTube beauty-based channels, such as the platform's technical resources, the revenue model, the beauty market, and fashion consumers, among others. She took as a starting point the idea that influencers are characterized by the inherent popularity of the digital medium and consumption-oriented discourse, along the lines of Lobato (2016). In fact, Hou (2018), in accordance with Kim (2012), holds that YouTube has become institutionalized as a platform for professionals who share content – even though started by amateurs – and whose purpose is commercial.

The research by Abidin (2017) centered on the commerce fostered by family microcelebrities based on the content that focuses on the daily routines of domestic life, by sharing them with followers. The author talks about "calibrated amateurism" in which families – both parents and children – generate videos which elaborate and recreate an invented 'authentic life', which portrays the aesthetic of an amateur, and followers actively participate by praising and envying their lives. She analyzed two channels, The Reality Changers and the Eh Bee Family, and examined their content and the comments posted by their followers through several platforms between January 2012 and July 2016. The methodology used was physical and digital observation of participants, personal interviews and group interviews, live archives through screengrabs, and web archaeology of social media web content and sites. She reached the conclusion that content creators start out being passionate, independent, and unremunerated

but that growth, saturation, and competition forces them into a professionalization of the industry, creating roles that they play in the channels.

Holland (2016) investigated the growth and evolution of three YouTuber channels through questions based on the studies by Lavaveshkul (2012) and Biel and Gatica-Pérez (2011), using the Social Blade tool. Through a systematic, objective, and quantitative analysis, the study examined the characteristics of the messages in the channels, such as the three channels' homepage designs featuring the channel's logo, self-promotion, and the presence of any brands not belonging to the channel, aside from the opinions of those viewing these channels. It also investigated frequency, the time of day (schedule) when new videos appeared, and average video length. The conclusion drawn was that when a channel is successful, the commercial strategies of the influencer's brand take advantage of both the online and the traditional worlds: when launching products, for example, by promoting a new book on television. Digital media encourages the leap by successful influencers over to conventional media with a joint, integrated strategy.

Studies on YouTube consumption and cultural influences. Although there are few studies into this aspect, there does appear to be a consensus that there is a cultural component to consumption of products (on YouTube as well) which influences it in some way. Park, Park, Min Baek, and Nacy (2017) investigated whether consumption of YouTube videos by other cultures is related to the culture of the audience and concluded, after analyzing 58 countries, that "consumption of popular videos in culturally different countries appears to be constrained by cultural values". Similar results were obtained by Min Baek (2015) in a case study on Korean popular music videos and the foreign audience that consumes them. Although the variables used (YouTube records, Hofstede's national culture scores, and national indicators for the GDP per capita, and internet diffusion status from the World Bank) are very heterogeneous, the author demonstrated that cultural distance does have an impact on consumption.

As can be observed, the methodologies employed in the different studies are varied. However, a need to use certain automated resources to extract data for this type of research, in addition to manual analysis, has also been demonstrated. Research such as that carried out by Araújo et al. (2017) made use of an Application Program Interface (API) to quantitatively analyze visits, comments, users, length, and topics of different kid YouTuber channels (which are all the indicators provided by the YouTube API) in a way that is similar to how the study presented in this paper was conducted.

3 Objectives

This paper seeks to find out the patterns of use, consumption, and production which are common to the most successful YouTube channels protagonized by pre-adolescent children in Spain, the United Kingdom, and the United States.

Secondary objectives:
- Describe the characteristics of successful YouTube channels, characteristics defined by their prevalence over time, length, frequency, number of visits received, likes, dislikes and visits/votes (visits/[likes+dislikes]). Based on visits/votes, 'interaction' has been defined for this study as the inverse of visits/[likes+dislikes], which indicates how many visits are necessary to obtain a like or dislike. Little interaction implies that many visits are necessary to generate a vote (whether positive or negative).
- Detect differences between different cultures (Spain, the United States, and the United Kingdom) with regard to the aforementioned features.
- Detect the consistency or evolution of said features over time.

- Ascertain the possible differences between the channels with short- and long-length videos as well as different publishing frequencies of videos published per week (average publishing frequency and high publishing frequency).

