

Disinformation as a Widespread Problem and Vulnerability Factors Toward it: Evidence From a Quasi-Experimental Survey in Spain

ROBERTO GELADO-MARCOS¹
PLÁCIDO MORENO-FELICES
CEU San Pablo University, Spain

BELÉN PUEBLA-MARTÍNEZ
Rey Juan Carlos University, Spain

In recent years, several institutions have alerted the effects of information disorders while struggling to handle the problem effectively. Our investigation triangulates between qualitative and quantitative approaches: on the one hand, focus groups adapted to the digital landscape (which many have hinted is an environment naturally favoring disinformation) were used; on the other, a quasi-experimental survey was conducted with 4,351 stratified respondents. The results provide evidence-based data that both confirm the widespread nature of vulnerability—more than half of the Spanish population presents a relevant degree of vulnerability toward disinformation—and spot specific groups that may require targeted actions to ease the effects of information disorders.

Keywords: disinformation, vulnerability, fake news, social media, Spain

Nowadays, we live in overexposure to the concept of fake news induced largely by the media themselves. The final report of the High-Level Group of Experts (HLEG) set in January 2018 by the European Commission “to advise on policy initiatives to counter fake news and disinformation spread online” pointed out, however, that the term “fake news” was not the most adequate when referring to the phenomenon, and recommended “disinformation,” as an alternative (European Commission, 2018a, p. 5). In its glossary on information disorders, the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2018) was even more specific and, echoing First Draft’s (a nongovernmental

Roberto Gelado-Marcos: roberto.geladomarcos@ceu.es

Plácido Moreno-Felices: placido.morenofelices@colaborador.ceu.es

Belén Puebla-Martínez: belen.puebla@urjc.es

Date submitted: 2021-09-24

¹ This research is part of the project “A Study of the Factors Conditioning Disinformation and a Proposal of Solutions to Fight its Impact Regarding the Vulnerability Levels of the Groups Studied,” funded by Fundación Luca de Tena and Facebook in the framework of the public call “Academic Research on Disinformation in Spain. An Approach to the Anthropological, Economic and Sociological Aspects That Motivate it; History, Dissemination, and Current Situation; and Proposals to Solve it.”

Copyright © 2022 (Roberto Gelado-Marcos, Plácido Moreno-Felices, and Belén Puebla-Martínez). Licensed under the Creative Commons Attribution Non-commercial No Derivatives (by-nc-nd). Available at <http://ijoc.org>.

organization [NGO] launched in 2015 to fight the impact of information disorders) views, advocated differentiating among disinformation ("information that is false and the person who is disseminating it knows it is false"), misinformation ("information that is false, but the person who is disseminating it believes that is true"), and malinformation ("information that is based on reality, but used to inflict harm on a person, organization or country"; pp. 44–45).

Civic Reasoning and its Importance for Citizenship and a Well-Functioning Democracy

An essential pillar of active citizenship in a digital world is its ability to maintain civic online reasoning, defined by McGrew, Breakstone, Ortega, Smith, and Wineburg (2018) as the capacity "to effectively search for, evaluate and verify social and political information online" (p. 165). This cross-refers to Kovach and Rosenstiel's (2007) claim that informed citizens are key to fostering social progress since "a debate between opponents arguing with false figures or purely on prejudice fails to inform. It only inflames. It takes the society nowhere" (p. 43).

Recent decline in citizen trust—as discussed, for instance, by Brosius, van Elsas, and de Vreese (2019) in their study of the European institutions—though, has pushed some to affirm that we are witnessing a collapse of public communication (Macnamara, 2018). Information disorders have altered, at the same time, all instances of the communication process and the foundations of democratic societies (Monnier, 2018).

