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IZA DP No. 17666

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ABSTRACT

Behind the Screen: Gender Differences in the Creator Economy*

The content creator economy has rapidly emerged as a new labor market, enabling ordinary individuals equipped with a smartphone or a video camera to embark on real online careers. We analyze over 18,000 YouTube channels created in Italy between 2006 and 2023 and show that, despite being highly flexible and free of entry barriers, the content creator market has not proven capable of solving traditional gender gaps. Our findings indicate that men seized the opportunities offered by the digital world early on, while women began a significant entry only after 2011, with a peak during the COVID-19 pandemic. The thematic area of the content also varies by gender: women are predominantly active in the *Beauty* and *Food* topics, whereas men are more present in *Technology* and *Knowledge*. Furthermore, female content creators tend to have a shorter permanence on the platform and, despite producing more videos on average, they receive lower engagement and appreciation from audiences. We suggest several interconnected mechanisms that could possibly explain our findings: gender differences in interest in STEM and ICT fields and entrepreneurial skills; the lack of female role models, particularly in non-stereotypical domains; stereotypes and social norms influencing both content production and audience preferences; and greater female aversion to negative feedback.

JEL Classification: D9, J01, J16, J2

Keywords: gender differences, content creator, digital economy

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1. Introduction

In the heart of the digital revolution, a powerful and constantly evolving phenomenon is emerging: the content creator economy. Thanks to an increasingly digital and interconnected landscape, the preeminent figures of this market are simple individuals who, armed with a smartphone or a video camera, transform their passions and daily experiences into engaging content. The rapid evolution of digital platforms and the advancements in the quality of digital devices, give these individuals the opportunity for an increasingly large and diverse audience that allows them to monetize their work creating real, profitable online careers.

The content creators market bears only partial resemblance to the traditional labor market. The most noticeable difference is that it knows no geographic boundaries or barriers to entry: anyone who can create authentic, meaningful connections with audiences by generating and posting digital content across a range of digital platforms can become a digital artist, a storyteller, an opinion leader, an entertainer, or an educator. Digital content can cover virtually any imaginable topic, from lifestyle and beauty to technology, gaming, education, and beyond. Also, it ensures highly flexible working conditions, both in terms of working hours and workplace location (creators may work from home and they enjoy complete freedom in choosing how much content to upload, whether to work independently or collaborate with others, which time of the day to work, and so on) without requiring either capital input or specific educational degrees or work qualifications.

Research on the characteristics of the traditional labor market with a particular focus on the factors behind gender disparities has been a focal point for labor economists and has highlighted significant roles for entry discrimination, occupational segregation, need for flexibility especially due to the trade-off between family and career, and influence exerted on individual decisions by gender norms and stereotypes about gender-specific roles and attributes (Olivetti et al., 2024; Coffman et al., 2021; Bohren et al., 2019; Bertrand and Duflo, 2017; Olivetti and Petrongolo, 2016; Goldin, 2014). Studying what happens also in the digital work environment may shed further light on possible drivers of gender disparities and inspire policies aimed at bridging the gender gap. Nevertheless, to the best of our knowledge, possibly due to the absence of available data, gender disparities within the digital economy have yet to be thoroughly examined.

This paper aims to fill this gap by investigating precisely gender differences in the content creators market. We inquire whether, behind the glittering facade of no entry selection, no educational or professional requirements, no capital input, quick and easy money, and flexible working conditions, lie the same gender stereotypes, multidimensional gender gaps, and glass ceilings characterizing the traditional labor market.

In a nutshell, our research questions are: are there gender differences in access to and success in the content creators market? Is there gender segregation also in the digital industry? Is there a gender gap in the strategy chosen to achieve success and in its outcome?

We answer our research questions using a unique dataset of channels created on the YouTube platform. In particular, we collected data from the web on Italian channels created in the time period 2006-2023 and belonging to thematic areas (assigned by YouTube based on an algorithmic analysis of title, description and tags of the content posted by creators) that are rich in user-generated content that reflects individual creativity, personal interests, and expertise (*Food*, *Beauty*, *Technology*, *Fitness*, *Hobby*, and *Knowledge*). By looking at the channel thumbnail we assigned a gender to the creator ending up with 18,465 channels, about 58% created by males. Importantly, our sample is representative of the content creator population as it includes creators in all stages of their career, as opposed to other studies that focus only on the most influencing creators, those with an already established and high number of subscribers. For all channels, we downloaded several aggregate and content-level metrics, such as the number of videos, views, subscribers and likes, together with information on channel's creation date.

First, we analyze access to the digital market and show that males were the first to capitalize on emerging digital opportunities, while female channels began to gain traction only around 2011-2012, with a significant rise in 2020. However, female channels tend to be less enduring: over time, despite a similar or even higher share of new channels created by females, active channels remain predominantly male.

Next, we answer our second question on potential gender-based segregation and its evolution over the observed period by examining different the-

matic areas. We find that the area of *Beauty* is predominantly female while thematic areas such as *Technology* and *Knowledge* are mostly populated by male creators. Interest in the different thematic areas has shifted over time, both at the aggregate level and within each gender.

Lastly, we use the metrics obtained from the platform to explore whether male and female creators adopt different strategies in terms of quality and quantity of content provided and whether there are gender disparities in audience reach and loyalty, and the ability to engage and satisfy audience preferences. Our findings reveal that, despite putting in greater effort on average, female creators tend to receive lower levels of audience engagement and appreciation.

We identify several interconnected mechanisms that might explain gender disparities in the content creation market. The first is a technology skills gap with women's lower representation in STEM and ICT fields explaining their delayed entry in the digital industry and their interest for less technical content. Also, it is possible that women turn to content creation mainly during periods of economic downturns, treating it as a self-employment opportunity due to its flexibility and control over work timing, place, quantity, variety, and effort. However, just like in traditional self-employment, starting a career as a content creator requires entrepreneurial skills and the lower presence and success of women may be explained by them being endowed with lower entrepreneurial talent, which impacts their ability to grow and sustain digital careers. Many women enter the digital market but exit quickly due to

challenges similar to those faced in traditional entrepreneurship.

An additional mechanism may be the lack of female role models: examples of successful female creators are very scarce and often confined to stereotypical fields like beauty, and this may limit the aspirations of new female creators. This channel is strongly intertwined with gender stereotypes and social norms that influence both content production and audience preferences, which tend to favor content that aligns with traditional gender roles, disadvantaging women in male-dominated sectors. Finally, as a further possible mechanism that may discourage women from entering and staying in the digital market, we propose gender differences in the sensitivity to negative feedback with women being more averse to criticism than men.

As a closing thought, the restriction to the Italian digital market which might appear as a weakness of the paper in terms of external validity, is instead our strength because the gendered nature of the Italian language allows us to check the robustness of the graphic gender assignment by using the words contained in the channel description. In addition, unlike English content, the comprehension of Italian likely increases the probability that content produced in Italian is consumed primarily within the same market. This reduces external cultural influences on data regarding channel views and subscriptions and proves very important for studying the role of gender norms.

The remainder of the paper is organized as follows. Section 2 presents a brief overview of the related literature. Section 3 presents the data collected

from the web. In section 4 we answer our research questions by studying gender differences in access to the digital market, distribution of creators in the thematic areas considered and effort, performance, and audience appreciation. Section 5 presents a discussion of the mechanisms that could drive our findings. Finally, section 6 concludes the paper.

2. Literature

Our work contributes to two strands of the literature. First, we enrich the economic literature studying the existence and reasons of gender disparities in labor market outcomes. Olivetti et al. (2024) present a comprehensive analysis of the evolution of gender disparities in the labor market, highlighting the interplay between economic, cultural and policy influences. They emphasize the role of social norms and stereotypes about gender roles and attributes that, in turn, may shape skills, traits and preferences, and fuel both market and pre-market discrimination. The observed discrimination may be either statistical, that is relying on rational (accurate or biased) beliefs about the abilities or skills of the group an individual belongs to (Bordalo et al., 2016; Arrow, 2015; Phelps, 1972), or taste-based, that is rooted in preferences and based on the dislike of a group, by animus or prejudice, on the part of discriminating individuals (Becker, 1957). We contribute by complementing studies on the traditional labor market with an analysis of the role of gender in the digital market, where the absence of entry barriers allows these dynamics to operate differently, possibly exerting an influence mainly through pre-market

factors and professional growth.

Gender norms are particularly salient at parenthood influencing rewards tied to economic decisions and penalizing men and women who deviate from the traditionally designated role of, respectively, *breadwinners*, those responsible for the financial needs of the family, and *caregivers*, those with the main responsibility for domestic chores (Akerlof and Kranton, 2000). In the traditional labor market, parenthood further raises the need for greater flexibility in working conditions, such as remote work opportunities. However, as long as women remain the primary caregivers for children, multitasking between remote work and childcare may exacerbate the gender gap.

The digital economy might offer a unique opportunity to overcome these barriers, as work can not only be performed from home but also customized to align with the worker's specific role, personal traits, and family situation (for instance, many creators involve their children in their content). Therefore, a comprehensive understanding of the role of gender in the labor market cannot overlook the study of the digital economy and this paper makes the first step in this direction. Xue et al. (2024) argue that the digital economy significantly improves female autonomy both economically and spiritually, particularly for women with spouses and children, because it alleviates the marriage and motherhood penalty by offering flexibility and compatibility with women's characteristics. The digital economy creates new roles that align with women's strengths and offers promising opportunities for growth. Its inherent flexibility could, in principle, make it more accessible and ap-

pealing to women, potentially avoiding some of the selection biases found in traditional labor markets.

The second strand of literature we contribute to is the emerging literature on the content creator economy. Three are the main actors of this new market. On the supply side, there are artists/creators who produce various forms of digital content (e.g. videos, articles, images, music, or animations) across one or more platforms (e.g. social media, blogs, or YouTube). On the demand side, there are two agents: the community/audience that consumes content, interacting with and responding to content through actions such as likes, comments, shares, clicks, views, and subscriptions; the advertisers that are attracted by the presence of a loyal and engaged audience and connect with content creators to promote their products or services in exchange for financial compensation or resources to support the artist's creative endeavors.

Some studies have identified the important role of creators on several aspects of our society. For example, Aran-Ramspott et al. (2018) highlight that YouTubers are entertaining and closely connected to the digital culture shared among adolescents, making them highly relatable to younger audiences. However, because of their strategic role in fueling the market, most of the literature studying the content creator economy has focused on the link between advertisers and creators. For instance, Rieder et al. (2023) analyze the number of affiliate links connected to external products included in the video descriptions of YouTube channels with at least 100,000 subscribers, finding that the platform bases much of its strategy on the economic pres-

sures it places on its creators. Similarly, Schwemmer and Ziewiecki (2018) reveal that on average, more than two affiliate links are present in sampled videos. Further exploring monetization practices, Hua et al. (2022) utilize the YouNiverse dataset[1] to investigate monetization strategies, discovering that alternative monetization methods via URL links, such as direct donations through cryptocurrencies, are extremely widespread among popular channels.