4 Methodology

An analysis was performed of a total of 5,388 videos published between 2011 (the year of the launch of the first channel starring a child and aimed at children, EvanTubeHD) and 2019 from the five highest-ranking kid YouTuber channels from each of the United Kingdom, United States, and Spain, amounting to a total of 15 channels; these countries are those appearing in the top slots of the Social Blade ranking for channels starring children aged under 14 and whose main topic is toys (Table 1). The channels selected were chosen following preliminary filtering of thousands of channels, as Social Blade does not itself offer direct filters to obtain a sample such as the one used in this study. As regards the countries chosen, in addition to being three countries with sufficiently different cultures to enable the results obtained to be evaluated based on that cultural consideration, other methodological considerations were taken into account such as certain peculiarities detected for those countries (such as the number of channels ranked in good positions and differences with regard to the product-video itself). The variable of the topic of 'toys' was used to standardize the comparison criteria and control the influence the topic may have as an outlier, thus attempting to overcome the limitations noted by Araújo et al. in their work (Araújo et al., 2017), limitations which refer to the fact that the owner of a channel could tag the video with two or more categories and this could create confusion when selecting and analyzing. However, this research study is based on channels (not videos) whose content has been observed and verified as being devoted, fundamentally, to toys.

The exact process for selecting the sample through Social Blade made it necessary to manually review a large number of channels based on the most-viewed channels. This is because it is not possible to select the "top 15 channels about toys featuring children under 14 years old". Therefore, a review was undertaken, channel by channel, of the most-viewed YouTubers around the world in any category. As a result of this process, it was observed that the leading channels devoted to toys and featuring children aged under 14 were in the United Kingdom, the United States, and Spain.

The study differentiated between YouTuber channels with a video frequency of three or more videos published a week and an average weekly duration of over 30 minutes (Group 1) and YouTuber channels with a video frequency rate of less than three a week and an average weekly duration of under 30 minutes (Group 2).

In addition, the selected channels were identified without filtering either category or country; that is, these channels were found through their absolute position (that is, the position in the world ranking: among all the channels of all the countries in any category) in the ranking of all channels, on any topic, and from anywhere in the world. Therefore, if a channel was placed in 30th (Ryan ToysReview, USA) or in 68th position (Las Ratitas, Spain), it means that it was ranked in 30th or 68th position (respectively) out of all the channels in the world. The data contained in Table 1 must be interpreted in this context.

Table 1: Sample of selected channels[1].

YouTube channel	Group (according to weekly average duration) Group 1 >30 minutes Group 2 <30 minutes	Country	Ranking[2]
1. Los juguetes de Arantxa	1	Spain	3,403
2. Mikel Tube	1	Spain	390
3. The Crazy Haacks	1	Spain	3,034
4. Emily Tube	1	UK	408
5. Hitzh Toys	1	UK	6,919
6. Toys And Me	1	UK	2,215
7. Hulyan Maya	1	USA	18,364
8. Naiah And Elli Toys Show	1	USA	5,009
9. Ryan ToysReview	1	USA	30
10. Jugando con Aby	2	Spain	2,718
11. Las Ratitas	2	Spain	68
12. Lucky Surprise Toys Review	2	UK	1,637
13. Toys and Little Gaby	2	UK	129
14. EvanTubeHD	2	USA	3,757
15. Hailey's Magical Playhouse	2	USA	8,942

Source: Authors' compilation.

To obtain these data, specific software was developed to enable data to be collected from the YouTube platform through its API, YouTube Data API v3. The data analyzed were:

- video publication date;
- length;
- number of visits;
- number of likes;
- number of dislikes;
- V/V or Visits/Votes (= visits/[likes+dislikes]).

The data were stored in a database (a .sav file) and later processed using the IBM SPSS 18 statistical software.

The analysis was conducted channel by channel, and later an estimation was performed by group and country using Box-Jenkins methodology for the estimation models in order to identify seasonal patterns and the differences and similarities between them.