Disinformation can manipulate individual behaviors and social debates, diminish trust in science (European Commission, 2018b), and even distort history (Magallón-Rosa, 2018). The World Economic Forum has pointed out that massive digital disinformation is at the center of a set of technological and geopolitical risks, which include, among others, terrorism, cyberattacks, which, as Bennett & Livingston (2018) have pointed out, seek, in most cases, destabilization—of parties, governments, and nations—and institutional delegitimization, boosting pro-authoritarian discourses (Abrahams & Leber, 2021) or provoking general failure of global governance (Howell, 2013).

Nemr and Gangware (2019) have warned of the potential consequences that information disorders may have on the general public, broadening the implications of the phenomenon to also include citizens' lack of information on certain issues, as other authors such as Rivas Troitiño (1995) had already suggested decades earlier. Disinformation also benefits from an increasing demand by the audience for news focused on emotional aspects—stories that are more likely to be shared again among family and friends on social networks, as suggested by Bakir and McStay (2018, as cited in Monteiro & Rampazzo, 2019).

According to Amazeen, Thorson, Muddiman, and Graves (2018), people are biased information processors, sometimes even in the face of indisputable evidence (Kelly, 2019)—the extent is such that objectivity matters much less than the way in which what is encountered matches personal beliefs. Some studies have also focused on spotting key variables that could be connected to different methods of disseminating information disorders: Buchanan (2020), for instance, concluded that "gender and education were statistically significant predictors, with men and less-educated people reporting a higher likelihood of

sharing [disinformation]" (p. 11) whereas Figueira and Santos (2019) focused on young audiences and a university-student profile to assess the impact of information disorders.

Technology and the Asymmetries of Knowledge

UNESCO (2018) already anticipated that the new digital ecosystem favored the work of agents dedicated to disinformation in several ways (p. 59). However, recent studies, such as the one conducted by Stetka, Surowiec, and Mazák (2019) comparing the use of Facebook for political communication purposes in the Czech Republic and Poland, have asked for a more specific examination of "the role and significance of social media" (p. 138). The goal is to provide a more adjusted picture of phenomena that rapidly emerge in this constantly changing environment (p. 138).

In a scenario of information disorders, several agents may be involved—who creates the message may differ from who produces it and who distributes it (Wardle & Derakhshan, 2017). Some studies have drawn attention to the fundamental role of bots for the spread of disinformation (Ferrara, 2017; Klyueva, 2019). Bots are, as Shao and colleagues (2018) have noted, key in amplifying content in its initial moments of propagation. Larger studies, however, have found that "false news spreads more than the truth because humans, not robots, are more likely to spread it" (Vosoughi, Roy, & Aral, 2018, p. 1146).

Subsequent schemes to battle information disorders have led to what Andersen and Søre (2020) have labeled an obsessive attempt that can result "in danger of overestimating the value of critically evaluating sources at the expense of acknowledging the existence of fictions too" (p. 129). Bennett and Livingstone (2018) agree on the irony "that this amplifier effect may be strengthened when quality news organizations attempt to fact check and correct the record" (p. 124).

Studying information disorders also requires the analysis of the phenomenon from the perspective of the messages themselves, as well as the audiences and how they relate to this type of contents. As Yadlin and Shagrir (2021) point out, there seems to have been a prevalence of studies around disinformation where "academic attention has been thus primarily given to fake news as content (. . .) their characteristics and impact," when "our knowledge about media audience perceptions of the phenomena" is, at least, equally relevant (p. 2541). For this reason, our study will aim to shed light on the receiving end of information disorders, with a keen eye on the current situation in Spain.

A Methodological Approach to the Study of Disinformation in Spain

Disinformation can be seen as a phenomenon that, rather than created, has been triggered by modernity and technology, a combined action (to paraphrase Latour's 2005 actor-network theory) between humans and technologies whose harmful side effects have been naturally subsumed by modern cultures in a way similar to that in a risk society described by Beck (1992).

What is defended in this article, thus, is that—embedded as it seems to be in the updated notion of modernity—disinformation is a widespread phenomenon that affects citizenship as a whole. For this reason the main focus of our investigation hinges on the verification of the following main hypothesis:

H1: Disinformation in Spain is a widespread problem that affects the majority of the population.

