The gender gap on the Spanish *Wikipedia*: Listening to the voices of women editors

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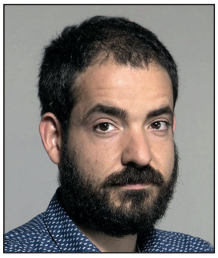

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Abstract

Wikipedia is one of the most widely used information sources in the world. Although one of the guiding pillars of this digital platform is ensuring access to the diversity of human knowledge from a neutral point of view, there is a clear and persistent gender bias in terms of content about or written by women. Through semi-structured interviews with current and former women editors, our research offers a closer look at the different factors that influence editing practices on the Spanish *Wikipedia*: the educational and social contexts that prompt women to start or stop editing; their perceptions of the treatment of gender equality in the encyclopedia; and their feelings about taking part in the creation of content in an environment where they find themselves in a minority. Self-organized events known as edit-a-thons (in Spanish, *Wikiquedadas*), where women meet to discuss and share editing practices, have emerged as self-inclusion strategies to enable more women to enter, remain, and be recognized in this male-dominated editing environment. Smaller *Wikipedia* communities are also perceived as more inclusive environments. Lack of digital competences or difficulty using the platform do not appear to be aspects that negatively influence the participation of women in the editing process, though time spent on unpaid care work does seem to be a critical factor.

Keywords

Wikipedia; Encyclopedias; Editors; Peer production; Participation; Open content; Open knowledge; Feminism; Gender bias; Digital inequality; Gender gap; Digital divide; Edit-a-thons.

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1. Introduction

Wikipedia is one of the most widely used information sources in the world and one of the ten most popular websites in Spain, according to *Alexa*.
https://www.alexa.com/topsites/countries/ES

It is also the most widely used website in the education sector, especially among students or where no books are available (**Aibar** *et al.*, 2015; **Konieczny**, 2016; **Selwyn**; **Gorard**, 2016; **Brailas** *et al.*, 2015). *Wikipedia* is a free encyclopedia, written collaboratively with the aim of becoming "the sum of all knowledge," as stated in *Wikipedia*'s vision. It was launched in 2001, and today contains more than 40 million articles in 301 languages. Due to its highly linked structure, *Wikipedia* usually ranks in the first page of query results on any search engine (**Singer** *et al*., 2017).

The Spanish *Wikipedia*, the focus of this paper, is the ninth largest *Wikipedia*, with more than 1,580,000 pages, and the fourth largest in terms of the number of registered editors (about 17,000).
https://en.wikipedia.org/wiki/List_of_Wikipedias

Most studies of *Wikipedia* have focused on its English version (**MacAulay**; **Visser**, 2016), although there are a few studies in other languages, such as German (**Sichler**; **Prommer**, 2014) or Greek (**Protonotarios**; **Sarimpei**; **Otterbacher**, 2016). A study of the Spanish *Wikipedia* is of particular interest because it is one of the biggest *wikipedias*, and because Spanish is a language that uses the grammatical gender, which is useful for identifying the gender of the editors (**Aikhenvald**, 2016). Moreover, the Spanish *Wikipedia* serves a diverse range of cultures (in both Europe and Latin America).

Wikipedia has transformed the way that information is produced and distributed, but questions have been raised about just how decentralized, flexible, and open that information is, given that it is generated within a pre-existing economic, social, and political model (**Hood**; **Littlejohn**, 2018). Although it aims to do so, *Wikipedia* does not yet sufficiently reflect the diversity of the world's cultures and knowledge, because certain cultural expressions are either not represented or only appear in a small number of languages (**Hecht**; **Gergle**, 2010; **Callahan**; **Herring**, 2011; **Miquel-Ribé**; **Laniado**, 2018). Moreover, it is well known that *Wikipedia* suffers from a severe and persistent gender bias (**Hinnosaar**, 2019; **Massa**; **Zelenkauskaite**, 2014; **Wagner** *et al.*, 2016), reflected both in the community involved in the editing process (the majority of editors are men) and in the content itself (biographies of men outnumber those of women and tend to be more extensive). The only aspect of *Wikipedia* that comes close to gender equality is its readership, which is made up of a roughly equal proportion of men and women (**Hill**; **Shaw**, 2013). Several authors have analyzed the gender gap on *Wikipedia*, in terms of either content or participation. Regarding the latter, **Glott**, **Schmidt**, and **Ghosh** gauged this gap in their analysis of the results of a survey about *Wikipedia* in 2010, finding that only 12.64% of *Wikipedia* contributors were female. **Lam** *et al.* (2011) examined this imbalance more closely; using a different approach, they found that females represented 16.1% of the editor profiles analyzed in their study but only accounted for 9.0% of edits made by that cohort of editors. In a previous study of our own, a massive content coding process revealed that women editors are a minority, making up only 11.3% of all Spanish *Wikipedia* editors analyzed (**Minguillón** *et al.*, 2021). The percentage is similar for the English *Wikipedia*; studies using survey methods have determined that women editors represent between 10% and 15% of the total, and in some cases even less (**Lam** *et al.*, 2011; **Antin** *et al.*, 2011). However, we found in quantitative research that among editors with a large number of edits over time, these differences were not statistically significant, or even reversed, as in some cases women outperform men. Engaging, participating, and persisting as an editor on *Wikipedia* is therefore a much more complex process for most women than for men.