To analyze the channels over time, an ARIMA model was selected, detecting the additive outliers and level changes automatically. The best models were selected following the criteria of Akaike (1974, 1980) and Schwarz (1978). For example, in the case of the Las Ratitas channel, the resulting estimated model for each characteristic being studied is:

$$\acute{Y}_{t, duration} = \acute{Y}_{t-1, duration} + 0.190(Y_{t, duration} - \acute{Y}_{t-1, duration}) + \square_t$$
$$Y_{t, visits} = -(Y_{t, visits} + Y_{t-1, visits}) + 0.845\square_{t-1, visits} + \square_{t, visits}$$
$$Y_{t, likes} = 26051.32 + \square_{t, likes}$$
$$Y_{t, dislikes} = -(Y_{t, dislikes} + Y_{t-1, dislikes}) + 0.771\square_{t-1, dislikes} + \square_{t, dislikes}$$

[1] Social Blade (2019) has a classification system to measure the influence of a channel based on a number of metrics, including average view counts and the amount of other channels' widgets listed in. The channels classified by this database as A+, A, or A- SB, followed by B, are the most influential channels. (https://socialblade.com/youtube/help/what-is-sbrank-all-about).

$$Y_{t, \text{likes/dislikes}} = 3.29 - 0.302\,\square_{t-2, \text{likes/dislikes}} + \square_{t, \text{likes/dislikes}}$$
$$Y_{t, \text{v/v}} = -\left(Y_{t, \text{v/v}} + Y_{t-1, \text{v/v}}\right) + 0.823\,\square_{t-1, \text{v/v}} + \square_{t, \text{v/v}}$$

From this point on, it was possible to compare the estimated model and the observed model and draw the corresponding conclusions.

5 Results and discussion

Out of a total of 5,388 videos from between 2011 and 2019 (Spain, United Kingdom, and United States), an analysis was conducted of use, consumption, and interactions in the most successful YouTuber channels (five channels from each of the three countries, a total of 15 channels) featuring children under 14 years old whose main theme is that of toys, in order to determine if there are coincidences or differences between countries or between quantitative features of the channels (length of video, frequency of publication of videos per week).

Results by country

Table 2 shows the main statistics of the aggregated data by country, in which video length, visits, likes, dislikes, and visits/votes of the channels have been measured.

Table 2: Main statistics by country.

Country	Characteristic	Statistic			
		Average	Est. dev.	Min	Max
Spain	Length	14.75	3.10	7.15	19
	Visits	5261336.02	7399453.56	106396.24	29606934.09
	Likes	29242.96	40472.23	168.84	152896.88
	Dislikes	8384.48	16045.20	76.24	64135.12
	Visits/votes	153.64	82.64	72.03	405.68
United Kingdom	Length	12.09	3.84	4.22	19.23
	Visits	5650541.04	5293897.49	19800.65	17017424.90
	Likes	22661.63	18527.57	58.43	57591.74
	Dislikes	6384.24	8386.61	26.28	29323.58
	Visits/votes	257.71	230.93	42.18	840.26
United States	Length	11.14	3.79	4.34	18.93
	Visits	4003158.94	2875014.85	49606.25	9424168.61
	Likes	12610.54	10470.26	160.08	36772.27
	Dislikes	1883.04	1397.58	60.75	5270.35
	Visits/votes	272.63	144.05	73.09	546.92

Source: Authors' compilation.

Video length: Spain, the longest videos. The videos from the Spanish channels are significantly longer (p-value=0.007) than those from the United Kingdom and the United States. While in Spain video length is approximately 15 minutes, in the United Kingdom and the United States average video length is 12 and 11 minutes, respectively. The length of the videos is also more stable in Spain (variance=0.21) compared to the United Kingdom and the United States, which have a coefficient of 0.31 and 0.34, respectively, and therefore demonstrate greater variability.

       Visits per video: United States lagging behind. Statistically, there are no significant differences between countries given the great fluctuation of the values. However, if we look at

the average values of visits per video, this is greater in the United Kingdom (an average of 5.6 million visits per video) than in Spain (5.2 million) and the United States (4 million).

Likes-Dislikes: Spain, the most participative; the United States, the least active. Spain is the country having, on average, the most likes per video (29,242). However, the weight represented by dislikes compared to likes is identical in Spain and in the United Kingdom (28% dislikes/likes), while the percentage is noticeably lower for the United States (14.9%). Likewise, Spain has a higher like/visit ratio (0.0055) than the United Kingdom and the United States, which obtained like-per-visit ratios of 0.0040 and 0.0031, respectively. In other words, a Spanish video needs almost 1,800 visits to get one like, whereas a US video will need more than 3,000 visits. US channels have less interaction between children than the British and the Spanish channels. In addition, the children who interact in the US channels are more passive and when they do participate, they are less likely to do so negatively.