Nevertheless, the potential that targeted actions have on disinformation make it also worth studying its effects in a more segmented manner. The European Commission (2018b) has drawn attention, precisely, in this respect, to uneven vulnerability patterns toward information disorders “from one society to another, depending on education levels, democratic culture, trust in institutions, the inclusiveness of electoral systems, the role of money in political processes, and social and economic inequalities” (para. 22).

Finding specific audiences that are particularly vulnerable to the effects of disinformation may be key to articulating strategies to counter such outcomes. The success of these actions will also depend on how realistic the set goals are. As authors like Bennett and Livingstone (2018) have argued before us, disinformation as a certain risk can be handled much more than it can be eradicated. Thus, actions need evidence-based data on the global nature of disinformation itself as well as on the specificities of vulnerable sectors of the population, in addition to strategies to fight information disorders in a more accomplished manner. To make informed decisions in this respect, the following secondary hypotheses were projected:

H2: Younger sections of the population are more vulnerable to disinformation.

H3: Population with greater levels of education are less vulnerable to disinformation than those with lesser levels of education.

H4: Citizens living in households with lower income are more vulnerable to disinformation than those with higher income.

Our methodology triangulated (Lewis-Beck, Bryman, & Futing Liao, 2004) between qualitative and quantitative techniques as the different stages of our research required approaches that adapted to their specific needs. Methodological triangulation applied to the study of information disorders has been used before by researchers like Nielsen and Graves (2017), who analyzed “data from 8 focus groups and a survey of online news users to understand audience perspectives on fake news” (p. 1) with age groups segmented for the focus groups between younger (20–34) and older (35–54). On a smaller scale but with a similar triangulated approach, Collado, Basco, and Sison (2020) used surveys and focus group discussion to analyze online disinformation among the Filipino youth.

In our research, it was first determined that the investigation had to be completed with an extensive survey to provide sufficient evidence-based data that allowed the confirmation or rejection of the main hypothesis on the presumed generalized nature of disinformation. Amazeen and Bucy (2019) too used survey evidence to expose a link between the knowledge of how news media operate and a better capacity to identify “fabricated news and native advertising” (p. 415), acknowledging, though, that the lack of an experimental design would make “strong causal inferences (. . .) premature” (p. 429).

The present research aimed at expanding the knowledge coming from preexisting literature on vulnerability patterns with further exploratory qualitative research that should precede, and subsequently

inform, the quantitative phase. Since the aim was to assess the state of disinformation in Spain, the study focused on the Spanish population.

Qualitative Phase: From Focus Groups to Sensors

This preliminary step was conceived, firstly, to be implemented through focus groups that would give us a sense of possible patterns of vulnerability and general reactions toward information disorders. The use of focus groups—for instance, by Wenzel (2019) in her study on “how audiences grapple with pervasive ambiguity” (p. 1977)—has, also, been observed as one of the recurring methodological approaches to the study of mis/disinformation in Seo and Faris’s (2021) comparative analysis.

On the basis of what had been hinted at by previous literature, a series of key variables were set out to be proportionally represented in the subjects sampled for the focus groups, namely gender, age, geographical location, income level, and level of studies (see Figure 1).

	INCOME LEVEL MEDIUM-HIGH		INCOME LEVEL MEDIUM-LOW		TOTAL
	↗ STUDIES	↘ STUDIES	↗ STUDIES	↘ STUDIES	
ADOLESCENTS (14-17)	5 PARTICIPANTS		4 PARTICIPANTS		9 PARTICIPANTS
YOUNG ADULTS (18-24)	6 PARTICIPANTS		3 PARTICIPANTS		9 PARTICIPANTS
PARENT CHILDREN (<12)	10 PARTICIPANTS		3 PARTICIPANTS		13 PARTICIPANTS
PARENT CHILDREN (>12)	3 PARTICIPANTS		8 PARTICIPANTS		11 PARTICIPANTS
EMPTY NEST (+55)	3 PARTICIPANTS		5 PARTICIPANTS		8 PARTICIPANTS
TOTAL	27 PARTICIPANTS		23 PARTICIPANTS		50 PARTICIPANTS

Figure 1. Sample of participants for the qualitative stage of the investigation.