On the Spanish *Wikipedia*, less than 20% of biographies are of women (*Wikimedia France*, 2020). Men and women also tend to focus on different subject areas, thus reinforcing the content imbalance between "male" and "female" topics. Furthermore, women editors are also subjected to more conflicts, such as reversion and blocking of their edits, than men (**Minguillón** *et al.*, 2021).

In 2011, the *Wikimedia Foundation* recognized gender inequality on the website and claimed to be working to resolve it (2011). Sue Gardner, the former executive director of the *Wikimedia Foundation*, cited various factors preventing women from becoming *Wikipedia* editors, such as problems with the interface, lack of time, lack of self-confidence, the platform's misogynistic atmosphere, and the absence of a culture of social interaction (2011). More recently, however, the *Wikipedia Foundation* has introduced a new strategic focus on knowledge equity and knowledge as a service in

which gender is not mentioned (2020). Given that *Wikipedia* is a widely used learning resource with a significant impact on education (**Soler-Adillon**; **Pavlovic**; **Freixa**, 2018; **Dawe**; **Robinson**, 2017), it is unacceptable that it should exclude women, who make up 50% of the world's population.

2. Theoretical framework

Information and communication technologies seem to have created a scenario where pluralism and new forms of expression are possible as never before, giving rise to a highly interconnected public sphere (**Clua**; **Ferran-Ferrer**; **Terren**, 2018; **Slevin**, 2000; **Castells**, 2008; **Van-Dijk**, 2012; **Benkler**, 2006). An important element in the contemporary public sphere is *Wikipedia*, which has the unique potential to facilitate a more equitable production of knowledge (**Hargettai**; **Shaw**, 2018) through commons-based peer production and the provision of a virtual forum for discussion.

The idea of equality as being inherent in the public sphere is questioned by some feminist authors, who point to a neglect of gender issues (**Guerra-Palmero**, 2019). The public sphere was defined by Jürgen Habermas as

> "the realm of our social life, in which something approaching public opinion can be formed" (**Habermas**; **Jürgen**; **Lennox**, 1974).

The public sphere must therefore permit the circulation of information for communicative interaction among individuals to develop a public consensus and facilitate decision making. For Habermas, the success of the public sphere is founded on a rational-critical discourse: everyone is an equal participant, and the supreme communication skill is the power of argument. Of course, the liberal ideology was founded on patriarchal principles that relegated women to the private sphere and to domestic matters. Therefore, to achieve real equality in the public sphere, a break with the epistemological and philosophical foundations of liberalism is needed (**Pateman**, 1988). The Habermasian conception of the public sphere sees deliberative processes as opportunities for consensus, but agonistic pluralism criticizes this perspective, pointing out that consensus can only be reached at the expense of the dissenters' voice. Mouffe argues that society is irreducibly pluralist and that the idea that all identities may deliberate on the basis of a shared communicative rationality is therefore implausible. Moreover, the idea that an unadulterated and unbiased ideal speech situation should serve as a model is unrealistic (**Mouffe**, 2000). Mouffe's main criticism of the Habermasian view is that Habermas understands a rational consensus specifically in liberal terms, and this excludes individuals and collectives that do not identify with these values.

The exclusion of individuals and collectives from the public sphere undermines the plurality of the human condition. For **Arendt** (1974), if someone is prevented from accessing the public space, they are deprived not only of seeing and hearing others but also of seeing and hearing themselves. The public sphere for Arendt is the place where plurality is expressed, referring to both equality and distinction. In the public arena, individuals are differentiated from each other and reality is the result of the intertwining of perspectives of all those who occupy different positions in that space. In this way, commonality is established while at the same time identities are distinguished and recognized.

Although the ideal solution might seem to be to expand the public sphere to include women, this does not receive support from feminist authors such as Landes and Young, who both argue that the public sphere is inherently gender biased. For these authors, the exclusion of women from the public sphere is not accidental, because universality is necessarily homogeneous in order to appeal to impartiality and thus becomes a way of silencing difference and plurality (**Young**, 1989; **Landes**, 1992). In this sense, **Benhabib** (1992) suggest that it is only possible to include women in the public sphere if they enter the universal dialogue with full rights and their specificity as women is recognized. In opposition to the Habermasian universal communication community, Benhabib posits the need and solidarity community, taking into account the need for equality but also differentiation. This means that the public sphere needs to be feminized. From the point of view of the feminist criticism, women do not identify themselves with the cultural patterns that respond to the male experience of the world, nor are they comfortable with the exclusive dedication demanded by the public time and space on the understanding that somebody else will take care of the demands of the home (**Dean**, 2007).

However, the possibility of commons-based peer production facilitated by digital media has introduced some unprecedented benefits that require consideration, in relation to both the structure of the public sphere and new forms of organization within it. With this in mind, the aim of this paper is to determine whether women are effectively capable of accessing and editing (and transforming) *Wikipedia*.

In semi-structured interviews, women editors of the Spanish *Wikipedia* explained what motivated them to work on this male-dominated platform, what prompted former editors to stop working on it, and other aspects detailed in the methodology section below.