This may be due to cultural differences, as indicated by Hofstede (1984, 2020; Hofstede and Hofstede, 2004) and Lighici (2015), and it may be that as Spain is characterized as being a collectivist society whose citizens are more attached to the concept of community, participation and interaction by the children is greater than that of the other two countries in which relationships are looser.

Results by groups (according to weekly duration)

The study was designed based on two groups of channels: Group 1, with high weekly average durations (of over 30 minutes) and Group 2, with moderate weekly average durations (of under 30 minutes). The most significant results from comparing the two groups are given below, with the statistics summarized in Table 3.

Table 3: The most important statistics regarding the characteristics in a time-based study of YouTuber channels by group.

	Group 1 (30 minutes or more/week)					Group 2 (under 30 minutes/week)				
	Length	Visits	Likes	Dislikes	Visits/votes	Length	Visits	Likes	Dislikes	Visits/votes
Average	13.28	4734843.23	19727.71	4837.19	258.8	11.72	5326931.83	24171.04	6620.67	181.77
Standard dev.	4.04	4698766.06	16461.97	7011.76	195.08	3.41	6533126.1	37743.06	14658.37	111.87
Var. coef.	0.30	0.99	0.83	1.44	0.75	0.29	1.22	1.56	2.21	0.61
Min	4.34	106396.24	58.43	26.28	49.09	4.22	19800.65	139.3	60.75	42.18
Max	19.23	1701724.9	57591.74	29323.58	840.26	17.05	2960693.41	152896.88	64135.12	423.81

Source: Authors' compilation.

With regard to the frequency of uploading by Group 1 during this period, the percentage of weeks in which at least one video was uploaded had a variation range of [28%; 92%] in 2015, [40%; 100%] in 2016, [50%; 100%] in 2017, [88%; 100%] in 2018, and [88%; 100%] in 2019. The average number of videos uploaded per week had a variation range of [0.65; 3.38] in 2015, [1.29; 6.46] in 2016, [1.23; 5.58] in 2017, [2.28; 5.56] in 2018, and [1.43; 5.05] in 2019.

With regard to the frequency of uploading by Group 2 during this period, the percentage of weeks in which at least one video was uploaded had a variation range of [48%; 82%] in 2015, [62%; 92%] in 2016, [32%; 98%] in 2017, [65%; 90%] in 2018, and [3%; 95%] in 2019. The average number of videos uploaded per week had a variation range of [1.48; 2.06] in 2015, [1.61; 2.90] in 2016, [1.23; 2.54] in 2017, [1.32; 2.15] in 2018, and [1.0; 1.43] in 2019.

There is considerable disparity in the frequency of the videos uploaded, depending on each channel.

Less time, lower frequency, and greater success. Upon comparing the aggregate results obtained between two channel groups (those showing a weekly average duration of 30 minutes or more per week [Group 1] compared to those with a weekly average duration of under 30 minutes [Group 2]), it can be observed that the group with shorter video lengths is the group obtaining the most average visits. The likes in Group 2 are more profitable (0.0045 likes per visit) than in Group 1 (0.0041). However, there is a fall of 8.88% for Group 1 occurring with noticeably longer video lengths. The weekly average duration for the videos uploaded in Group 1 was approximately 40 minutes compared to 20 minutes for Group 2. Therefore, time does seem to have an influence but not in a lineal manner. Both groups have another characteristic feature: In all the channels of Group 1, the average frequency of videos uploaded per week was three or more, whereas for Group 2, it was fewer than three videos per week. Therefore, investing more time in the product (video) and publishing more frequently yields worse results than publishing 50% less average weekly minutes of video and more moderate publication frequencies. In fact, many of these children record the videos in the studios of the creator agencies following a script and without being able to make their own content. Meanwhile, content creators who generate videos in a more anarchic manner retain their naturalness as they are not forced to create content on a weekly basis.

Greater frequency, longer relative time. The Group 1 channels show an average presence on YouTube of 39.57 minutes per week and an average of three more videos published per week, whereas for Group 2 the time is half that amount (19.68 minutes) and average weekly publication rates amount to under three videos. This presence does not occur in a regular manner. In Group 1 channels, there are some weeks (12%) when no videos are published; in Group 2 channels, this happens in 26% of cases (lack of videos).