After the first round of meetings with the company that would help us recruit the participants of the focus groups and its subsequent implementation, a research technique called Sensors was suggested by the company running the fieldwork, and it perfected in many ways the initial idea of the focus groups. Sensors is an ad hoc online platform, conceived to reproduce the natural environment more closely, under which users consume potential sources of (dis)information, rather than the usual meeting room for focus groups. The groups selected to participate in the first stage of the research were still recruited to proportionally represent the

aforesaid variables, but instead of exposing them to the traditional experience of a focus group, they were invited to join the online platform and remained in it for a lengthier period of time.



Figure 2. Sensors community used in the preliminary research stage.

Source: Análisis e Investigación (A&I).

This was possibly the biggest advantage that the Sensors community offered. The original focus groups were conceived to last two to three hours and were planned for repetitions of two or three waves, which would have reduced the interaction with the sampled participants to a maximum of nine hours. The interaction on the Sensors platform, which was still guided by a moderator, happened over two months. This aimed at decreasing the amount of prestige answers given by the interactants, because it ended up being experienced as a daily routine: they visited the platform in the same way they usually visit their social networks—in fact, Sensors' interface largely resembled some of the most famous social media sites (see Figure 2), rather than a one-off experiment conducted in an environment different from their usual milieus of content consumption.

During the first week of the Sensors stage, participants were allowed to familiarize themselves with the platform; simultaneously, their patterns of media consumption and the areas of their interest were identified. Between weeks 2 and 3 the main goal was to identify the variables that influenced reception and redirection of contents by the participants; and between weeks 4 and 6 the goal was to not only stimulate interactants so that they posted content but also, once the routine was created, observe, rather, which unsolicited content they started to share and how. In the last two weeks of the experiment, the Sensors community was operating almost without any mediation of any kind on the part of the moderator, so these were devoted to refining the observed patterns of consumption and redistribution of disinformation.

These last conclusions of the preliminary qualitative stage helped configure the questionnaire for the final survey that the second part of our research dealt with. The first methodological step of the

quantitative phase was determining what was measurable. In other words, the scope was reduced to ensure that the observation was conducted in an appropriate manner.

The Quantitative Stage of the Research

The present field of study is broad, slippery, and full of nuances. However, from a quantitative perspective, it was essential to have specific, well-defined, and operationalizable concepts. Under this premise, the first step was to establish what could and what could not be measured. This necessarily implied leaving out of the scope of the study certain aspects or dimensions that were difficult (if not impossible) to address from a quantitative perspective. In other words, the scope of this part of the study was purposefully reduced to ensure that the observation was conducted properly.

As one of the main research goals was to determine the factors that made disinformation more credible or less credible, it was essential, to begin with, to define these factors to measure and quantify their effect. In this sense, the qualitative phase of this research helped, among many other things, to establish an exhaustive list of elements that can affect credibility.

With the data obtained in the qualitative stage, a number of factors that could potentially affect the credibility assigned to (dis)informative contents were listed, and they were grouped into three main blocks: channel, source, and content.

- Those that have to do with the channel—understood as the way in which an individual knows or finds out about (dis)information.
- Those that related to the source—understood as the one who creates the story.
- Those that related to the nature of the content itself; that is, what disinformative messages say and how they are conveyed.