Specifically, the purpose of this study was to answer the following research questions:

- What are the social, demographic and ICT training contexts of women editors?
- What motivates women to participate in the *Wikipedia* editing process, and what motivates them to give it up?
- What are women editors' perceptions of gender equality on *Wikipedia* as a digital encyclopaedia?
- How do women editors feel about their experience of content creation in a culture marked by gender inequality?

3. Material and methods

This research study uses a qualitative methodology based on interviews conducted with key informants (**King**; **Horrocks**; **Brooks**, 2018; **Kvale**; **Brinkmann**, 2009). We drew on previous work carried out in the context of the research project to prepare the interview format (**Minguillón** *et al.*, 2021). The population of editors on *Wikipedia* in Spanish was defined as the group of registered users who had at least 50 edits, were active during the last five years and had a user page. This data was obtained from a *Wikipedia* data dump on 1 October 2017, following **Lam** *et al.* (2011). This generated a group of 13,210 editor candidates for encoding. We then carried out stratified sampling, taking into account the number of edits and the size of (i.e., amount of information available on) their user page, to ensure a statistically representative cross-section of the diversity of Spanish *Wikipedia* users. This procedure enabled us to obtain a sample of 4,746 editors, with a maximum error margin of ±1.14% for a confidence level of 95%, under the assumption of maximum indeterminacy (p=q=0.5 and k=2).

We then performed encoding for the purpose of identifying the gender of the users, on the basis of the information provided on their user pages. To do this, we used an instrument that enabled us to determine gender based on the information given on the user's personal page, according to the following criteria:

- users who explicitly refer to themselves as either male or female, whether in their description or by the use of an infobox;
- users who do not explicitly indicate gender, but provide a real name that clearly indicates gender;
- users who neither explicitly indicate gender nor give their real name, but gender can be deduced from the grammatical gender of expressions used to describe themselves.

This instrument enabled us to classify users as male, female or, where none of the established criteria could be applied, of unknown gender. This is the binary classification also used by the Spanish *Wikipedia*, where users can choose their gender to be identified as *Usuario* (male), *Usuaria* (female) or unspecified (unknown). Other digital platforms, such as *Facebook*, allow users to choose from 71 different options of gender identities (**Williams**, 2014), but in the Spanish *Wikipedia* there are only two identities and unspecified. The instrument was tested by two independent encoders on a random sample of 100 profiles to analyze inter-rater reliability (**Neuendorf**, 2011) and demonstrated a satisfactory level of agreement, obtaining a **Krippendorff**'s alpha of 0.9635 (1990).

Disregarding profiles that were unavailable at the time of encoding (i.e., pages with no content, and blocked or deleted users), we were able to determine the gender of a total of 4,746 editors. Of these, 353 were classified as female, representing 7.4% of the total number of profiles and 11.2% of gender-identified users (i.e., excluding unknown-gender users), figures similar to those indicated by other authors (**Lam** *et al.*, 2011). We then classified the 353 women editors into four groups (Table 1), according to their level of participation in the *Wikipedia* editing process. Group 1 was made up of women who were still editing *Wikipedia* (108), while Groups 2 to 4 included former women editors who had not edited for six months or more (246).

Table 1. Grouping of women editors on *Wikipedia* and number of interviews conducted

Group	Profile	Description	N. women editors	N. interviews conducted
1	Current editors	Women still editing	108	4
2	Former short-term editors	Women who edited for a maximum of three months	73	2
3	Former mid-term editors	Women who edited for more than three months and less than one year	41	2
4	Long-term former editors	Women who edited for one year or more	132	4

Working from the gender-identified profiles, the interviews were announced on *Wikipedia* user pages, and users were invited to take part in the study via the discussion pages or by email (in cases where the user page provided an email address), in accordance with the mechanisms offered and rules of use established by *Wikipedia*. Email is disabled unless the user specifies a verified email address, as *Wikipedia* is designed to operate based on public dialog, which makes recruiting on the platform difficult. However, when possible, an email address search was performed on other social media platforms such as LinkedIn. In the end, over a period of one month, affirmative replies were obtained from a total of 12 out of the 142 women contacted randomly across the four groups.

The interviews were scheduled and an informed consent form was sent to the women editors taking part in the study in compliance with research ethics and confidentiality requirements, through a qualified and reputable service provider accredited by the Spanish *Ministry of Energy, Tourism and the Digital Agenda*. The participants' personal data was processed in accordance with legal stipulations at all times. The 40-to-60-minute interviews were conducted via *Skype* and recorded with *Call Recorder*. The interviews were conducted between October and November 2018 and transcribed in their entirety. Though the participants were rendered anonymous, they are identified in this article by their inclusion in group categories 1 to 4 (Table 1) and by a set of initials which only the researchers are able to associate with each interviewee.

The semi-structured interviews were based on a previously developed questionnaire with 33 questions divided into five blocks. The structure of the interview questionnaire is outlined in Table 2.

Table 2. Structure of the Interview questionnaire

Block A	Personal experience with *Wikipedia*
Block B	Reasons for giving it up (only applicable to editors in Groups 2, 3 and 4)
Block C	Context for participation and context for editing
Block D	*Wikipedia* and feminism
Block E	Socio-demographic data

The interviews were transcribed in full and then encoded (between December 2018 and February 2019) by two encoders, taking the five blocks presented above as analysis categories. A reliability test had previously been performed, with results above .80. The qualitative analysis conducted was thematic, which is a flexible method that supports the search for themes or patterns (**Gareth** *et al.*, 2017).