Nevertheless, advertisers typically become involved only after creators have attracted a substantial and loyal audience. Therefore, a proper understanding of this market should begin by examining creators and their decision regarding whether, how, and when to offer their work within the digital industry. Our paper seeks to provide a picture of the content creator market by focusing on the supply side through the lens of gender. This is the first step of a broad research agenda that by following creators since their first content and by combining metrics downloaded from the web with experimental data aims to get a deep understanding of possible gender disparities in creators' strategies, opportunities, perceptions, and success.

3. Data

In this section, we discuss the methodology used to collect data online and present descriptive statistics for the sample included in the analysis.

[1] A dataset that at the time of their research covered approximately 25% of YouTube channels with more than 100,000 subscribers and about 35% of channels with over 10,000 subscribers

3.1. Data collection

We collected web data on channels created on the YouTube platform. YouTube (YouTube, 2024; Wikipedia, 2024) stands as the pioneering platform within the online creator economy, primarily due to its vast reach and its early recognition of the potential of digital video content (see Appendix A for a detailed description of the main features of the YouTube platform). For content creators, YouTube provides access to the most comprehensive infrastructure for monetization, audience growth, and content discovery.

We collected data using YouTube's Data API (version 3), which provides comprehensive access to metadata associated with public YouTube channels. We considered the time frame from January 2006 to December 2023[2] and targeted the Italian market because certain peculiarities of the Italian language (for example, the qualifying adjective agrees in gender with the noun to which it refers) are very useful for gender classification. In addition, unlike English content, Italian-language content is more likely to be consumed within the same market, reducing external cultural influences on data related to views and subscriptions.

YouTube channels are automatically assigned to thematic areas based on an algorithmic analysis of video titles, descriptions, and tags.[3] To investi-

[2]The period considered encompasses 18 years of data on YouTube creators. Since the YouTube API restricts each request to a maximum of 600 channels per time period, we collected data in quarterly increments, ensuring a large and representative sample of channels for each period.

[3]Content creators add keywords and tags to guide the classification of their videos. YouTube employes an algorithm to classify channels into thematic areas and incorporates

gate the presence of gender segregation in the digital market, we prioritized collecting data from channels belonging to thematic areas with content produced by emerging creators who generate original material rather than those using the platform to redistribute existing works.

We chose to focus on the broad category of Lifestyle, which encompasses various thematic areas such as *Food*, *Beauty* (Physical Attractiveness), *Technology*, *Fitness*, and *Hobby*. These subtopics primarily feature content driven by personal creativity, expertise, and unique expression. Creators in these areas tend to share original content that reflects their experiences, skills, and insights. In addition to the Lifestyle category, we included the topic *Knowledge*, which, although not classified under a single main category, is integral to our analysis because it can reveal patterns of gender differences in content creation.

To identify key content themes within each selected area, we extracted the most frequently used words in the descriptions of YouTube channels belonging to each category and produced corresponding word clouds (see Appendix B).

We decided to exclude other available thematic areas because they do not contain original personal content (or include only a small portion of it) from emerging creators. *Music* is a topic that mostly features established artists using YouTube primarily as a distribution platform or creators who share

this information into its recommendation system to enhance content discovery and search result alignment with user interests.

pre-existing musical content rather than developing original content from scratch. Similarly, *Entertainment* is dominated by professionally produced content, such as TV shows and movies, while *Sports* primarily features highlights and professional events; both lack the individual creator aspect central to our study. The thematic area *Society*, encompassing subtopics such as *Religion*, *Military*, *Politics*, *Health*, and *Business*, often involves institutional messaging or advocacy, which could shift the focus away from individual content creation to organizational agendas. Finally, while *Gaming* contains abundant user-generated content, it remains a specialized niche with distinct dynamics, making it less suitable for our broad examination of personal content creation.

The preliminary data set consisted of approximately 110,000 channels and it included general information such as the channel registration date, channel name, channel description, and the channel's thumbnail link.

Due to the way the YouTube API functions[4] we cleaned the data to retain only channels with descriptions written exclusively in Italian, which accounted for approximately 53% of the total dataset.[5]

To objectively determine the creator's gender, we used the thumbnails (i.e. the profile pictures that creators chose for their YouTube channels) of the

[4]The YouTube API can return results that do not strictly adhere to the specified parameters, often providing content to fulfill the query even when exact matches are not available, thereby adding noise to the data.

[5]We followed Ribeiro and West (2021) and implemented a Python-based algorithm, *langdetect* (version 1.0.9), to filter channels by the language of their descriptions.

channels in the resulting dataset. We classified all channel thumbnails into three categories: *Females* (about 13.5%), *Males* (18.82%), and *Non-human* (where the creator's gender could not be objectively determined because, for example, the thumbnail consisted of a symbol).[6] As a further refinement, we removed 67 channels from the *Males* and *Females* categories whose names contained specific terms (e.g. S.p.a. or S.r.l.[7]) indicating that they represent entities (such as companies) rather than individual creators.

For all channels classified as *Males* and *Females*, we collected weekly data on aggregate metrics such as the number of videos, views, subscribers, and received likes and several content-level metrics. For the purpose of the paper, we consider data collected on May 27^{th} 2024.[8] For 183 channels (98 classified as *Males* and 85 as *Females*) it was impossible to download metrics on the chosen day, possibly due to the content creators receiving some restrictions imposed by YouTube for copyright violations or violations of the community

[6]To further analyze the nature of channels classified as *Females* and *Males*, we introduced five subcategories based on the content and style of the thumbnails: *neat* for thumbnails representing a clear face of the creator, even if stylized; *neat with children* for pictures featuring the creator's face alongside children, which often signal family-oriented content; *cartoons* for thumbnails featuring a male or female cartoon character representing the creator; *body* for thumbnails representing only parts of the body identifiable as belonging to men or women; *text* for thumbnails where the gender of the creator was inferred from the name or text included in the image, rather than a visual representation.

[7]The full list of terms is: Agenzia (Agency), Associazione (Association), Biblioteca (Library), Dipartimento (Department), Ditta (Company), Ente (Public body), Gruppo (Group), Hotel, Istituto (Institute), Pizzeria, Ristorante (Restaurant), S.n.c. (Copartnership/Unlimited Partnership/General Partnership), S.p.a. (Joint Stock Company), S.r.l. (Limited Liability Company), S.r.l.s. (Simplified Limited Liability Company), Società (Society/Company).

[8]Weekly data on both aggregate metrics and content details are analyzed in another paper.

norms set by the platform. Therefore, we dropped them from the sample.

After processing, the final dataset consisted of 18,465 channels, with 7,713 classified as female creators (approximately 42%) and 10,752 classified as male creators (about 58%).

We checked the robustness of our classification using a subsample of 4,000 channels randomly extracted from the sample containing *Males*, *Females*, and *Non-human* channels with Italian descriptions. Instead of relying on thumbnails, we classified this subsample by examining the channel's description and name to determine the creator's gender.[9]

Figure 1 shows a comparison between the two classification methods—one based on thumbnails and the other based on channel descriptions and names. As illustrated in the figure, the two methods exhibited strong agreement: approximately 93% of the channels classified as male based on thumbnails ended up in the same category when using the description method. A similar pattern was observed for channels classified as female, with about 93.5% agreement between the two methods.[10]

[9]Unlike English, the Italian language has the peculiarity of being gender-specific. This makes it easier to identify the subject's gender based on the ending of the words used. For instance, if a description states "Sono da sempre appassionata di cucina" (I have always been passionate about cooking), the adjective *appassionata* indicates that the speaker is female, whereas a male speaker would use *appassionato*.

[10]Among the channels classified as non-human, the majority (77.4%) remained in the same category when classified based on descriptions and names. Instead, 8.5% and 14.1% of channels corresponded, respectively, to female and male creators who selected a thumbnail that did not clearly disclose their gender. However, this error is consistent with the overall distribution of males and females in the main sample.

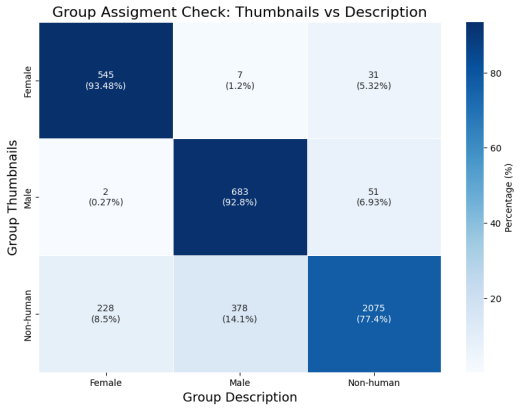

Figure 1: Gender assignment comparison: Thumbnails vs Description

This robustness check demonstrates the reliability of our gender classification method, ensuring that the final dataset accurately represents gender differences in the YouTube content creator market.

3.2. Descriptive statistics

Table 1 presents descriptive statistics both overall (column 1) and separately by gender (columns 2 and 3). The last column shows the p-values for the t test on the equality of means. We first present the channel characteristics used as control variables. Then, we present our outcome variables divided into three groups: *Effort* includes outcome variables used to study gender differences in the strategy adopted in terms of quantity and quality of content produced on the digital platform by creators; variables in the *Audience* group help assess the ability to attract a numerous and loyal audience while those in the *Feedback* group answer the question on the ability to satisfy the audience's preferences thus stimulating its engagement and gaining its appreciation.

	All (1)	*Males* (2)	*Females* (3)	*P-value* (4)
Channel characteristics				
Year creation channel	2,014.70 (4.70)	2,014.21 (4.93)	2,015.38 (4.27)	<0.001
Time to first video	929.71 (1,215.02)	967.71 (1,269.51)	876.75 (1,132.65)	<0.001
Years first to last video	4.27 (4.07)	4.79 (4.40)	3.55 (3.44)	<0.001
Beauty	0.09 (0.29)	0.01 (0.07)	0.22 (0.42)	<0.001
Fitness	0.18 (0.38)	0.20 (0.40)	0.16 (0.36)	<0.001
Tech	0.14 (0.35)	0.21 (0.41)	0.04 (0.20)	<0.001
Hobby	0.21 (0.41)	0.21 (0.41)	0.20 (0.40)	0.045
Knowledge	0.18 (0.38)	0.23 (0.42)	0.11 (0.31)	<0.001
Food	0.20 (0.40)	0.15 (0.36)	0.27 (0.44)	<0.001
Effort				
Videos	116.30 (261.50)	121.07 (276.04)	109.65 (239.61)	0.003
Tot video hours	20.03 (87.43)	20.96 (94.67)	18.73 (76.17)	0.088
Avg duration mins	8.28 (9.97)	8.05 (10.22)	8.61 (9.60)	<0.001
Share video HD[#]	0.84 (0.27)	0.84 (0.26)	0.83 (0.28)	<0.001
Delta videos[+]	1.87 (12.91)	1.95 (14.27)	1.74 (10.71)	0.271
Audience				
Views	1,670,947.93 (17,648,280.01)	1,699,848.07 (17,865,444.22)	1,630,660.85 (17,342,086.20)	0.793
Avg views	7,741.76 (158,319.05)	8,640.14 (196,251.50)	6,489.41 (79,471.56)	0.363
Views per sec	83.03 (1,539.98)	96.94 (1,891.86)	63.65 (829.33)	0.147
Subscribers	6,854.25 (50,680.98)	6,916.36 (48,257.16)	6,767.68 (53,881.26)	0.844
Delta views[+]	33,383.02 (1,032,605.31)	34,881.13 (1,315,408.77)	31,293.59 (374,497.99)	0.816
Delta subscribers[+]	107.29 (1,362.84)	125.44 (1,664.97)	81.98 (761.96)	0.033
Feedback				
Avg like	159.78 (1,777.38)	187.85 (2,224.10)	120.66 (815.42)	0.011
Like per sec	2.14 (29.47)	2.57 (34.06)	1.55 (21.49)	0.020
Like per view	0.04 (0.04)	0.04 (0.04)	0.05 (0.04)	<0.001
Avg comments	9.96 (86.22)	10.53 (110.17)	9.17 (29.59)	0.293
Comments per sec	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.023
Comments per view	0.01 (0.02)	0.01 (0.02)	0.01 (0.03)	<0.001
Neg feedback	0.04 (0.11)	0.04 (0.09)	0.05 (0.14)	<0.001
Obs.	18,465 (100%)	10,752 (58.2%)	7,713 (41.8%)	

[+] For the variables *Delta videos*, *Delta views* and *Delta subscribers* we have 18,456 observations (10.749 male channels and 7,707 female channels).