Under these three categories, the following factors were selected:

- Related to the channel:
 - Via
 - Repercussion
- Related to the source:
 - Type of media
 - Trajectory/reputation
 - Editorial line
 - Reach
- Related to the contents:
 - Topic
 - Specificity
 - Time frame
 - Style

Dimension	Factor	Level
CHANNEL	VIA	Social media - Well-known personality
		Social media - Not well-known personality
		Social media - Unknown source
		Close environment
		Direct Source
	IMPACT	High repercussion (likes, retweets, comments...)
		Little impact
SOURCE	TYPE OF MEDIA	Online
		Tradicional
	TRAJECTORY/ REPUTATION	High reputation
		Low reputation
	EDITORIAL LINE	Left
		Centre-left
		Centre-right
		Right
	REACH	Many readers
		Few readers
CONTENT	TOPIC	Politics
		Technology
		Economy
		Society
	SPECIFICITY	Specific with data
		Unspecific
	TIME FRAME	Current events
		Not current events
	STYLE	Sensationalist
		Moderate

Figure 3. Dimensions, factors, and levels used.

In total, 10 different factors that met the two criteria mentioned (their measurability and their potential to affect the credibility of messages) were considered. It was also necessary that respondents perceived the stimuli they were going to be exposed to in the experiment as stories that had (allegedly)

been published in some type of written media (either online or digital). Rumors coming from informal comments or broadcast media were left out of the experiment to guarantee a higher quality of the data.

Once the focus of the study was defined, the goal was to assess how to address the methodological perspective. Two possible approaches opened up:

- Retrospective: analyzing what respondents had already done (which stories had caught their attention recently, how they had reacted to those stories, how credible these stories had been, etc.). This alternative presented, though, some relevant problems: inaccuracies derived from invoking their memory, the effect of the spiral of silence or the prudent lie theories; and, perhaps the most relevant, the lack of control over the specific news in terms of the factors previously defined.
- Prospective: analyzing what respondents might do when faced with (dis)information. It is true that, since this would require a more experimental approach, respondents would be placed in front of a recreated situation. However, this approach allowed control over the stories to which the respondents were exposed; furthermore, drawbacks resulting from respondents having to resort to their memory would be eliminated. Also, because a prospective analysis asked for an experimental design, its systematicity, replicability, and soundness of the final results would be higher.

Once the pros and cons of the two possible research paths were analyzed, the decision to opt for the latter and therefore submit the respondents to an experimental situation was made: They would be exposed to a number of stimuli (news) and indicate, through the questionnaire, how they perceived them and how they would react to them.

The use of real headlines and stories was considered, but it was discarded mainly because of the complexity of finding valid examples of all the variations that needed to be measured. Also, previous knowledge of these stories could affect the credibility assigned to them, hence distorting the results for certain variables. Creating the headlines from scratch excluded that possibility and left the respondents alone with their own perception of truthfulness toward the contents to which they were exposed.

As a result of this, ad hoc fake stories were created for this investigation, with an aim at controlling the different factors that needed to be measured. However, all possible combinations of the factors and their different subcategories generated such a high number of cases that it seemed virtually impossible to handle in research. Because of this, a fractional factorial design was created, and it ultimately reduced the number of possible combinations to a more manageable one.

The resulting design met the following criteria:

- Orthogonality: A design is orthogonal when the number of times a level of a factor is compared with all levels of the rest of the factors is equal or proportional.
- Balance: A design is balanced when the different levels of each factor are displayed the same number of times.

- Positional equilibrium: There is positional equilibrium when all the levels appear in different positions a similar number of times.

The final design of the factors and combinations used is shown in Figure 4.