There is a greater average value and greater variability in Group 1 compared to Group 2 (Figure 1), and within the distribution of the data in Group 1 there are few outliers, which are outside the box plot, compared to Group 2 which is slighter larger.
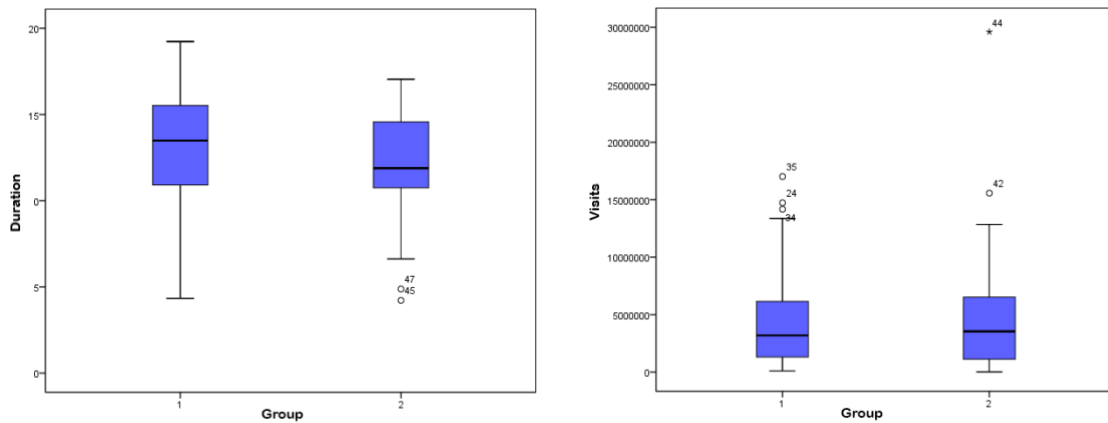
Figure 1: Box plot of the characteristics in a time-based study of YouTuber channels by group.

Source: Authors' compilation.

Group 1. For the Mikel Tube channel (Spain), for example, in week 25 of 2018 one video obtained more than 98 million visits. All the channels exceeded, on numerous occasions, 10 million visits (in some cases even exceeding 50 million visits), 50,000 likes (in some cases, even exceeding 100,000 likes), and 50,000 dislikes.

       Group 2. The Las Ratitas channel (Spain) offers anomalous data compared to the rest of the YouTuber channels analyzed because despite being a channel in Group 2 and with a low frequency as regards number of videos uploaded weekly, the videos have a very high impact on YouTube, with an exceedingly high number of visits, likes, and dislikes. The high values must also be noted as regards visit numbers for the Mikel Tube channel and Toys Little Gaby (UK) channel in 2019 and the Emily Tube (UK) channel, which in 2018 received multiple views through YouTube, although these videos are not videos with a high impact as regards visits and likes.
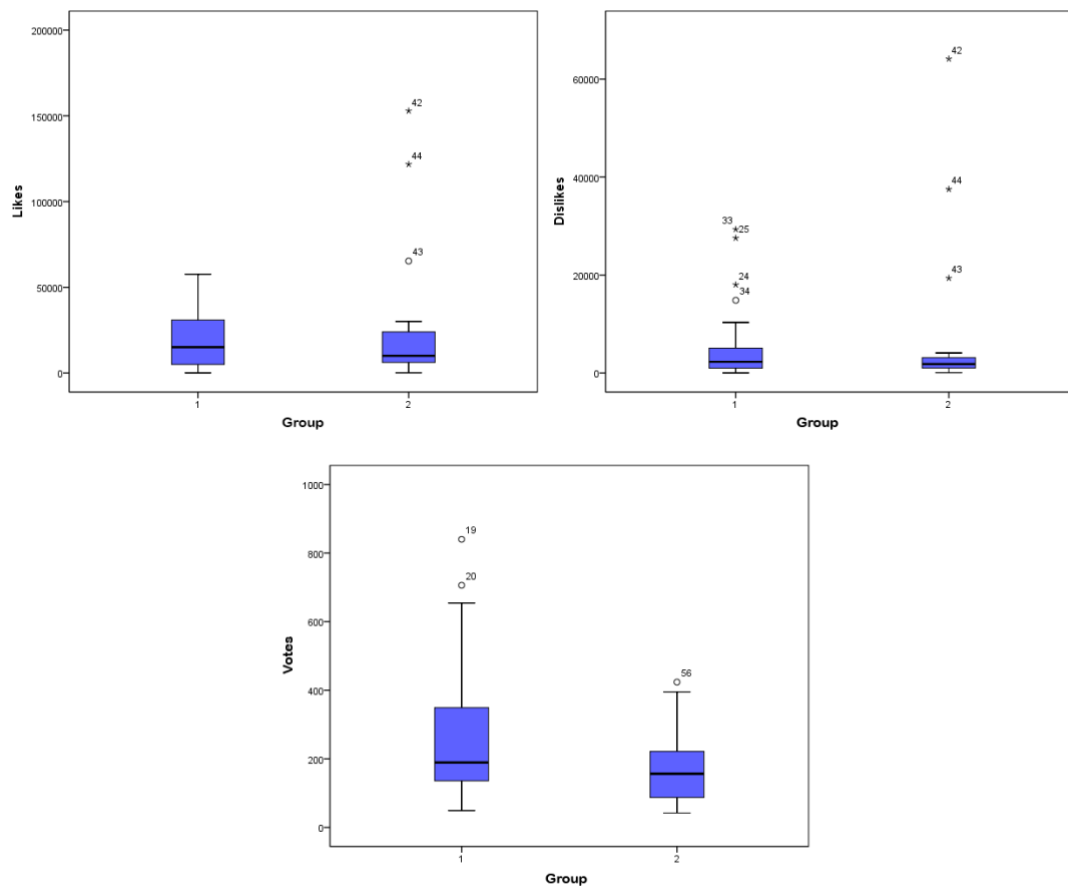
Figure 2: Box plot of the characteristics in a time-based study of YouTuber channels by group.