[#] For the variable *Share video HD* we have 18,441 observations (10.731 male channels and 7,710 female channels).

Table 1: **Descriptive statistics**

Our sample is composed of 18,465 channels, 58.2% created by male creators. The table shows that, on average, channels were created in 2014, both overall and within the male creators' sample. Female-created channels, however, are significantly more recent.

Figure 2 shows the distribution of new channels in the period considered.

New channel creation increased in 2007, remained stable until 2010, and then experienced two spikes: one in 2012–2013 and another in 2020.

As we will show in Section 4.1 and Figure 5, the first spike corresponds to a growing interest among female creators in the platform. The 2020 spike, in contrast, is likely linked to the Coronavirus pandemic and associated lockdowns, which increased the appeal of online platforms, especially for females.

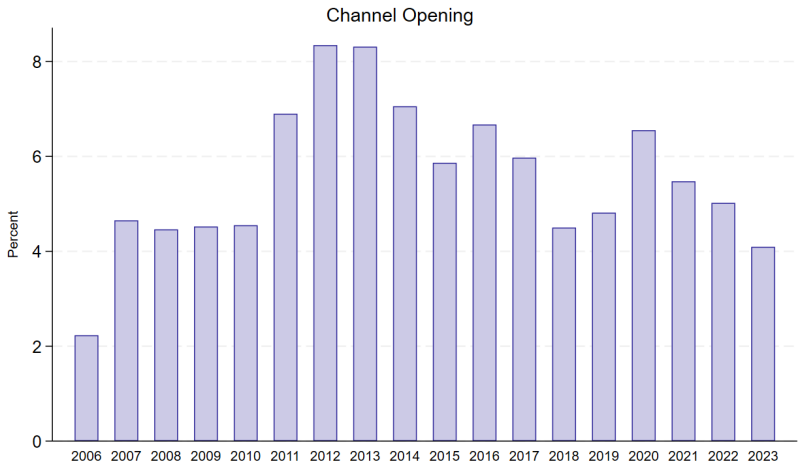

Figure 2: Distribution of new channels

Creating a channel does not necessarily mean being active on the platform. Some creators launch their channels because they already have content to share or intend to create and share content immediately. Others, however, open their channel attracted by the digital market but become actually active on the platform only after some time. Additionally, some channels originate from individuals who initially created an account as users but later, upon discovering the opportunities in the digital economy, decided to become cre-

ators. The data seem to support this explanation as the average time from channel creation to the first content upload is 929.71, about 2 years and a half. Also, the lag is higher for the first years and becomes considerably lower for more recent years, suggesting that older channels are more likely to belong to users who transitioned into content creation later, whereas more recent channels are often created with this specific intent. Interestingly, the lag is significantly shorter for females. An analysis of gender differences by year reveals that *Time to first video* is significantly higher for females in the years 2007-2009 suggesting that, among the first users of the platform, females took significantly more time to exploit the opportunities of becoming creators. No significant gender differences are observed until 2014 when female creators exhibit a significantly shorter *Time to first video*. This gender gap remains statistically significant in 2016, 2018, and 2022 suggesting that females' entry in most recent years is driven by the specific intent of sharing content.

Once a channel is created, it remains on the platform even if the creator does not upload any content, and it only disappears if the creator deletes it. To study the effective presence of male and female creators on the platform, we consider the date of the last published content (up to the date of data collection, May 27^{th} 2024) and define a channel as *active* in a given year only if it has published at least one piece of content during that period. Figure 3 shows the distribution of channels active on the YouTube platform. We find clear evidence of an increasing trend, reflecting the expansion of the digital

economy, which peaks during pandemic years, before slowly decreasing.

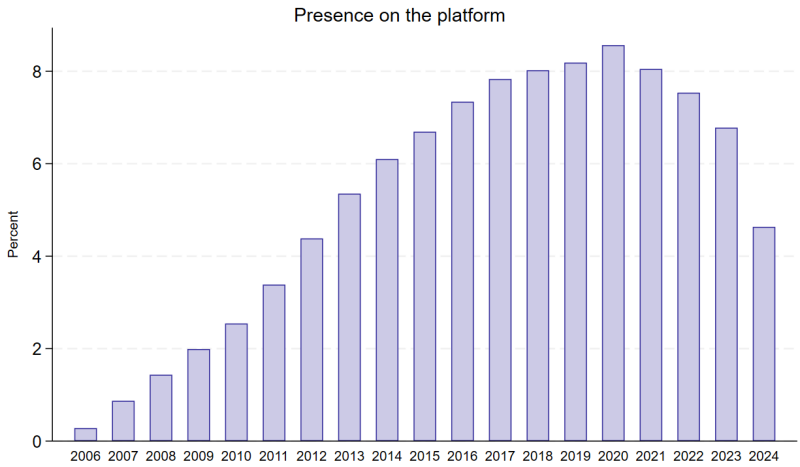

Figure 3: Distribution of active channels

To measure a creator's experience, namely the duration of their activity on the platform through content sharing, we measure the interval between the last and the first content uploaded (*Years first to last video*). We see that, on average, creators stay active for slightly more than 4 years. Gender differences are also relevant along this dimension: not only do female creators join the platform later, but they also remain active for a shorter period. The average date of the last uploaded video is significantly more recent for male creators than for females (28^{nd} February 2022 *vs* 1^{st} November 2021).

When entering the creator market, creators may assign one or more tags to their videos to suggest the thematic area for their content. Data show that 21% and 20% of observed channels belong to *Hobby* and *Food*, respectively. The share of channels categorized under *Fitness* and *Knowledge* is 18%, while

creators deciding to upload content in the areas *Tech* and *Beauty* are, respectively, 14% and 9% (see Figure 4 for a graphical representation of the share of channels in each topic).[11] The distribution of channels by thematic areas is significantly different by gender: female creators are overrepresented in *Beauty* and *Food*, whereas male creators dominate the remaining categories. We will dig deeper into these differences in section 4.2.

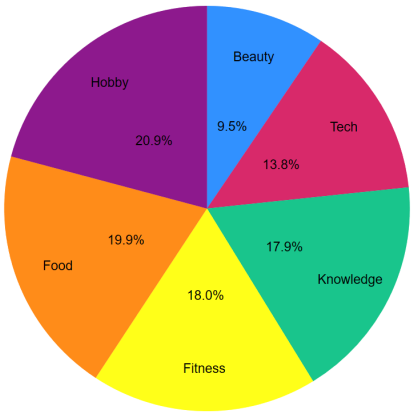

Figure 4: Share of channels in each topic

In Table 1, when we turn our attention to the outcome variables representing our indicators of effort exerted on the platform, we find that creators have published on average 116 videos for a total of 20 hours on average. Videos last on average 8 minutes, and about 84% of them are published in high definition.[12] The variable *Delta videos* measures the change in the num-

[11] 5.8% of channels is classified according to the YouTube algorithm as belonging to more thematic areas. For these channels we consider the first thematic area proposed. The distribution is very similar if we consider the other thematic areas assigned by YouTube.

[12] YouTube introduced the possibility to publish in high definition on 1^{st} December

ber of videos uploaded by the channel in the one-month period running from May 27^{th} 2024 to July 1^{st} 2024.[13] and is our indicator of the dynamic of the channels in terms of content creation. On average, the number of videos posted increases by about 2 in the period of one month that we considered.

Male and female creators exhibit significantly different levels of effort on the digital platform. Data show that, compared to male creators, female creators post fewer videos, share less total content, produce longer videos, and have a lower share of high-definition content. The observed differences in effort may reflect the more recent entry of females onto the platform. In Section 4.3, we will conduct a parametric analysis of gender differences, controlling for channel characteristics, which will reveal higher effort levels among female creators.

The variables in the *Audience* panel serve as indicators of a creator's ability to attract and retain a large, loyal audience. On average, channels attract 1,670,948 views, each shared video receives 7,742 views, and each second of posted content garners 83 views. On average, creators attract 6,854 subscribers. As explained in section 3.1, we consider the universe of Italian channels, with subscribers count ranging from 0 to 3,210,000. Over the one-month period analyzed, views increased by an average of 33,383,

2008. We compute *Share video HD* as the share of videos shared after this date that are classified by the platform as having high definition.

[13]The period considered is slightly longer than one month, as we ensured data collection always occurred on the same weekday (Monday) to mitigate potential fluctuations in weekly trends.

while subscribers count grew by 107. Despite differences in effort, male and female creators achieve similar numbers of views and subscribers. The only statistically significant difference is in *Delta subscribers* which is lower for females.

Regarding audience engagement and appreciation (panel *Feedback*), channels receive on average about 160 likes per video, 2 likes per seconds of content uploaded on the platform, and 4 likes per 100 views. Comments are considerably fewer than likes: channels receive on average about 10 comments for each video shared, 0.18 comments for an hour of content $(0,00005 * 3600)$, and 1 comment for 100 views. The variable *Neg Feedback* measures the proportion of videos where the number of comments exceeds likes. If we assume that individuals who take the time to comment without also leaving a like (a simpler and quicker action) are more likely to express negative feedback, then a higher *Neg Feedback* value indicates greater dislike expressed by the audience. Since YouTube does not provide downloadable data on *dislikes*, we use this metric as a proxy for audience dissatisfaction. The share of videos with more comments than likes goes from 0 to 1, the 50^{th} percentile is 0 and its average value is 0.04. That is, channels have on average about 4% of videos with more comments than likes.

Audience appreciation differs significantly by gender: female creators receive fewer likes per video and per second of posted content but more likes per view compared to male creators. Moreover, while there is no significant gender difference in the average number of comments per video, female creators

receive significantly fewer comments per second than male creators (0.000043 *vs.* 0.0000554) but more comments per view (0.0114754 *vs.* 0.006357). Finally, female creators receive significantly more negative feedback on their content compared to male creators.