Considering that the qualitative study focuses, among other aspects, on practices related to the production of content (both creation and editing), we sought to identify what drove women to become editors as well as what caused them to give up the work. In this paper, therefore, we focus on editing practices in relation to socio-demographic context, formal education and ICT education or training, real-life experiences as women editors, feelings generated, and stance in relation to feminism and their condition as women.

4. Analysis and results

Results are presented here in relation to each of the study's stated objectives.

4.1. Description of the social, demographic and ICT training contexts of women editors

The participants were aged between 23 and 63 years of age and were of eight different nationalities, predominantly from Spanish-speaking countries in Europe and Latin America. The respondents were responsible for 50% or more of the household labor in their domestic situation, with proportions as high as 100% in some cases. Only two of the participants stated they did not spend time devoted to unpaid care work. All of the respondents worked outside the home and their working weeks ranged from 30 to 50 hours. With respect to formal education levels, two participants had only completed secondary school while the rest had all completed a university degree.

In terms of specific ICT-related competences for editing *Wikipedia*, all of the short-term editors (G2 and G3) began editing as part of a group, motivated by the prospect of participating in the *Wikipedia* project, and were supported by face-to-face events (edit-a-thons or *Wikiquedadas*) where they received technical training and met other women editors. All of the women involved in these events continued to work as editors while the project was ongoing but left *Wikipedia* as soon as the project or campaign ended. These events provided them with training but mostly with self-confidence when they continued editing on their own. But as soon as the group dissolved, short-term editors stopped editing *Wikipedia*. On the other hand, long-term editors were all self-taught and had also participated in events such as edit-a-thons, attended mainly by women to address *Wikipedia*'s gender gap (G4).

When women editors were asked directly whether they felt self-confident enough to edit, they stated that they were not afraid to make mistakes (G1-LF, G1-JC) and considered that learning to edit was technically very straightforward (G1-LF, G1-CA). One editor (G1-VC) who had been editing for two years editing still considered herself a "novice" and said she only used the platform's most basic tools. The same participant started out editing as part of a group and continued doing editing work after that support ceased to be available to her. She was the only one of the participants who continued editing without group support.

4.2. Motivation of women to participate in and give up editing on the Spanish *Wikipedia*

On one hand, the reasons for beginning work as an editor included the opportunity to take part in edit-a-thons (G1-VC), personal affinity and admiration for the values of *Wikipedia* (G1-LF), and an interest in tasks associated with editing, such as seeking out and sharing information (G1-JC). Former long-term editors were motivated to take up editing for a wide range of reasons. None did so because of a face-to-face event, although in one case it was through a *Wikiproject* (G4-NOR). All long-term editors are in favor of edit-a-thons and see their benefits "as an impulse to bring women into editing" (G4-AV). The main factor behind joining *Wikipedia* for long-term editors was associated with having free time (G4-CM, G4-AV), either due to having time off from work (G4-CM) or working a part-time job (G4-AV). One former editor was anxious about retiring and began working for *Wikipedia* so that she could continue doing editing work (G4-CM).

On the other hand, the main reason for giving up editing for *Wikipedia* was related to the perceived role of women within the family environment and the resulting lack of free time: "We have less time [...] Men have so much free time" (G1-CA). Conversely, one participant said she was able to edit because she could do it while doing other domestic duties: "I can edit as I can cook and edit at the same time; it's the only way" (G1-LF).

Women edit on fewer days than men, but when they find the time they do it more intensively, i.e., more edits per day. For instance, participant G1-VC said: "I do not have so much time, so I save one afternoon per month to edit." Another editor said she could not be that organized: "I edit intermittently, when I find a gap, mainly at Christmas and on holidays." She said she wished she could do more editing and when she finally finds time, "I do not have time for discussions; when I find time, I just edit" (G4-NOR). All respondents considered providing arguments and justifications about their edits to be a waste of time.

Another reason for leaving *Wikipedia* was the closure of the editing groups they started their training in (G2-NR, G2-YO), as highlighted above.

Nevertheless, respondents generally expressed great satisfaction with the editing experience, knowing they were taking part in a project with an objective as noble "as an open learning resource for everyone to use, mainly where books are not available" (G1-LF), contributing and sharing (G1-JC), improving information resources (G2-NR), etc. The experience, even for women who have given up editing for *Wikipedia*, was largely positive. Only one former editor (G4-AV) said she left because of a bad experience related to the undervaluation of women. The experience stemmed from a discussion when she had tried to defend her content against several male editors. In fact, most respondents acknowledged feeling insecure as members of a minority on *Wikipedia* (i.e., G2-NR, G2-YO, G3-IG, G4-AV, G4-NOR, G4-CM, G4-FP), and recognized the hostile environment as a significant issue (G1-LF, G1-JC, G1-CA). Following some bad experiences, one former editor (G4-NOR) left the Spanish *Wikipedia* for the Catalan *Wikipedia* because, she said, "it's smaller, everyone knows each other, they value your contributions positively and the environment isn't so rough."