VIA	IMPACT	TYPE OF MEDIA	TRAJECTORY/ REPUTATION	EDITORIAL LINE	REACH	TOPIC	SPECIFICITY	TIME FRAME	STYLE
Direct source	High	Traditional	Reduced	Centre-left	Few readers	Health	Specific	Not current events	Moderate
Not well-known public personality	Reduced	Traditional	Reduced	Left	Many readers	Health	Unspecific	Current events	Sensationalist
Well-known public personality	High	Traditional	Reduced	Centre-right	Many readers	Economy	Unspecific	Current events	Moderate
Not well-known public personality	Reduced	Traditional	High	Left	Few readers	Economy	Unspecific	Current events	Moderate
Not well-known public personality	Reduced	Online	Reduced	Centre-left	Few readers	Economy	Specific	Current events	Moderate
Well-known public personality	Reduced	Traditional	High	Right	Many readers	Health	Specific	Not current events	Moderate
Well-known public personality	High	Online	Reduced	Left	Many readers	Politics	Specific	Current events	Sensationalist
Close environment	Reduced	Traditional	Reduced	Right	Few readers	Politics	Unspecific	Current events	Sensationalist
Not well-known public personality	High	Traditional	Reduced	Centre-right	Many readers	Politics	Specific	Not current events	Moderate
Well-known public personality	High	Online	Reduced	Right	Few readers	Health	Specific	Current events	Sensationalist
Unknown	High	Online	High	Right	Many readers	Economy	Specific	Current events	Moderate
Close environment	High	Traditional	High	Centre-left	Many readers	Economy	Specific	Not current events	Sensationalist
Unknown	Reduced	Online	Reduced	Centre-left	Few readers	Politics	Unspecific	Not current events	Moderate
Unknown	Reduced	Traditional	Reduced	Left	Many readers	Technology	Specific	Not current events	Sensationalist
Well-known public personality	Reducida	Online	High	Centre-left	Many readers	Technology	Unspecific	Not current events	Sensationalist
Unknown	High	Traditional	High	Centre-right	Few readers	Health	Unspecific	Current events	Sensationalist
Unknown	Reduced	Traditional	Reduced	Right	Few readers	Economy	Specific	Not current events	Sensationalist
Not well-known public personality	High	Traditional	High	Centre-right	Few readers	Technology	Specific	Not current events	Sensationalist
Direct source	Reduced	Traditional	High	Right	Many readers	Technology	Unspecific	Current events	Moderate
Not well-known public personality	High	Online	High	Right	Many readers	Politics	Unspecific	Not current events	Moderate
Fuente directa	Reduced	Online	High	Centre-right	Few readers	Politics	Specific	Current events	Sensationalist
Close environment	Reduced	Online	Reduced	Centre-right	Many readers	Technology	Specific	Current events	Moderate
Unknown	High	Traditional	High	Centre-left	Many readers	Politics	Unspecific	Current events	Sensationalist
Well-known public personality	Reduced	Online	High	Centre-right	Few readers	Economy	Unspecific	Not current events	Sensationalist
Not well-known public personality	High	Online	Reduced	Right	Few readers	Technology	Unspecific	Not current events	Sensationalist
Unknown	High	Online	High	Left	Few readers	Technology	Specific	Current events	Moderate
Well-known public personality	Reduced	Traditional	High	Left	Few readers	Politics	Specific	Not current events	Moderate
Unknown	Reduced	Online	Reduced	Centre-right	Many readers	Health	Unspecific	Not current events	Moderate
Well-known public personality	High	Traditional	Reduced	Centre-left	Few readers	Technology	Unspecific	Current events	Moderate
Close environment	High	Online	High	Left	Few readers	Health	Unspecific	Not current events	Moderate
Not well-known public personality	Reduced	Online	High	Centre-left	Many readers	Health	Specific	Current events	Sensationalist
Direct source	High	Traditional	Reduced	Centre-left	Few readers	Health	Specific	Not current events	Moderate

Figure 4. Matrix of factors studied, and combinations used.

The more experimental approach of creating the contents that respondents were exposed to also allowed to control in a better manner the variables that were going to be considered. To avoid preconceptions that would distort the measuring of certain variables, it was also decided to give respondents features of the channel through which they randomly received the stimulus presented to them instead of using real names. For instance, the perception of the political leaning of a given media could differ greatly among respondents. However, if the stimulus that the respondent was exposed to specified, for instance, that the story would be read on an online platform, with a right-wing editorial line, it would be less open to interpretation, hence possibly perceived more univocally. Figure 5 shows an example of how respondents visualized the stimuli.