4. Results

Our analysis of gender differences in the content creator market follows three key steps corresponding to our three research questions. First, we examine access to the digital market and provide graphical evidence showing that male creators were the first to capitalize on emerging digital opportunities, while female channels began to rise only after 2011, with a notable increase in 2020. However, female channels are less enduring because, over the years, even if the share of new channels is similar (or even higher for female channels), the majority of active channels remains male-dominated.

Next, we analyze different thematic areas to explore potential gender segregation and its evolution over time. We find that female creators predominantly contribute to *Beauty* and *Food*, whereas the thematic areas *Knowledge* and *Technology* are dominated by male creators. Graphical analysis further indicates that interest in different thematic areas has evolved over time, both overall and within each gender group.

Finally, we analyze channel-level metrics and conduct econometric analyses to examine gender differences in three key areas: effort exerted on the digital platform, ability to reach a large and loyal audience, and ability to

satisfy the audience's preferences—thereby fostering engagement and appreciation. Our findings indicate that, despite exerting greater effort on average, female creators receive lower levels of audience engagement and appreciation.

4.1. Gender differences in access to the digital market

Our data reveal important gender differences in access to the content creators market. Figure 5 shows the distribution of new channels by gender in the period considered in our sample. Male creators were the first to enter YouTube, dominating its early phase and rapidly increasing their presence from 2007, reaching a peak in 2012–2013. In contrast, channels created by female creators were sparse in the platform's early years, experiencing a notable increase only around 2012 and reaching another peak in 2020. Both the Epps–Singleton characteristic function test (ES) and the two-sample Kolmogorov-Smirnov equality-of-distributions test (KS) reject the null hypothesis of equal distributions between new male and female channels (p-value=0.000).

Figure 6 presents the share of male and female channels opened each year. The digital market remained predominantly male-dominated throughout the observed period, except in 2015, when male and female creators entered at equal rates, and in 2020, when female channel creation surpassed that of males. A possible explanation for such a significant increase in female-created channels in 2020 may lie in the spread of the COVID-19 pandemic. Widespread lock-downs confined people to their homes, accelerating the shift to digital platforms and likely encouraging especially women - more penalized

by the labor market crisis (see section 5) - to utilize YouTube as a viable platform for creative expression and income generation.

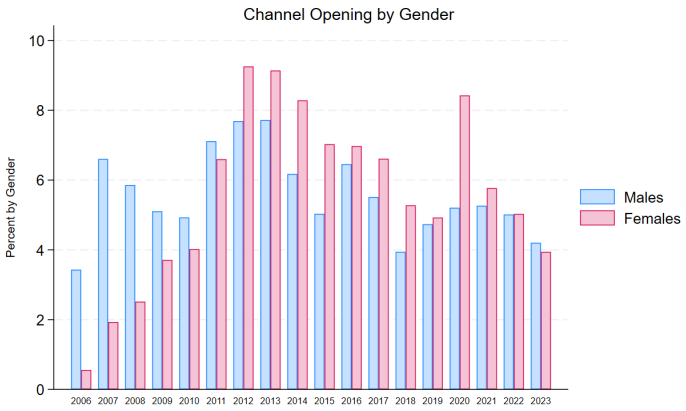

Figure 5: Distribution of new channels by Gender

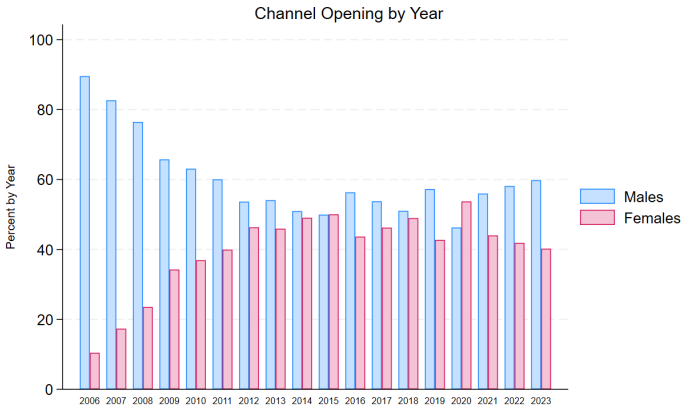

Figure 6: Share of male/female new channels by year

Analyzing channel openings reveals that access to the digital market followed different patterns for male and female creators, with female creators consistently showing less interest in leveraging digital opportunities—except

in 2020. However, since the digital labor market is very flexible, as it has no entry barriers and does not require creators to publish content or remain active after opening an account, studying only channel opening may be not fully representative of the presence on the platform. Therefore, we consider only active channels by year[14] and see that the distributions of male and female active channels are both skewed to the right with male active channels being in a slightly higher number in the initial years and female active channels being more present in recent years (Fig. 7). Also for active channels, both the Epps–Singleton characteristic function test (ES) and the two-sample Kolmogorov-Smirnov equality-of-distributions test (KS) allow to reject the null hypothesis that the distributions of male and female active channels are equal (p-value=0.000).

In fact, when we look at the share of male and female active channels by year (Fig. 8) we see that the digital labor market is always dominated by males.

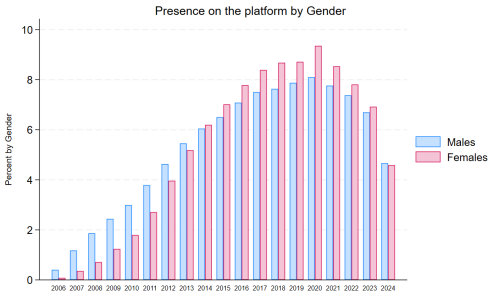

Figure 7: Distribution of active channels by Gender

[14]Channels are defined *Active* in a given year if they have published at least a content in that year.

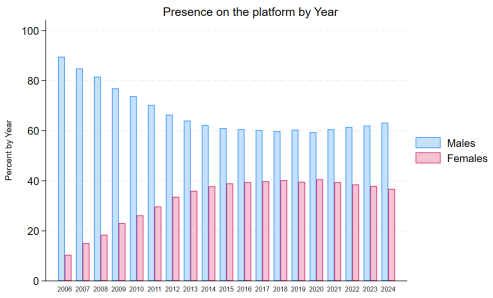

Figure 8: Share of male/female active channels by year

4.2. Gender differences by thematic area

Studying gender differences in the aggregate digital labor market may mask important heterogeneity if male and female decisions to enter (and be active) in the digital market depend on the thematic area.

Figure 9, reporting the distribution of channels by gender separately for each thematic area, shows evidence of gender segregation also in the digital economy. In particular, the topic *Beauty*, which identifies those channels where YouTubers tend to discuss the care of all or parts of their body, is almost entirely covered by females (97.2%). On the other hand, males dominate the topics of *Technology*, contributing with 86.8% of the channels, and *Knowledge*, contributing with about 74% of the channels.

Other topics that are less gender-stereotyped show a more balanced gender representation. Male channels are about 64% and 60% of the topics *Fitness* and *Hobby*, respectively, and about 44% of the topic *Food*. The clear gender segregation across topics underlines the importance of considering gender dynamics when analyzing content creation trends. In Appendix C (Figs. 19 to 24) we report the word clouds of our six thematic areas, sepa-

rating male and female creators, to get some insights from the most frequent words used in their descriptions. In summary, what we observe is a subtle difference in how the two groups present themselves, with female creators showing a tendency toward holistic, lifestyle-oriented content and male content coming across as more specialized, with a focus on technical skills, or specific technological tools and platforms.

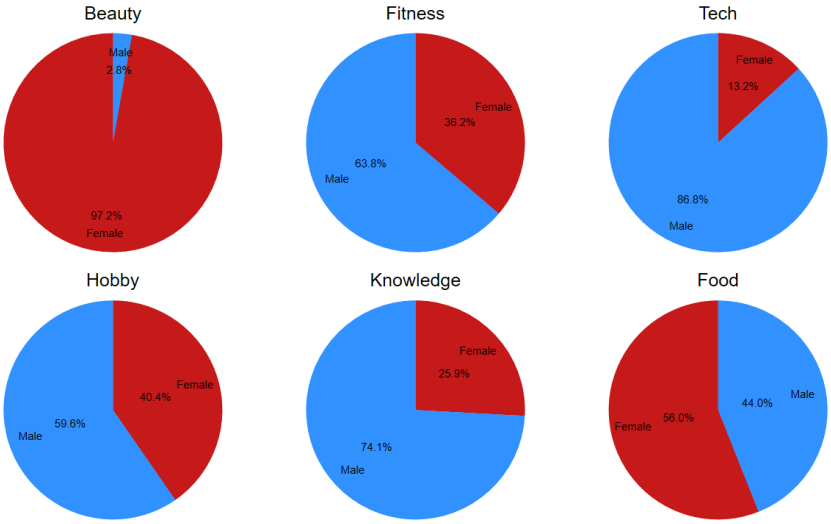

Figure 9: Share of male/female channels in each thematic area

The evidence of heterogeneity by thematic areas not only highlights the preferences of each gender in choosing their content niche but also suggests that there might be underlying factors that could be influencing these choices, such as cultural norms, perceived expertise, or market opportunities. In section 4.3 we will study whether also audience engagement and appreciation for male or female creators vary by thematic area to shed more light on this

subject matter.

The digital economy even more than the traditional labor market evolves rapidly both in terms of features and content characteristics and, above all, in terms of audience demand for content. Therefore, the distribution of channels by topics, both overall and by gender[15], may vary over time. To investigate this aspect, in Figure 10 we report, for each year, the share of new channels in each topic, both overall and by gender. Data show that in the first years, the channels were opened predominantly to share content regarding *Hobby*, *Knowledge*, and to a lesser extent, *Tech*. However, over the years, also content regarding *Food*, *Fitness* and *Beauty* has become available on the platform and the thematic areas have become almost equally distributed.

[15]See Appendix D for the gender distribution of new and active channels by thematic area.