In general, the number of videos published per week by the YouTuber channels analyzed was constant. In some cases, in channels with a longer-lasting online presence (more than four years) an upward trend was observed (Los juguetes de Arantxa, Spain; Ryan ToysReview, USA).

The high number of dislikes for the Toys and Little Gaby channel during 2017 and 2018 and for the videos of the Ryan ToysReview channel in 2016 and 2017 is significant. Hitzh Toys (UK) was the only channel which achieved an anomalous high number of visits/votes (that is, low interaction based on number of visits) in 2015 and 2016 with regard to the channels analyzed, after which period it begins to show an upward trend as regards interactions.

In accordance with García-Rapp (2016), Marwick (2013), and Johansen (2018), the channels where videos are uploaded more frequently become professional content creators in a natural way (Morreale, 2014). They build stories that are as real and close to their audiences as possible in order to retain them, gain more followers, and draw the attention of brands as well as creating more sophisticated narratives over time either thought up by them themselves or promoted by brands.

Basic results of the weekly frequency of videos published

From the statistical analysis of the data, it was observed that the time-based characteristics of

13

the YouTuber channels of both groups were series with multiple outliers.

After applying the best models based on the criteria of Akaike (1974, 1980) and Schwarz (1978), it was observed that there is a lack of a clear pattern that makes it possible to explain the reason for the success of these videos. Akaike (1974) proposes a criterion for selecting a model from among the finite group of models to prevent overfitting parameters. This involves studying the problem of identifying the best model from the perspective of statistic decision theory, which transfers the problem of the goodness-of-fit of a model to the choice of the most appropriate loss function. The solution given by Akaike (1973) is to choose as the loss function (or specification criterion) the minimum of the AIC information criterion, symbolized by MAICE (minimum AIC estimation). This criterion, defined by Akaike (1974) as "an information criterion" is based on the Kullback-Leibler (1951) information measurement, which makes it possible to interpret the distance between two distributions (in our case, that observed from the sample and the theory) based on the log-likelihood of a model. Related to this model is the Schwarz information criterion (SBC) by Schwarz (1978) which generalizes the Bayesian information criterion (BIC). Both models introduce a penalty term for the number of parameters in the model, which is larger in the BIC than in the AIC.

Most of the time series are explained by the two previous data. That is, whether the previous videos were liked or not, the reception of the videos immediately following them is similar to how the previous video was received, but there is not a pattern over time. The children who consume this content only remember what they have seen the previous week and then forget it. This implies that the inertia with regard to quality of the videos uploaded by the YouTubers analyzed was explained by the type of videos published in the two previous weeks.