The 5G Network, harmful to health Research published by the WHO proves that the 5G Network will mean more health problems for users	
What media publishes the story?	Online newspaper
	Centre-left
	High reputation
	With many readers
Imagine, por favor, que te enteras de esta noticia de la siguiente manera:	Through a not well-known public personality, with few followers who share the story in some of their social media
	The story has little impact.
	It is scarcely shared, retweeted, forwarded, and commented.

Figure 5. Example of a stimulus that respondents were exposed to.

Also, it was decided not to expose all the respondents to the 32 stories built to measure the aforesaid categories so that excessive interviewing time could be prevented, since this could affect the respondents' concentration and, as a result of that, the validity of their answers. Therefore, it was finally decided that each respondent would visualize six news stimuli, and that message rotations would be accordingly designed to ensure that each respondent was exposed to a wide range of messages related to the measured factors. For each one of the six stimuli, respondents were queried about (1) their interest in the story (since the results of the qualitative stage hinted that this could be an influential factor), (2) their behavior after being exposed to said content (Would they click on the content? Would they read the whole story? Would they look for more information? Would they share it on their social networks? Would they comment on it within their immediate environments (friends, relatives, colleagues . . . ?), and (3) the degree of credibility they assigned to the information.

To address the research goal of spotting factors of vulnerability toward information disorders, certain variables of the respondents were measured in the questionnaire: gender, age, level of studies, level of Internet consumption, ideological standing, and socioeconomic position.

Also, to determine the weight of each of the factors in the credibility (and interest) of the news, it was decided to use Conjoint analysis procedure. Conjoint is a statistical procedure that allows determining the importance of a series of aspects or characteristics, but without directly asking about them. Conjoint was originally developed in 1974 by Paul Green, a professor at The Wharton School, for use in mathematical models of psychology and its application to marketing. However, the use of Conjoint was limited for many years mainly for two reasons: the complexity of designing, implementing, and analyzing a study of this type and the lesser capacity of computers in the 1980s and 1990s to perform studies of this type. In recent years, this technique, among others, has once again received the attention of researchers because today's computers can carry out complex analyses in minutes, or a few hours at the most. Conjoint produces a utility score, called a part-worth, for each factor level. In the case of this research, these scores provide a quantitative measure that expresses the effect of each level on the credibility of each news item.

The Survey

The methodology chosen for this phase was an online survey panel. The decision to use this type of survey responded, fundamentally, to the need to show the stimuli to the respondents. The online survey allowed them to read all the information without any sense of urgency. If a telephone survey had been used, it would have been more difficult for the participants to assimilate all the stimuli and give quality responses.

Compared with other alternatives that also provide the interviewees with enough time to read the stimuli, online surveying also allows a greater geographic dispersion, which ensures a more representative sample.

The surveys were completed following a stratified random sampling procedure with a proportional allocation for each of the selected sectors. Thus 4,351 surveys were completed, which, over the targeted universe, entails a confidence interval of 95.5% and, in the usual sampling conditions, with $p = q = 5\%$, the sampling error for the entire sample is $\pm 1.48\%$. The survey had a quasi-experimental character because the individuals studied were exposed to different stimuli to test their reactions. The complete data sheet of the survey can be seen in full detail in Figure 6.

UNIVERSE: Spanish general population

TYPE OF INTERVIEW: Computer Assisted Web Interview (CAWI)

SAMPLE: 4,351 surveys

TYPE OF INTERVIEW:

Stratified random sampling procedure following a proportional allocation for each of the selected sectors. The strata were defined on behalf of the education level, crossed with age and gender.