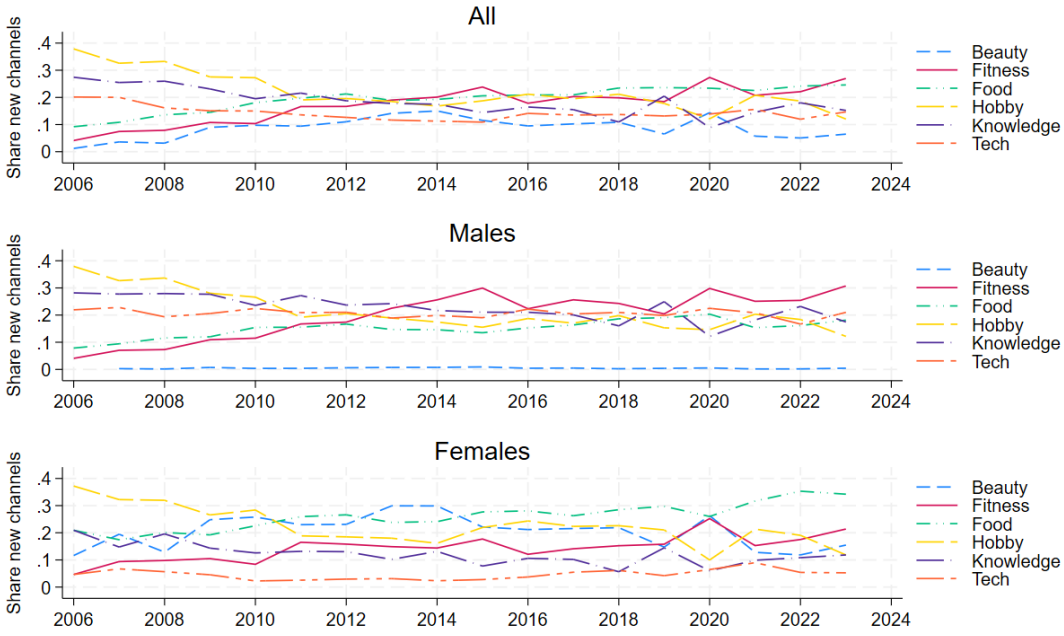

Figure 10: Share of new channels in each topic by year, overall and by gender

As further evidence that the digital market adapts almost instantly to audience needs, we observe a spike in the thematic areas *Fitness* and *Beauty* in 2020. This spike coincides with the COVID-19 lock-downs when in-person gym attendance was restricted, leading people to exercise at home. In fact, sales of home fitness equipment surged during the pandemic. For instance, Peloton, a leading company in home fitness equipment, experienced a dramatic increase in sales, doubling its revenue to an estimated $1.8 billion by the end of 2020 (World Economic Forum, 2020). Additional reports indicate that fitness-related apps and equipment saw a significant rise in downloads and purchases, as more people invested in improving their home gyms (BBC,

2020).[16]

Similarly, the spike in *Beauty* can be attributed to the closure of hairstylists, estheticians, and barbershops during the early months of the pandemic. With professional services unavailable, many individuals turned to YouTube for tutorials on managing their beauty routines at home, such as haircuts, makeup, and skincare. This growing demand for beauty-related content not only encouraged existing creators to produce more tutorials but also might have led to many professionals from the beauty industry opening YouTube accounts to share their expertise.

We also observe a spike in the thematic area *Hobby* soon afterward, when restrictions to movements were removed, as people started again with outdoor activities.

When looking at the data separately by gender, we see that for male channels there is a positive trend in the thematic area *Fitness* while the disinterest for the subject *Beauty* is constant over time. On the other hand, over the years, females' interest in the topic *Beauty* remains high and pretty stable, while *Food* and *Hobby* show, respectively, an increasing and a decreasing trend.

To study more in depth whether there is gender segregation in the digital industry, namely whether for a given topic a particular gender dominated the market over the years, in Figures 11 and 12 we show the share of male

[16]BBC: https://www.bbc.com/news/technology-55318822

and female new and active channels, respectively, in each year for a given thematic area. We see that female content creators clearly dominate the the thematic area *Beauty* in all the years considered in our sample while they started to dominate the thematic area *Food* only starting from 2011 as regards the opening of new channels (Fig. 11) and from 2014 in terms of active presence on the market (Fig. 12). All the remaining thematic areas see a definitely higher number of male content creators throughout the entire period considered, in terms of both access to and active participation in the market.[17]

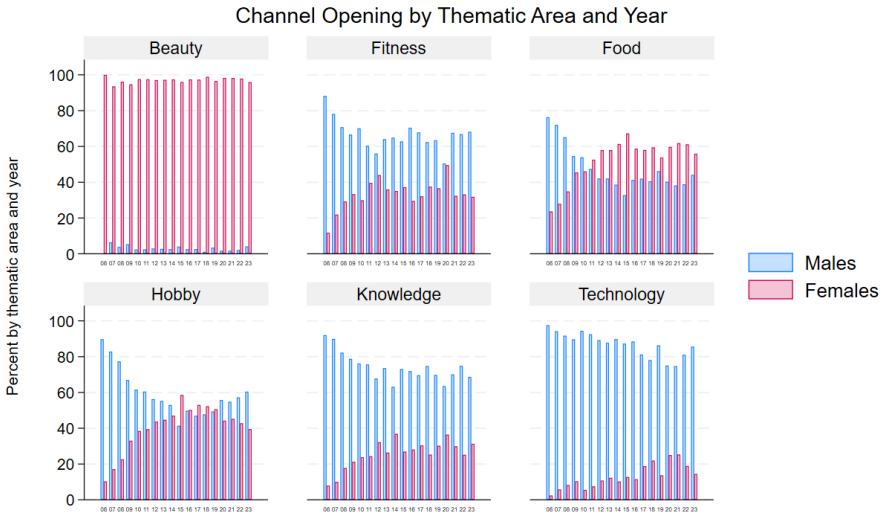

Figure 11: Share of male/female new channels by year in each thematic area

[17] Although female creators outnumbered males in *Hobby* among newly created channels between 2015 and 2019 (Fig. 11), when considering active channels male creators maintained dominance in this thematic area throughout the entire period analyzed (Fig. 12).

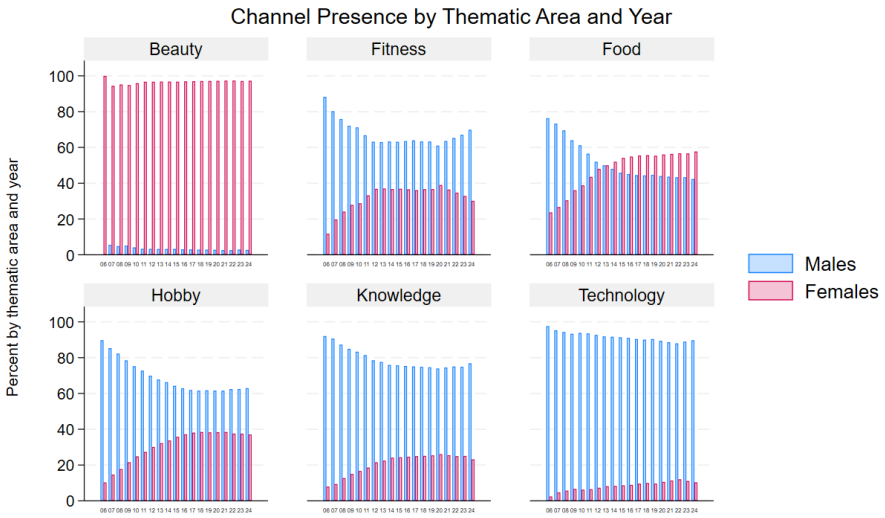

Figure 12: Share of male/female active channels by year in each thematic area

4.3. Effort, performance and audience approval

In this section, we use the metrics of the channels to study whether males and females exert a different amount of effort on the digital market and whether they obtain a different return for their effort in terms of audience reach and appreciation attained.

Tables 2 to 4 present the coefficients (and standard errors) of the dummy *Female* for OLS estimates having as dependent variable the variable indicated in the column. These estimates are conducted on both the full sample (*All*) and subsamples defined by the channel's thematic area. It is important to note that all estimates include *Date channel creation*, *Time to first video*, and *Years first to last video* among controls. Additional controls, if present, are reported in the notes to the table. Standard errors are corrected for heteroscedasticity.

In Table 2 we study whether male and female creators differ in the effort they exert once they have decided to open their channel. We consider as indicators of effort the number of videos posted (column 1), the total (column 2) and average (column 3) length of the content uploaded, and the share of videos that have been created in high definition (column 4). We assume that the higher the number of videos and both their total and average duration, the higher the effort exerted by the creator on the digital platform. Also, the higher the share of videos uploaded in high definition the higher the effort of the creator who either, after shooting a video, has improved its quality to offer a better product to his/her audience, or has invested more in the equipment for shooting the videos.

Our data show that, overall, female creators exert significantly more effort in the digital platform in terms of the quantity (number and length) of the content posted. However, they devote significantly less effort as regards the quality dimension because they are significantly less likely to upload videos in high definition.

When digging deeper by separating the channels by thematic area, we see important heterogeneity in gender differences across the topics considered. Females upload a significantly higher number of videos than males when their channels belong to the topics *Food*, *Hobby*, and *Beauty*. On the contrary, the number of videos contributed by female creators is significantly lower in the thematic areas *Fitness* and *Knowledge* while no differences emerge in *Tech* (column 1).

In the thematic area *Fitness*, even if females contribute with a lower number of videos, such content is significantly longer (both in total and on average) than the content posted by male creators (columns 2 and 3). Instead, when considering channels belonging to the thematic area *Knowledge*, females not only contribute with a lower number of videos but also have both the total and the average duration of the content posted significantly shorter than male creators. As regards *Hobby* and *Beauty* both the average and total length of the videos are higher for female creators. In the topic, *Food* females' videos are on average longer but the total amount of hours of videos present on the platform is not significantly different by creator's gender. No gender differences in the total and average duration emerge for the thematic area *Tech*.

Finally, in column (5), we see that overall there are no gender differences in the effort exerted in the one-month period considered. However, when disaggregating the data by thematic area, we find that in the thematic areas *Fitness* and *Knowledge* female creators have been significantly less active on the platform in the one-month period considered.

	Videos	*Tot video hours*	*Avg duration mins*	*Share Video HD*	*Delta videos*
	(1)	(2)	(3)	(4)	(5)
Sample	Coefficient of *Female* (s.e.)				
All	9.26**	4.30***	1.84***	-0.03***	-0.06
	(3.91)	(1.39)	(0.17)	(0.00)	(0.25)
Fitness	-22.59***	6.92***	6.61***	-0.03***	-1.03***
	(5.66)	(2.15)	(0.41)	(0.01)	(0.27)
Food	32.54***	2.59	0.37*	-0.02**	0.94
	(8.24)	(3.16)	(0.19)	(0.01)	(0.73)
Hobby	51.05***	16.48***	2.06***	-0.05***	0.07
	(9.38)	(3.56)	(0.37)	(0.01)	(0.53)
Beauty	28.86*	9.54***	3.16***	0.00	5.69
	(15.93)	(3.10)	(0.94)	(0.04)	(5.90)
Tech	22.41	6.59	-0.46	-0.04***	0.55
	(18.23)	(4.77)	(0.67)	(0.01)	(0.54)
Knowledge	-68.25***	-17.99***	-1.52***	-0.01	-1.34***
	(7.48)	(2.45)	(0.43)	(0.01)	(0.36)

Note: The table reports the coefficient of the variable *Female* and its standard error (reported in parentheses and corrected for heteroscedasticity) for a regression having as dependent variable the variable indicated in column and estimated in the sample indicated in row. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. The control variables included in the regressions are: *Date channel creation*, *Time to first video* and *Years first to last video*. In the estimates conducted in the full sample, we also add dummies for the thematic area of the channel.

Table 2: **Gender differences in Effort. OLS estimates**

In Table 3, we study gender differences in the ability to reach a numerous and loyal audience assuming that the higher the value of the dependent variables is (*Views*, *Avg Views*, *Views per sec*, *Subscribers*), the higher the return of the effort exerted on the digital platform is.

When looking at the aggregate data we see that there are no gender differences in the number of (total and mean) views and subscribers to the channel. A statistically significant difference emerges for *Views per sec*: for each second of content uploaded, female creators attract on average about 56 views less than their male counterparts. Also, the loyalty to female channels seems less strong because in the one-month period considered the change in the number of subscribers was about 47 people lower for female than male

creators.