Although we could suppose that the children become progressively more professionalized, the success of the videos continues to be erratic, and even when they have very successful videos they are not able to reproduce the same impact in the following videos. This result does not coincide with the research performed by García-Rapp (2016), Marwick (2013), and Establés et al. (2019), which holds that professionalization can be a factor in their success. Thus, characteristics of professionalization would be constant periodicities, constant video lengths, programmed topics, repetitive scenarios, technical aspects (such as appropriate lighting, script, editing), among other things. Of these, neither periodization nor video length seem to be linked to success. There are other factors (as yet unidentified) which could be influencing that success which, in any case, arises in peaks at very specific moments but without the continuity which tends to occur in other media such as television, where audience ratings tend to be more constant.

6 Conclusions

There is no pattern as regards regularity, nor concerning the length of the videos on the basis of which it would be possible to state that channels adapt (they reduce or increase video length, or they reduce or increase regularity). The behavior is erratic, as are the results (visits, likes, and dislikes). However, a positive relationship has been observed between frequency of video publication and length of the videos (the channels publishing the most videos each week also publish longer videos) and the opposite outcome as regards the profitability of this: Investing more time in publishing more frequently and with longer videos yields worse results in visits, likes, and dislikes.

The fact is that the channels with a lower weekly video publication frequency and videos of a shorter length have more visits. This may be because a forced schedule of uploading more than three videos a week gives rise to a lack of creativity and spontaneity, which children perceive. This result is deduced from the 'likes' given to the videos. The videos that are uploaded with a lower weekly frequency have more 'likes' because it seems they are more

appealing due to their originality and creativity as compared to those published more frequently, which seem to lose this aspect due to the increased number of videos uploaded to the platform.

These two results (erratic behavior and failure to adapt in view of the success modelled by frequency of publication and video length) are paradoxical. The success of a channel carries with it the monetization of that channel and, therefore, a supposed professionalization. However, this supposed professionalization does not bring with it an optimization of resources, understood in terms of a reduction of the times or a reduction in the frequency of video publication which is, according to our results, the most cost-effective. It would be advisable to conduct future research into that professionalization.

The analysis performed on the channels with a higher weekly video frequency rate (Group 1) shows that these are, on average, videos of a longer length than those belonging to Group 2 (13% longer). It might be imagined that with a higher frequency of videos (that is, greater dedication by the child to the channel), the videos would tend to be shorter in order to compensate for the time needing to be spent each week by the child, but precisely the opposite occurs. The United States is the country with the shortest videos (14.23 minutes on average), while Spain has the longest-lasting videos (16.28 minutes on average).

In view of the results obtained, the length and frequency must be deemed to be moderating variables with regard to success (understood in terms of visits, likes, dislikes, and interactions).

Despite this lack of a general pattern, it is possible to say that the success (or failure) of a video acts as a cause of the success (or failure) of the video or videos immediately following it (factors of proximity and recall), although the impact lessens until it disappears. However, this statement must take into account the possible effects of the algorithm YouTube may be applying and which has an impact (or not) on success, based on the parameters analyzed.

There is different behavior between countries. Children interact less with the US channels through likes and dislikes, and when they do they are neither critical nor negative. It seems that children who view US channels are more conformist with the content they see. Meanwhile, the children who interact with the British and Spanish channels are more active and participate more through their actions. This may be due to a cultural reason which could be examined in future studies.

This investigation provides a thus-far unexplored perspective, which looks into both YouTube production and consumption, in both cases (production and consumption) with regard to children aged under 14 and from a longitudinal perspective (which tends to be uncommon). However, based on the lines of study which have been opened up by this exploratory work, it would be useful to broaden the cultural contexts studied – in particular by covering other continents (while not recommending taking the continent as the only selection strategy but rather those countries which may represent marked cultural differences) – and investigate whether culture is sufficiently important with regard to creating and interacting with YouTube content. At the same time, it would be interesting to observe if professionalization of the channels in different countries occurs in the same way as with content production and whether the naturalness of the channels becomes less interesting for children who consume content.

Finally, a study combining analysis of the topics or narratives used in the videos and the data handled in this case (frequency, duration, etc.) would be worth future investigation, but it would then be necessary to consider a far more limited longitudinal analysis, as an N> 5,000 such as this study involves would require an excessive level of investment in resources.

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