4.3. Women editors' perceptions of gender equality on *Wikipedia*

We analyzed stances in relation to feminism, gender visibility in the "user" label (*Usuario* [male user] or *Usuaria* [female user] in Spanish) on the *Wikipedia* user profile, and the use (or non-use) of inclusive language.

With respect to the "*Usuario*/*Usuaria*" category offered by *Wikipedia* (**Ross** *et al.*, 2018), all respondents were in favor of being identified as female. Two were indifferent to the label (G4-CM and G3-IG), two objected to being referred to as "*Usuario*" (G2-NR and G1-CA), and three (G2-YO, G1-CA, and G4-AV) asserted that women should identify themselves using the feminine gender. A number of the women editors, however, were unaware that the platform facilitated this option (G3-NG, G4-FP, G4-CM).

In order to identify themselves, some of the editors and former editors used their own name or a female nickname that revealed their gender. The majority thought that being a woman did not detract from their credibility, though some respondents had not given the idea any thought prior to the interview (G2-NR and G4-CM). One (G4-FP) said that some users treated her as a man in the discussion rooms because of her nickname. On the other hand, one participant observed: "from my own life experiences, I am fairly sure that being a woman does affect my credibility in the eyes of other editors" (G4-NOR). In fact, a number of respondents identified different types of conflict situations that arose because they are women. One (G1-CA) respondent suggested that young men in particular fail to respect the opinions of others. This is corroborated by another (G3-NG), who commented that she encountered a hostile atmosphere in the discussion rooms simply because she was a woman.

Opinions were also expressed about the paternalistic attitude assumed by some male editors. According to G2-NR, some male editors "refuse to allow you to have difficult situations as a woman in *Wikipedia*: that's their role, to supervise and look after you."

Perceptions of gender equality are also influenced by the use of inclusive language. Women whose native language has grammatical gender, as Spanish does, need gender to be visible in the encyclopedia's content. All respondents agreed that the language used was sexist. G1-JC attributed the phenomenon to the scarcity of women editors. With respect to the masculine form being used to refer to both men and women, G1-VC commented that "the fact that this is considered neutral, to me, makes it sexist," although others considered the use of the male gender to be neutral (G2-JO and G3-IG). G4-CM did not consider use of the masculine in this way to be sexist and even added that "the terminology considered egalitarian or feminist these days really irritates me."

All of the current editors and one former editor interviewed reported correcting language they considered sexist and rendering it inclusive (G1-VC, G1-LF, G3-NG, and G4-NOR). G2-JO noted that if she had detected sexist language, she would also have done so: "The sexist point of view really annoys me; it affects everyone of my gender." G1-CA reported modifying the language she used to render it neutral; she preferred not to feminize language as a whole. G4-FP was the only respondent who did not think that sexist language was a feature of *Wikipedia* and was not an advocate of inclusive language.

All of the participants in the active editors group (G1) said they used inclusive language in their editing. G1-VC commented: "I concentrate on the woman as a person [...], I concentrate on her contributions." G1-LF said she used neutral language and was learning to use inclusive language; G1-JC complained that her text was changed when she used inclusive or neutral language. G1-CA came into conflict with other editors over trying to change the male gendered "El Día del Niño" (lit., "Boys' Day") to the neutral "El Día de la Niñez" ("Children's Day") and was unable to persuade them to agree to the change on the Discussion Page.

On the specific question of whether they considered themselves feminists, not all respondents replied in the affirmative, although, as noted above, all of them considered that *Wikipedia* uses sexist language and recognized the gender gap on the platform in terms of both biographies and editors. Only three of the participants considered themselves to be gender activists (G2-NR, G1-VC, and G1-JC), two considered themselves feminists (G3-IG and G4-NQR), and the rest did not define themselves as such.

4.4. Feelings related to the experience of content creation in a culture marked by gender inequality

The editing experience was generally positive for both current and former editors, though their annoyance was clear when they discussed the attitudes of male editors towards them, which in some cases generated feelings of insecurity. This was the case for one editor (G2-JO), whose first editing job was deleted in its entirety because (according to the editors) of a lack of verifiable sources, which left her feeling "very frustrated."

Generally speaking, respondents expressed a strong sense of responsibility in relation to ensuring that their work did not mislead *Wikipedia* readers (G3-NR and G3-IG). They also expressed an awareness that *Wikipedia* is one of the most important sources of information for schools (G2-NR and G1-VC) and therefore understood the importance of conveying a sense of the diverse nature of society and avoiding the presentation of a "skewed perspective."

The participants with doctorates or master's degrees expressed greater confidence in their editing ability (G2-NR, G3-NG, and G4-CM), explicitly stating their willingness to engage in debate on the subjects of their profession. They emphasized the need to take editing seriously and work to the very best of one's ability, and that the research method helped editors in their tasks. One editor (G3-NG) thought that women were more insecure: "Girls are more fearful; or rather, they aren't daring."

When asked directly whether they had sufficient confidence in themselves to work as editors, three admitted that they were not afraid to make mistakes (G1-LF, G1-JC, and G2-NR) and thought that learning to edit was very straightforward (G1-LF and G1-CA). This self-assurance was reflected in the subjects they chose for their articles, although even in areas where they didn't believe themselves to be experts they still felt they were competent enough to write content (G1-JC and G1-CA). As one editor points out, "one of the biggest advantages of *Wikipedia* is that you don't have to be an expert on a subject to be able to write about it; if you have the research elements, you have the elements you need to write an article" (G1-CA). Three participants said they did not consider themselves experts but that they were able to get by using information sources or with the support of their colleagues, both male and female (G4-AV, G4-NOR, and G4-FP).