When splitting the sample by thematic area of the channel we see that the aggregate result is mostly driven by channels belonging to the thematic area *Food* and partly driven also by channels dealing with *Tech*. On the other hand, for female creators, the topic *Beauty* has registered a significantly bigger variation in the number of subscribers in the one-month period considered. No gender difference emerges for the remaining thematic areas.

The results obtained so far suggest that, despite exerting more effort in terms of the quantity of content uploaded, female creators do not obtain higher returns in the digital market, they are actually less able to attract views and subscribers. Thus, the higher engagement in content production and sharing of females does not translate into a significantly higher audience reach.

	Views	*Avg views*	*Views per sec*	*Subscribers*	*Delta views*	*Delta subscribers*
	(1)	(2)	(3)	(4)	(5)	(6)
Sample	Coefficient of *Female* (s.e.)					
All	-22300.61	-1749.84	-55.92*	760.48	5734.74	-47.21**
	(334027.65)	(2092.78)	(32.66)	(892.44)	(23714.65)	(19.54)
Fitness	27461.88	-771.93	6.13	60.10	-9162.38	8.72
	(246645.55)	(788.56)	(49.28)	(635.06)	(14134.91)	(18.52)
Food	-2529917.81***	-7098.87**	-227.87*	-4431.60**	-8437.66	-171.70***
	(930870.92)	(3007.48)	(120.20)	(2198.65)	(91661.40)	(59.04)
Hobby	172569.92	5870.32	10.51	3134.94	-9492.06	-14.57
	(768525.97)	(5338.46)	(38.20)	(2148.04)	(21227.77)	(39.68)
Beauty	-880448.05	-3648.67	-1.17	-8469.78	887952.12	17.03*
	(940314.23)	(3199.04)	(10.00)	(8919.80)	(864837.72)	(10.30)
Tech	1383558.90	-361.68	-21.23*	2474.16	-12670.18	-55.33***
	(1604576.72)	(1110.54)	(11.23)	(3929.46)	(15567.51)	(19.27)
Knowledge	53449.66	-6363.30	-20.31	-265.18	1432.11	-21.44
	(138444.18)	(6486.15)	(16.95)	(781.82)	(4788.48)	(42.21)

Note: The table reports the coefficient of the variable *Female* and its standard error (reported in parentheses and corrected for heteroscedasticity) for a regression having as dependent variable the variable indicated in column and estimated in the sample indicated in row. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. The control variables included in the regressions are: *Date channel creation*, *Time to first video*, *Years first to last video* and *Videos*. In the estimates conducted in the full sample, we also add dummies for the thematic area of the channel.

Table 3: **Gender differences in Audience. OLS estimates**

In Table 4 we take one step further and study gender differences in the ability to satisfy the audience's preferences thus stimulating its engagement and gaining its appreciation. By exploiting the metrics collected from the web regarding *Likes* and *Comments* received by the audience, we create several indicators of the feedback received from the audience. In the first three columns we consider as dependent variables, respectively, the average of the number of likes received for each video (*Avg Like*), the average number of likes received for each second of shared content (*Like per sec*) and the average number of likes received for each view of the content shared on the platform (*Like per view*). The greater the value of the three indicators, the greater the appreciation received by the audience. In columns (4) to (6) we compute

similar indicators for the comments: *Avg Comments*, *Comments per sec*, and *Comments per view*. The analysis of the positive or negative valence of the comment is beyond the scope of this paper. In both cases, we consider a higher value of these three variables as an indicator of higher audience engagement. Finally, in column (7) we use as dependent variable *Neg feedback*, assuming that the higher the share of videos having more comments than likes is, the higher the dislike expressed by the audience is.

Our data show important gender differences also along the audience appreciation dimension. Estimates from the aggregate sample show evidence of lower appreciation for females: the content shared by females receives on average about 86 likes less than the content shared by male creators and for each second of shared content females receive on average about 2 likes less than their male counterpart. As regards audience engagement, while it is significantly lower for female creators in relation to seconds of shared content (column 5), when considering *Comments per view* females are significantly more likely to stimulate engagement than males. Finally, female creators receive significantly more negative feedback than males.

When looking at disaggregated data we find that female channels receiving significantly less likes on average belong to the thematic areas *Fitness* and *Food*. In these topics, females obtain also a significantly lower level of *Avg comments* and *Comments per sec*. On the other hand, female creators receive significantly more *Like per view* and *Comment per view* than males when their channel belongs to the thematic areas *Hobby* and *Beauty*.

Finally, we see that gender differences in audience's dislike are heterogeneous by thematic area: *Neg feedback* is significantly higher for female than male channels belonging to the thematic areas *Food*, *Hobby* and *Beauty* while the opposite happens for the thematic areas *Fitness* and *Knowledge*. No difference emerges for channels dealing with *Tech*.

All in all, our results show that female creators produce a higher amount of content but with a lower quality. Their effort does not translate into higher returns, because they receive significantly fewer views for each second of shared content and obtain on average the same subscribers, nor into higher audience appreciation and engagement.[18]

[18]Our results are robust if we restrict the sample to channels with thumbnails representing a clear face of the creator, even if stylized (channels classified as *Neat*; see footnote 6). Only a very few coefficients are estimated less precisely, possibly due to the smaller sample size.

	Avg like	*Like per sec*	*Like per view*	*Avg comments*	*Comments per sec*	*Comments per view*	*Neg feedback*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample	Coefficient of *Female* (s.e.)						
All	-86.29***	-1.71***	0.00	-1.39	-0.00***	0.00***	0.01***
	(27.67)	(0.58)	(0.00)	(1.00)	(0.00)	(0.00)	(0.00)
Fitness	-66.42***	-0.59	-0.00***	-2.90***	-0.00*	-0.00**	-0.01***
	(25.58)	(1.33)	(0.00)	(0.56)	(0.00)	(0.00)	(0.00)
Food	-269.70***	-5.46***	0.00	-2.51*	-0.00***	0.01***	0.03***
	(72.07)	(1.64)	(0.00)	(1.45)	(0.00)	(0.00)	(0.00)
Hobby	-3.44	-0.91	0.01***	1.04	-0.00	0.00***	0.01**
	(64.62)	(1.31)	(0.00)	(1.44)	(0.00)	(0.00)	(0.00)
Beauty	-48.96	0.56**	0.02***	-0.49	0.00	0.02***	0.07***
	(82.50)	(0.26)	(0.01)	(5.83)	(0.00)	(0.00)	(0.02)
Tech	8.59	-0.73	0.00	-0.93	0.00	-0.00	0.01
	(57.41)	(0.51)	(0.00)	(3.03)	(0.00)	(0.00)	(0.01)
Knowledge	-66.17	-0.30	-0.00	-3.85	-0.00	-0.00**	-0.01**
	(58.14)	(0.28)	(0.00)	(3.61)	(0.00)	(0.00)	(0.00)

Note: The table reports the coefficient of the variable *Female* and its standard error (reported in parentheses and corrected for heteroscedasticity) for a regression having as dependent variable the variable indicated in column and estimated in the sample indicated in row. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. The control variables included in the regressions are: *Date channel creation*, *Time to first video*, *Years first to last video* and *Videos*. In the estimates conducted in the full sample, we also add dummies for the thematic area of the channel.

Table 4: **Gender differences in Feedback. OLS estimates**

5. Possible mechanisms

As our analysis shows, despite the distinct features of digital markets — such as low entry barriers and greater flexibility compared to traditional labor markets — significant gender disparities persist. A series of interconnected mechanisms can explain these differences.

Our first important finding is the late entry of women content creators into the market compared to men. In other words, women tend to exploit new platform technologies as a form of work at a more advanced stage. A possible explanation for this behavior lies in the well-documented gap in STEM (Science, Technology, Engineering, and Mathematics) fields and ICT (Information and Communication Technologies) (Bustelo et al., 2019; Beede et al.,

2011; Olivetti and Petrongolo, 2016; Reilly et al., 2019). Even in highly developed countries, where the trend is improving, low female enrollment rates in STEM fields prevent women from fully exploiting the opportunities offered by digitalization (Krieger-Boden and Sorgner, 2018).[19] Lower skill levels in STEM and ICT may be also partially responsible for the thematic segregation we observe in this market, with women predominantly focusing on areas such as physical attractiveness and food, and men dominating more technical content. Lower technology-related knowledge might discourage women from becoming content creators whose main topics involve discussing and influencing digital or technology-related subjects. Pattier (2021) highlights that female creators in educational content struggle to gain visibility and influence compared to their male counterparts, with men dominating subjects like science and technology.

Flexibility in work time, location, and conditions — allowing for a balance between family and work, which is assumed to be particularly important for women, especially mothers — makes content creation similar to self-employment.[20] According to the recession-push theory, poor or wors-

[19]The Graduate Profile Survey (AlmaLaurea, 2024) highlights that among STEM graduates, the male component is higher, accounting for 59.0%, compared to 41.0% for females, particularly in the fields of Computer Science and ICT technologies, as well as Industrial and Information Engineering, where men comprise more than two-thirds. Despite being fewer in number, women outperform men academically, achieving a higher average graduation grade (104.7 out of 110 compared to 102.8 for men) and better on-time graduation rates (58.6% for women versus 54.2% for men).

[20]The two forms of labor market activity differ because content creation requires neither human nor financial capital. It is not a substitute for either self-employment or salaried employment, as it can be pursued alongside a primary job as a side activity. Additionally,

ening prospects in wage employment drive workers toward self-employment (Taylor, 1996; Martinez-Granado, 2002). Furthermore, research on the topic highlights that women primarily enter self-employment from inactivity or unemployment "when nothing else is available" (Dennis and William, 1996) and often return to inactivity after disappointing experiences working on their own account. This behavior might be further exacerbated in the content creation market, due to the absence of educational and professional requirements and capital input, and may explain the two peaks in new female content creation channels, one in 2012-2014 and another in 2020. ISTAT[21] data on the female unemployment rate in Italy for the 15–64 age group show an increase from 9.7% in 2011 to 12.1%, 13.3%, and 14% in the following three years, before declining to 12.9% in 2015. Regarding 2020, data on the Italian labor market reveal that the percentage of women who lost their jobs that year was twice as high as that of men. The most challenging period for female employment was during the first lockdown, and the gender employment gap that emerged during this time was neither closed nor reduced in the following months.[22]

Due to its resemblance to self-employment, entry and success in the digital economy might also be influenced by entrepreneurial talent. Thus, gender imbalances in entrepreneurial skills may be another mechanism explaining

it is sometimes a leisure pursuit that may evolve into a highly profitable hobby.

[21]Italian National Institute of Statistics (ISTAT), https://www.istat.it

[22]https://www.istat.it/it/files//2021/02/Il-Mercato-del-lavoro-2020-1.pdf

our evidence of late entry and lower success for women in the digital market. Women in entrepreneurship face many of the same challenges as women in STEM since both fields are male-dominated, competitive, and demanding (Elliott et al., 2020; Chowdhury and Endres, 2005). Weaker entrepreneurial skills may hinder women's ability to launch digital careers, compared to men, and impact their ability to effectively promote their channels, limiting both their audience reach and subsequent success. Moreover, a different endowment of entrepreneurial talent may explain our finding that, over time, despite a similar or even higher share of new channels created by females, active channels remain predominantly male. Using Italian data, Rosti and Chelli (2005) demonstrate that while many women enter self-employment, they exit so quickly that traditional annual stock data (time series) fail to capture the phenomenon. This aligns with economic theories on discrimination, which suggest that employer bias may push more women toward other types of employment. Discriminatory practices suppress women's wages in dependent employment, thereby lowering the opportunity cost of starting other types of employment. As a result, even less skilled women may turn to content creation in response to workplace discrimination, yet their lower entrepreneurial ability increases their risk of failure, making them less likely to stay active compared to men.