The interviewees who were self-taught in editing *Wikipedia* (G3-NG and G3-VC) felt as confident as those trained in a group setting. One editor (G2-JO), however, admitted that she felt insecure when not editing as part of a group: "I had to strike out on my own and I was afraid of making mistakes."

The respondents' stance on sexist language was related to the creation of content in which both current and former editors aimed to emphasize the professional work of prominent women, omitting their husbands' names, the number of children they had, and other details not generally found in men's biographies. For the active editors, it was especially troubling that stereotypes of women were being maintained, and, for example, that articles on female porn stars including descriptions of their physical features were allowed to be published. One editor (G1-CA) believed that there was a lack of information on women in general, not necessarily just on feminist women.

Another respondent (G3-NG) suggested that the structure of *Wikipedia* itself was sexist, because of its language as well as its content review structure: "it isn't feminist at all, nor is it neutral. Because it's primarily the males who have edited more, they get reviewed less and they get more recognition... And so it doesn't surprise me at all that it tends to be sexist."

Despite such criticism, all of the active editors interviewed (with the exception of G1-LF) explicitly stated that they had created content specifically about women, including feminist women, mostly on projects stemming from edit-a-thons. Two former editors also stated that they had created such content: G2-NR, who remembered editing the biography of a woman without taking inclusive language into account; and G4-NOR, who said that she had prioritized content about women "to redress the balance." The remaining participants did not explicitly state whether or not they prioritized the editing of content dedicated to women.

5. Discussion and conclusions

Wikipedia is one of the world's most important information sources and has become one of the most widely consulted digital platforms in the world, especially by elementary and secondary students. It is therefore essential for its content to include a gender perspective that contributes to the construction of a more egalitarian society.

Our analysis of the gender gap takes a closer look at the different factors related to editing practices on the Spanish *Wikipedia*. Our participants were women who had worked as content editors for the Spanish *Wikipedia*, from eight different predominantly Spanish-speaking countries. These are women who fit a university graduate profile and have research skills, who work outside the home and bear at least 50% of the responsibility for household and family tasks.

We found that the main differences in the experiences of current and former women editors of the Spanish *Wikipedia* were related to the way they became involved in *Wikipedia*, and the subjects they write about. The respondents who no longer worked as editors for *Wikipedia* started editing on an edit-a-thon project, while most of the current editors worked alone, although they also contributed to and supported *Wikipedia* events to promote the presence of women on *Wikipedia*. In fact, current women editors were more likely to be feminist activists on *Wikipedia*, meaning that they write and edit with a gender perspective, while former women editors tended to write more about subjects related to their hobbies, interests, or work. All of the respondents agreed that *Wikipedia* is sexist in its use of language, although not all of them reported using inclusive language in their own edits, trying to find neutral grammar forms. A recent study has shown that if a language contains an inherent gender-bias, which is the case of Spanish, then it is more likely to preserve gender stereotypes, as linguistic associations shape people's implicit judgements. "Countries with high male-career gender bias also have low percentages of women in STEM fields, and fewer female students in STEM higher education" (**Lewis**; **Lupyan**, 2020).

Both categories of women editors interviewed (current and former) express an overall sense of satisfaction with the experience of editing for *Wikipedia*, although all respondents acknowledge having experienced some negative situations related to efforts to add a gender perspective or just the awareness that they are a minority. But the active editors keep on editing, and the former editors report that they would resume the work if they could find the time. As a matter of fact, our quantitative study proves that if women persist in editing, the number of edits they are responsible for could exceed that of men (**Minguillón** *et al.*, 2021).

A factor that has emerged as critical in this study is time, as both the current and former editors interviewed reported time constraints limiting their editing work. The current women editors said they tried to find time every week, while former editors worked more intermittently. Indeed, the time factor reveals clear differences between women and men in relation to editing *Wikipedia*. Data gathered in our quantitative study confirms the qualitative data obtained in this research showing that women edit on fewer days than men and for shorter lengths of time. We agree with **Hinnosaar** (2019) that inequality in the division of household labor and family responsibilities is one of the reasons why women edit less than men and for the different uses made of other digital media by men and women (**Kennedy**; **Wellman**; **Klement**, 2003).

This imbalance in housework profoundly affects the gender gap on the Spanish *Wikipedia*. According to empirical evidence, men and women dedicate dramatically different amounts of time to unpaid care work in most societies. All over the world, women spend more time than men on these activities. However, there are clear differences when it comes to the magnitude of these gender gaps. At the low end of the spectrum, in the United States and United Kingdom, women work 1.6 and 1.8 times more than men, respectively, in unpaid care activities at home, while at the opposite end of the spectrum, in Spanish-speaking countries (which are the focus of this paper) such as Spain or Colombia, women work at least 3 times more than men on these activities (**Ortiz-Ospina**; **Tzvetkova**, 2017).