Of particular importance, especially in the digital age where successful people can effectively share their careers, is the possible lack of female role models. Successful entrepreneurs, in all sectors, are often inspired by other

entrepreneurs and their paths to success. Not only there is a lack of role models for female content creators, but also their presence is strongly stereotyped: the few globally renowned women present on the digital market often focus on thematic areas generally associated with women (i.e. beauty), leaving a void for the new generations of female content creators who aspire to careers in male-dominated areas.

Beside the overall gender imbalance and thematic segregation in the content creator economy, the role model mechanism can explain also other evidence resulting from the data. For example, the notable rise of female channels beginning around 2012 can be possibly driven by the rise of one of the most famous female Italian influencers, Chiara Ferragni, who in 2010 was considered one of the biggest breakout street-style stars of the year by the American journal *New York* and, in 2011, was crowned as *Blogger of the Moment* by the magazine *Vogue*[23]. In addition, in section 4.2 we have shown that the share of active channels opened by female creators in the thematic area *Food* increased overtime and, starting from 2014, it slightly surpassed those of male creators settling between 50 and 60%. Despite this and gender norms traditionally designating the role of *breadwinners* — those responsible for the financial needs of the family — to men, and the role of *homemakers*

[23] https://www.thecut.com/2011/03/slideshow_the_week_in_street_s_16.html. It is worth noting that Chiara Ferragni has reached a large audience primarily through the Instagram platform and only partially through YouTube. However, her influence as a social phenomenon and her success in shaping a new type of digital entrepreneurship have likely inspired many fans to pursue similar careers across various platforms.

— those with the main responsibility for domestic chores — to women, we see that the audience prefers significantly more male creators when browsing *Food* related content. This might be because in the entertainment world, the role of *chef* in Italy is more associated with the male gender. For example, across all seasons of the well-known culinary talent show *Masterchef Italia*, the hosts have been predominantly male, with only one season featuring a female co-host alongside three male co-hosts. Furthermore, looking at the schedule of the *Food Network Italia* channel, which is part of the *Warner Bros. Discovery* network and entirely dedicated to cooking, we notice that 54 of the 106 television programs are hosted by men, 38 by women, and 14 feature co-hosts.[24]

The existence of gender stereotypes in social norms rooted in individuals is another possible mechanism explaining our findings of lower presence of female creators who concentrate and are successful mostly in thematic areas generally associated with that particular gender. In other words, biased expectations lead audiences to favor content that aligns with traditional gender roles, and the anticipation of these preferences (reflected in existing creators' success) leads creators to position themselves in areas that meet these expectations. This polarization reinforces thematic segregation and affects creators' ultimate success by influencing audience engagement and monetization opportunities.[25]

[24]Data retrieved on 11-12-2024 from *FoodNetwork.it*.

[25]Exley and Kessler (2022) highlight that women's reluctance to self-promote stems

Another important mechanism that could help explain the gender differences found in the content creator market is the response to feedback. Women's greater aversion to negative feedback might influence both their decision to enter and their persistence in the digital market. For example, Buser and Yuan (2019) find that women are more likely than men to stop competing after a loss, whereas men are more likely to start and continue competing after receiving positive feedback. This different sensitivity may deter women from starting channels due to anticipatory concerns about audience reactions, and it could also explain their shorter careers on the platform.[26]

6. Concluding Remarks

The digital revolution has given rise to the content creator economy, a growing market in which individuals use digital platforms to leverage their communication skills, personality, and creativity to attract audiences and create profitable careers. Unlike traditional labor markets, the creator economy is global and largely barrier-free, allowing anyone with Internet access to participate. Existing research primarily examines the interaction between creators and advertisers, focusing on how creators monetize their influence

from social and cultural norms discouraging assertiveness, especially in male-dominated fields. Yet self-promotion is essential for visibility, audience growth, and ultimately monetization. Further research using the tools of experimental economics could provide deeper insights into how these social norms affect audience preferences.

[26]To analyze this aspect properly, one would need to track content creators and their reactions to negative feedback. Further research using more detailed data might be able to study the role of feedback on creators' strategies.

through partnerships that enhance brand visibility. However, these studies often overlook the fundamental stages of content creation and audience dynamics that precede advertising opportunities.

Our research addresses this gap by examining the digital economy through the lens of gender differences. Specifically, we offer an in-depth analysis of gender differences in the content creator economy, focusing on the Italian YouTube market from 2006 to 2023. Our findings reveal significant disparities in access, engagement, and outcomes between male and female content creators. By analyzing over 18,000 Italian-based YouTube channels, we demonstrate that male creators were the early adopters of the platform for the Italian market, establishing dominance from its inception. Female creators began to participate more actively only after 2011, perhaps driven by the rise of several well-known female influencers, with a significant surge in channel creation during the COVID-19 pandemic in 2020.

A key finding of our study is the existence of gender segregation across thematic areas, mirroring patterns observed in the traditional labor market. Female creators tend to dominate thematic areas such as *Beauty* (97.2% of creators) and *Food* (56% of creators), while males prevail in areas like *Technology* (86.8%) and *Knowledge* (74.1%). These findings suggest that cultural norms and perceived gender roles may influence content creation decisions, even in the seemingly egalitarian digital space. Finally, while gender representation is more balanced in *Fitness* and *Hobby*, male creators still constitute the majority.

Our analysis further reveals that female content creators remain active on the platform for shorter periods than their male counterparts. Moreover, although female creators, on average, produce a higher quantity of content, they receive lower levels of audience engagement and appreciation.

We suggest several interconnected mechanisms that could explain gender disparities in the content creation market. One key factor is the technology skills gap. Women's lower representation in STEM and ICT fields often leads to delayed entry into the digital industry and a preference for less technical content. Additionally, women may be more inclined to pursue content creation during economic downturns, perceiving it as a flexible self-employment opportunity that provides control over work schedule, location, workload, and variety. However, content creation presents challenges similar to those in traditional entrepreneurship, suggesting that success in this market may require entrepreneurial skills. Thus, the lower participation and success rates of women in this field may be linked to disparities in entrepreneurial skills and experience.

Another potential mechanism is the scarcity of female role models. Successful female creators are relatively rare and tend to be concentrated in traditionally feminine fields, such as beauty, which may limit the ambition of aspiring female creators. Furthermore, gender stereotypes and social norms influence both content production and audience preferences, often favoring content that aligns with traditional gender roles while disadvantaging women in male-dominated sectors. Finally, gender differences in sensitivity to nega-

tive feedback may also play a role. Women tend to exhibit a greater aversion to criticism than men, which may discourage them from entering or persisting in the digital content creation space.

In conclusion, while the content creator market offers significant opportunities for all actors, our findings indicate that gender disparities persist. Addressing these imbalances will be critical to ensuring that digital platforms can provide equitable opportunities for creators of all genders.

Our study focuses on the Italian market, which has unique cultural, social, and economic characteristics that may influence the behaviors of content creators and their audience in ways that differ from other countries. It may be interesting to investigate what happens in countries with different gender norms and characteristics of the labor market. Also, our study covers only a specific subset of the content creators present on the YouTube platform, those belonging to thematic areas that mostly feature content inspired by personal creativity, expertise, and unique expression. Comparing our findings with those from other thematic areas may provide insights into gendered behavior when originality is less critical to success.

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Appendix A

YouTube Platform

The content creator economy is broadly defined as a collection of individuals who monetize their talents by generating and posting digital content on online platforms. This economy has experienced rapid growth, with an estimated global worth exceeding $100 billion (Peres et al., 2024). Content creators produce a wide array of digital content, ranging from videos and blogs to music and animations, across platforms such as YouTube, Instagram, and TikTok. These digital platforms have become central organizing infrastructures in many different domains of public and private life, transforming these domains in often significant ways (van Dijck, 2020).

Launched in 2005, YouTube quickly evolved from a repository of amateur videos to a robust media platform that catalyzes the intersection between social media entertainment and content creation. Its acquisition by Google in 2006 for $1.65 billion further propelled YouTube's growth, enabling it to integrate sophisticated advertising models and scale its services globally. This transformation, together with a constant update of the platform's features aimed at enhancing content delivery, viewer engagement, and creator monetization, was instrumental in creating an environment where digital creativity could flourish, allowing many to transition from hobbyists to professional content creators.

Because of its pioneer role in the digital industry, YouTube rapidly became one of the most significant communication platforms worldwide. In-

deed, it is the second most visited website in the world, only after Google search (Similarweb, October 2024)[27]. Users spend an average of 20 minutes per visit, the highest among the top 20 websites globally.

YouTube's evolution has been marked by constant innovation, with the platform introducing features like HD video (December 2008), live streaming (May 2013)[28], and YouTube Kids (2015), catering to a growing and diverse audience and enabling creators to refine their content and grow their subscriber bases effectively.

YouTube operates within a broader ecosystem of social media, with its content frequently shared on platforms like Facebook, Instagram, and Twitter (recently renamed X). This interconnected nature enhances content virality and community growth, extending the reach of creators beyond YouTube itself and, in turn, significantly contributing to their visibility and success.

One of the critical aspects of YouTube has been its evolving approach to monetization. Initially, since the introduction of the YouTube Partner Program (YPP) in 2007, the monetization on the platform was relatively straightforward, involving ad revenue sharing with creators. Over the years, YouTube has introduced several monetization methods, including channel memberships, super chats during live streams, and exclusive content through YouTube Premium. These avenues provide creators with multiple streams of income, crucial for sustaining their digital careers. Nevertheless, the plat-

[27]https://www.similarweb.com/top-websites/
[28]Initially opened only to verified users with at least 1,000 subscribers.

form's policies on monetization and demonetization have also seen significant shifts, often in response to broader social and economic factors. These changes can affect creators dramatically, both positively, i.e. by opening new revenue paths, and negatively, i.e. by restricting monetization on certain types of content due to advertiser preferences or platform policy updates.

In 2018, YouTube raised the eligibility threshold for YPP, requiring creators to have at least 1,000 subscribers and 4,000 public watch hours over the past 12 months to access monetization. This move was designed to improve platform integrity but was controversial as it raised barriers to entry for smaller and emerging creators.

Further evolutions came in 2020 with the rise of competitors like TikTok, prompting YouTube to launch YouTube Shorts, its own short-form video feature. In line with this, YouTube adjusted its monetization eligibility, requiring 10 million valid public Shorts views in 90 days for creators to monetize short videos. This was seen as a competitive move to capture the growing short-video market.

During the COVID-19 pandemic, YouTube usage surged, accounting for 15% of all internet traffic. In response, the platform expanded live streaming tools and introduced more robust monetization features like Super Chat[29] and Channel Memberships[30], allowing creators to sustain engagement with

[29]Users can purchase Super Chats that allow them to highlight their messages during live chat sessions.