However, *Wikipedia* was originally founded on the idea of providing a Free Universal Encyclopedia and Learning Resource, emerging out of the free software movement in which the collaborative generation of knowledge would occur among equals (**Lih**, 2009). It claims to be a community that is open to everyone, but just claiming this does not mean that such openness is real or even encouraged. Richterich has analyzed hacker communities and their gender social dynamics and found that they are almost exclusively made up of white men from the Western world (**Richterich**, 2020). This does not mean that male editors on *Wikipedia* consciously dominate and favor men over women, but that their ideology undermines the introduction of rules or goals related to diversity and fosters a culture discouraging to women. *Wikipedia*'s guidelines govern the way that the encyclopedia operates in relation to dominant discourses on age and gender (**Gauthier**; **Sawchuk**, 2017). Its ideology is based on the idea that universality is homogeneous as it appeals to impartiality while difference and plurality are excluded (**Arendt**, 1974; **Young**, 1992; **Landes**, 1992). Recognition of their specificity as women, a solidarity community that takes into account equality and differentiation (**Benhabib**, 1992), and the need to hear the dissenters' voice (**Mouffe**, 2000) are critical elements for including women on *Wikipedia*.

Women's voices on *Wikipedia* are heard on content pages but rather quiet on discussion pages. The women editors interviewed for this study suggested that they do not enter into discussion or arguments on editing issues because they do not have much time and prefer to invest it in editing rather than in justifying their editing decisions. Interpersonal communication strategies developed in the editing process appeared to play a decisive role in the persistence of women editors, either as a consequence of their participation in collective editing experiences or thanks to discussion, comments on user pages, and friendlier and more polite justifications of corrections. In fact, the former editors interviewed did not use the discussion pages, which are meant for the expression of opinions and the defense of contributions. This was the main difference found between active editors and former editors, that the former used these discussion pages and the latter did not. This finding was also confirmed in our quantitative study. The reason given by the former editors was that they found these spaces aggressive and considered them to be hostile male-dominated territories. Most of the bad experiences reported by the respondents occurred on these discussion pages where, as with *Wikipedia* in general, women are a minority and feel insecure and undervalued.

Some authors have argued that the feelings described above stem from women editors' lack of confidence in their own skills or knowledge (**Gardner**, 2011). However, as **Hargittai** and **Shaw** (2015) suggest, we have found that women who

have attained the competences needed for editing feel that they are capable and knowledgeable. The factors influencing women to give up editing were therefore more associated with the *Wikipedia* culture, its capacity for inclusion (**Menking**; **Erickson**; **Pratt**, 2019), and its verification policies, which are dependent upon previously published information sources and are detrimental to rare content on the web (local content, minority languages, content by and about women, etc.) and reinforce the pre-existing skewed view. The verification policies procedure will be studied in future research in order to explore how the lack of a female presence in the public sphere influences the rejection of women's biographies on *Wikipedia*.

Another reason offered for giving up on *Wikipedia* was related to problems of gender identification (**Gardner**, 2011). On the Spanish *Wikipedia*, gender can be identified as female, male, or unknown. As **Massa** and **Zelenkauskaite** (2014) have shown, only a small percentage of editors decide to include their gender in their profile, especially during the creation of a new user profile. However, we found that all our participants were in favor of being identified as female but that a number of them were unaware that the platform facilitated this option.

Women's behaviors on *Wikipedia*, such as editing fewer pages, focusing on more specific issues, and not tending to create new pages, are not related to a lack of training or competence but to a lack of time. The small percentage of long-term women editors exhibited an editing behavior as active as or even more active than men in terms of number of edits. Women editors in this category create more pages and contribute more to discussion pages.

One of the main contributions of this study is the confirmation that edit-a-thons (or *Wikiquedadas* in Spanish) are a means of technological empowerment for women editors, while also providing a safe and trusted social environment, both of which are key factors in helping women to feel included, as **Haché** (2011) and **Gardner** (2011) also point out. These initiatives also address subject areas that help bridge the gender gap on the platform (**Hood**; **Littlejohn**, 2018). These events can be viewed as self-inclusion strategies as they involve not just getting started, but carrying on, remaining, advancing, recognizing and being recognized, and even contributing, as **Vergés-Bosch** (2012) points out. Digital self-inclusion processes are important in that they enable women to participate, publicly and virtually, in the creation of a public opinion space (**Fortunati**, 2004). All of the former short-term editors interviewed started editing as part of a group, in collaboration on a common project, with collective support. While it is true that the internet has exponentially increased the potential for creating discussion and action among social groups that have traditionally been ignored (**Castaño**, 2012), we still need to abandon the idea that women's access to technology will occur naturally, spontaneously, and automatically, and instead proactively promote digital equality (**Vázquez**; **Castaño**, 2011) through strategies that situate women as agents of their own ICT-related inclusion (**Rommes** *et al.*, 2004). However, we agree with **Vergés-Bosch** (2012) that one of the main conclusions of this research is that these self-inclusion enabling projects are at risk of coming to an end, resulting in the departure of women editors after only a short time working on the platform. To prevent this from occurring, permanent and stable offshoot networks from the proximity network provided by edit-a-thons should be encouraged as a mechanism for protection, collaboration, and empowerment.

It is noteworthy that the vast majority of long-term women editors joined *Wikipedia* with the intention of taking part in the production of content that helps to enhance the visibility of women, particularly by editing pages of biographies in which women are the subjects as well as significant actors contributing to their geographical environments. The fact that they started editing in edit-a-thons with the same vocation may be indicative of their motivation. Motivation is also an important element of self-inclusion processes, as without it, and without enabling elements such as edit-a-thons, the editing process would not be possible (**Vergés-Bosch**, 2012). As indicated in the *Unesco Unitwin* publication *Gender, Media & ICTs* (**French**; **Vega-Montiel**; **Padovani**, 2019), these processes must acknowledge and address gender inequalities in the media and ICTs, given that the position of these sectors in society is strategic and fundamental to the reproduction of models (**Beaman** *et al.*, 2012; **Vega-Montiel**; **Macharia**, 2018) and the building of a society in which gender equality is a reality.

It is a point of concern that all the women who gave up editing admitted to having had a bad experience as a result of gender conflicts and the hostile atmosphere on the Spanish *Wikipedia*. One woman editor who was able to edit in another language left the Spanish *Wikipedia* for a smaller, less aggressive edition of the platform, supporting the point made by **Gardner** (2011) that women tend to avoid atmospheres they consider confrontational and aggressive. This is also consistent with **O'Brien**'s (2014) argument that "a woman who wishes to share knowledge with others might not choose to be part of a forum where engaging in deleting others' words is key" (2014). Even today in public debate, the assertion of one's position is often seen as male stance.

As Spanish is a language that uses grammatical gender, women editors tend to correct content by applying a neutral gender in order to make the language more inclusive, although there was agreement among respondents that it is hard to get such expressions accepted. This reinforces the notion posited by **Sichler** and **Prommer** (2014) of women's social inferiority due to access to language being through a masculine system of representation that alienates a woman's relationship to herself and to other women. The reality of the world is constructed with the intertwining of plural perspectives, and if this basic condition is not achieved, the common world collapses when it is only possible to see one aspect of a reality presented from only one perspective (**Arendt**, 1974).

Indeed, the task of building a more equitable world in terms of gender is being done on the Spanish *Wikipedia* mainly by women. Women editors create and edit pages with feminist content and recognize the need to correct misogynist language and to eliminate grammatical male gender whenever a neutral form could be used.

Finally, we consider it pertinent to consider the recommendations contained in *Unesco*'s *Gender-Sensitive Indicators for Media* (**Grizzle**, 2012): that the *Wikimedia Foundation* should include gender policies, facilitate information from a gender perspective, monitor for inclusive content, and help to raise reader awareness of gender issues. Although *Wikipedia* is an encyclopaedia produced by the efforts of volunteers, both male and female editors must be made aware of the need to create content and sources that contribute to gender equality, and if necessary a training mechanism should be put in place to ensure that *Wikipedia* content reflects the true composition of society and eliminates stereotypes, as recommended by *Unesco*.

In fact, the *Wikimedia Movement*, which includes the *Wikimedia Foundation* and all the different language editions and regionally based affiliates, has recently agreed on a new strategic direction towards 2030, which sets a goal of knowledge equity ("focus our efforts on the knowledge and communities that have been left out by structures of power and privilege [...]").
https://meta.wikimedia.org/wiki/Strategy/Wikimedia_movement/2018-20

This strategy document establishes the objectives of eliminating the gender gap and focusing on the inclusion of underrepresented groups. However, no specific actions or initiatives have been developed yet.

In the case of the Spanish *Wikipedia*, as this research has demonstrated, inclusive language must be a part of the editing process. This has become an issue of vital importance in society and is one of the challenges raised in the *Unesco Unitwin* publication *Gender, Media & ICTs* (**French**; **Vega-Montiel**; **Padovani**, 2019), which underlines the importance of contributing to the creation of gender equality by providing institutional support for proposed activities and for any educational program related to ICT and the media. In this respect, the women we interviewed found the edit-a-thons the ideal space for training and socializing.

It is important to highlight certain limitations of this study. In order to obtain the sample for the interviews, we contacted 142 women editors and former editors randomly, firstly via their *Wikipedia* user pages and subsequently by searching for their email addresses on platforms such as *LinkedIn*. Only twelve affirmative replies were obtained within one month of the latest contact. It must therefore be acknowledged that the response rate was low and the sample small. Nevertheless, the aim of this study is of a qualitative nature and we make no attempt to generalize given the sizes of the sub-samples. As stated in the introduction of this paper, the study aims to describe and explore the experiences of current and former women editors on a digital platform where they are clearly a minority, and our conclusions address matters related to how to increase the participation of women and to prevent them from giving up on editing one of the world's most important learning resources and most widely used websites. Another limitation of this research is its treatment of the concept of gender as binary (female/male), rather than recognizing the diversity of gender identities. This is due to the fact that the study focuses on the gender categories established by *Wikipedia*, which are limited to female, male and other.

Future research should address the weaknesses described above and aim to determine why, how, where and whether women are welcome in the ICT sector, and to discover why they tend not to participate in this sector. The analysis of male editors on *Wikipedia* from a gender perspective and the sexist attitudes expressed on discussion pages and in forums constitute other lines of research that could contribute to raising awareness about gender equality in the editing environment on the Spanish *Wikipedia*.

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