[30]Channel Memberships allow creators to offer exclusive perks, such as custom badges and emojis to access to members-only content or live chats, in exchange for a monthly fee.

their audience during the global lock-downs.

In mid-2023, YouTube lowered the monetization thresholds in several countries, including Italy, to 500 minimum subscribers and either 3,000 public watch hours or 3 million valid public Shorts views in the past 12 months. These reduced thresholds were introduced to provide more creators with opportunities to access monetization sooner, particularly in competitive or emerging markets.

In substance, with over 2.5 billion monthly users, YouTube has occupied a unique and dominant position in the content creator market, or more in general, in the video-sharing industry. While there are alternative platforms (e.g., Vimeo, Twitch, TikTok), none of them offers the same combination of features, reach, or monetization potential as YouTube.

Appendix B

Word Clouds

Below, we analyze the top words for each topic to capture the main themes:

Beauty: The most prominent words are "capelli" (hair), "trucco" (makeup), "makeup", "consigli" (advices) and "bellezza" (beauty). These terms are used by the content creators to emphasize the central focus on hair styling, makeup tutorials, and beauty tips (Fig. 13).

Figure 13: Wordcloud for topic Beauty

Fitness: Key words include "allenamento" (training), "fitness", "palestra" (gym), and "sport". Content creators using these words may indicate a focus on physical training, fitness routines, and gym workouts, suggesting content aimed at promoting an active and healthy lifestyle (Fig. 14).

Figure 14: Wordcloud for topic Fitness

Food: Dominant terms are "ricette" (recipes), "cucina" (cooking), and

"chef". The emphasis on recipes and cooking reflects the instructional nature of food preparation and culinary exploration, addressing to viewers interested in expanding their cooking skills (Fig. 15).

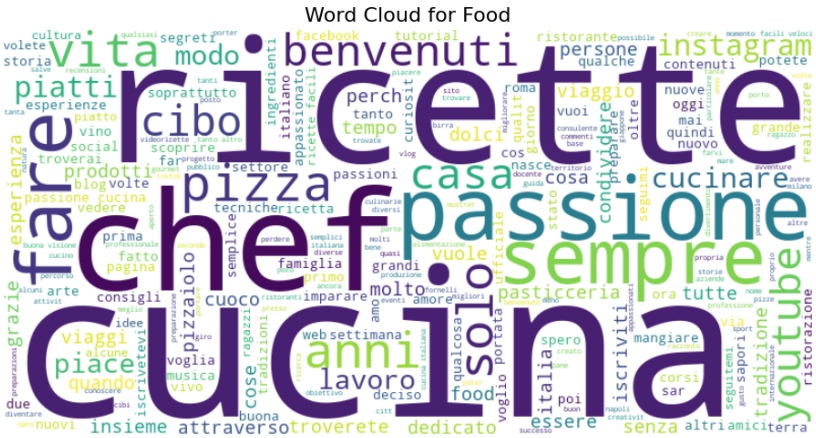

Figure 15: Wordcloud for topic Food

Hobby: Frequently words include "passione" (passion), "mare" (sea), "pesca" (fishing), and "vita" (life). These terms suggest content creators centered around personal hobbies and outdoor activities, with a strong focus on nature and fishing (Fig. 16).

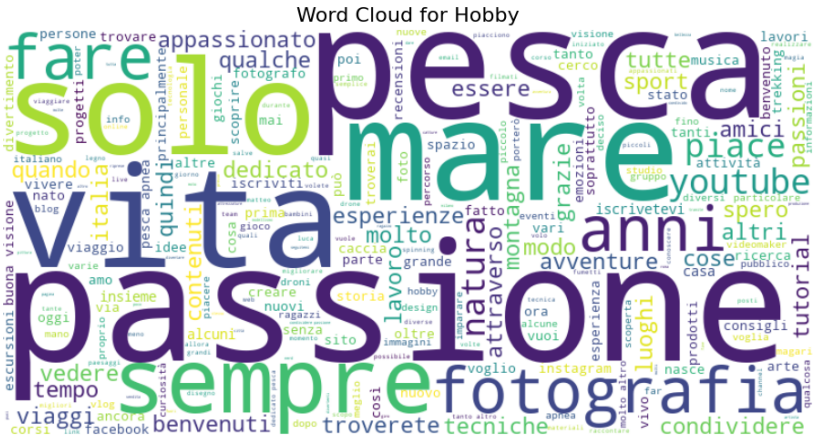

Figure 16: Wordcloud for topic Hobby

Technology: The most prominent words are "tutorial", "tecnologia" (technology), and "youtube". These terms might highlight an instructional and technical nature of the content, that could focus on technology reviews, tutorials, and content related to the platform itself (Fig. 17).

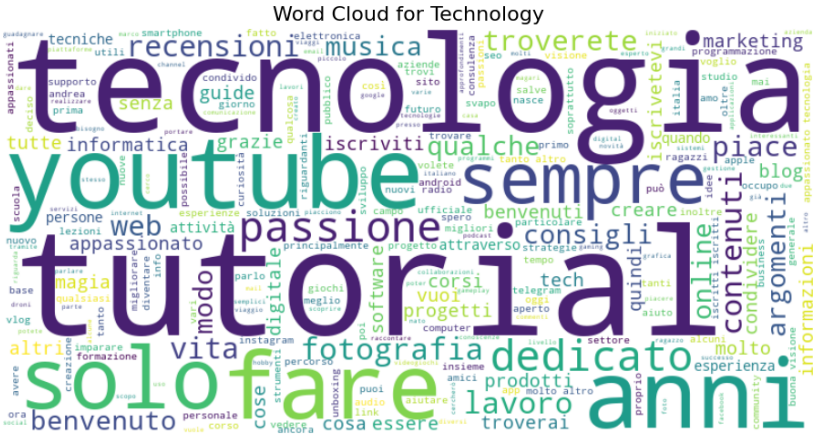

Figure 17: Wordcloud for topic Technology

Knowledge: Top words are "lavoro" (work), "vita" (life), and "studio"

(study). These keywords indicate a focus on professional and educational development, reflecting channels dedicated to knowledge dissemination (Fig. 18).

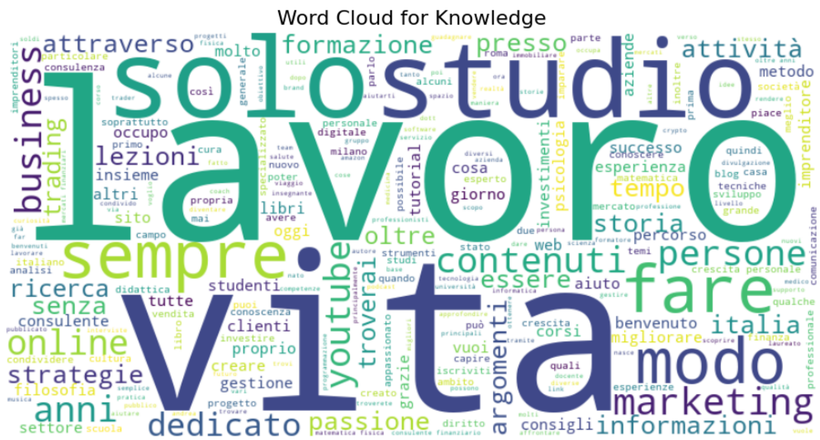

Figure 18: Wordcloud for topic Knowledge

AppendixC

Word Clouds by gender

Here is a general overview based on gender differences across categories:

Beauty: The focus of female creators leans heavily on words like "makeup", beauty, and "prodotti" (products), indicating a strong emphasis on makeup tutorials and beauty products. On the other hand, for male creators, while "trucco" (makeup) and "makeup" still dominate, there is a notable focus on "capelli" (hair) and "consigli" (advices), suggesting a more diverse content mix, including hairstyling and general beauty tips (Fig. 19).

Figure 19: Wordclouds for Beauty by Gender

Fitness: For female creators, the most frequent terms include "yoga", "fitness", "allenamento" (training), and "corpo" (body), highlighting a focus on holistic fitness approaches that emphasize mind-body balance. In contrast, in the male creator channels, "allenamento" (training), "fitness", "sport", "palestra" (gym), and "esercizi" (exercises) are prominent, that could indicate a greater focus on physical fitness, bodybuilding, and athletic training (Fig. 20).

Figure 20: Wordclouds for Fitness by Gender

Food: Female creators predominantly use words such as "cucina" (cooking), "ricette" (recipes), "vita" (life), and "casa" (home) that point to content centered around home cooking, recipes, and family-oriented culinary experiences. Similarly, "cucina" (cooking) and "ricette" (recipes) dominate the male

channels, together with “chef”, that could suggest a professional or specialized angle of their channels, and “passione” (passion) to highlight the strong interest, attitude and enthusiasm they have for this topic (Fig. 21).

Figure 21: Wordclouds for Food by Gender

Hobby: Words like “tutorial”, “passione” (passion), “sempre” (always), and “anni” (years) are central in the description of female channels regarding hobbies, indicating a focus on creative tasks for which they have a lot of experience. Male creators, on the other hand, use words like “pesca” (fishing), “passione” (passion), “vita” (life), “mare” (sea), and “fotografia” (photography), highlighting outdoor and exploratory hobbies, that could often be related to nature and adventure (Fig. 22).

Figure 22: Wordclouds for Hobby by Gender

Technology: Dominant words like “tutorial”, “fare” (to do/make), "on-

line", and “digitale” (digital) suggest a focus of female channels on practical, instructional content related to digital tools, online platforms, and social media usage. Besides “tutorial” and “youtube”, male creators also use very often the word “tecnologia” (technology), possibly highlighting a focus on more technical expertise (Fig. 23).

Figure 23: Wordclouds for Technology by Gender

Knowledge: In the thematic area *Knowledge* both female and male content creators use very often the words “lavoro” (work) and “vita” (life). Females also often refer to “online” while males emphasize also “studio” (study), possibly highlithing content focused more on education or professional skills (Fig. 24).

Figure 24: Wordclouds for Knowledge by Gender

Appendix D

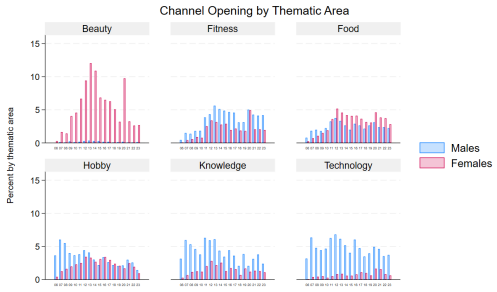

Figure 25: Gender distribution of new channels by thematic area

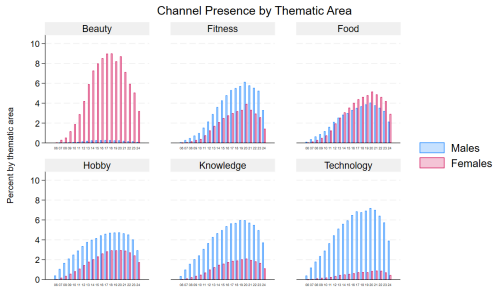

Figure 26: Gender distribution of active channels by thematic area