EDUCATION LEVEL	AGE				
	16-20	21-35	36-55	56-65	>65
PRIMARY AND SECONDARY STUDIES	411	339	346	341	342
GRADUATES OR MORE	0	546	680	670	676
TOTAL	411	885	1026	1011	1018

SAMPLING ERROR:

With a 95.5% confidence level, and within the usual sampling conditions $p=q=50\%$, the sampling error is $\pm 1.48\%$.

QUALITY CONTROL:

International Quality Standard ISO 20252 and ICC/ESOMAR code of conduct.

FIELD OF WORK:

The interviews were conducted between November 25 and December 4, 2019.

Figure 6. Survey's data sheet.

Results

The results of the quantitative stage, which, as explained previously, was planned and structured bearing in mind the preliminary results obtained in the qualitative stage through the Sensors platform, allowed us to shed some more light on the central issue of the factors conditioning vulnerability toward information disorders.

The following question was posed to the respondents:

Now we are going to show you all the news (the six that they had been exposed to). Bear in mind that everything has been published in the described media and that you became aware of the story as we indicated. To what extent would you have doubts about its truthfulness?

Around this question, an indicator of vulnerability was defined by the average results obtained through a Likert scale with the following possible answers:

- I don't believe it at all.
- I don't believe it, but I have doubts whether it is true or not.
- I don't know whether I believe it or not.
- I believe it, but I have doubts whether it is true or not.
- I totally believe it.

Each response was assigned a value from 1 (= I don't believe it at all) to 5 (= I totally believe it). The question was asked for each of the six stimuli that respondents visualized, and all the stories were completely made up to avoid distortions (because if real stories had been chosen, respondents would have had real referents to affirm the stories' truthfulness, which may have provided a distorted measure of credibility). The indicator oscillated between a minimum value of 1, which expresses the lowest level of vulnerability (the respondent believed none of the six stories whose headlines they were exposed to), and a maximum of 5 (he or she totally believed all of them).

Since our central hypothesis suggested a generalized problem with information disorders for the Spanish population, the general results were checked in the first place. At first glance, the average score for the entire sample stood at 2.95, which can be interpreted as an almost-perfect middle point of skepticism. This is also revealing, since it can be interpreted as generalized disbelief toward the news stimuli that Spanish audiences are exposed to, but it gets even more interesting in a detailed look at the breakdown of data:

- Around a sixth of the respondents gathers around the lowest and highest scores: 8.3% can be considered highly vulnerable (a score of 4 or more), and a very similar percentage (8.4%) would qualify as a little vulnerable (a score of 2 or more).
- The group labeled as vulnerable (the ones who scored between 3.00 and 3.99) accounts for almost half of the total number of respondents: 46.4%.

The aggregate of those that score 3 or more on the scale represents a total 52.9%. In other words, more than half of the Spanish population presents a relevant degree of vulnerability toward information disorders.

A Closer Look at Factors Affecting Vulnerability

After this general impression about the impact of information disorders on the Spanish population, the aim was to explore possible correlations between more specific factors that may be conditioning the vulnerability toward disinformation.

To achieve this purpose, both the aforementioned Likert scale and, whenever appropriate, the Pearson correlation coefficient were used. The latter was applied, for instance, to examine the relation between vulnerability and the interest stated by respondents toward the topics of the stories they were exposed to. An 0.286 correlation coefficient between these two variables was found, which qualifies as a “weak” correlation (0.201–0.400) according to Christmann and Badgett’s (2009) criteria (p. 98). In other words, the correlation between the interest toward a topic and a greater vulnerability toward disinformation on that topic exists, but it is not extremely significant.

Regarding the sociodemographic profile of the respondents, results show a slightly higher score of vulnerability for women (2.99) than men (2.92) though it is statistically significant (using the t-test with a confidence interval of 95.5%). Taking age as a variable in relation to vulnerability, an inversely proportional relationship is observed between both variables: as the respondent’s age increases, vulnerability toward information disorders decrease. The differences in the average results of the respondents aged 55 or younger are significant with respect to the figure of respondents older than that (see Figure 7).

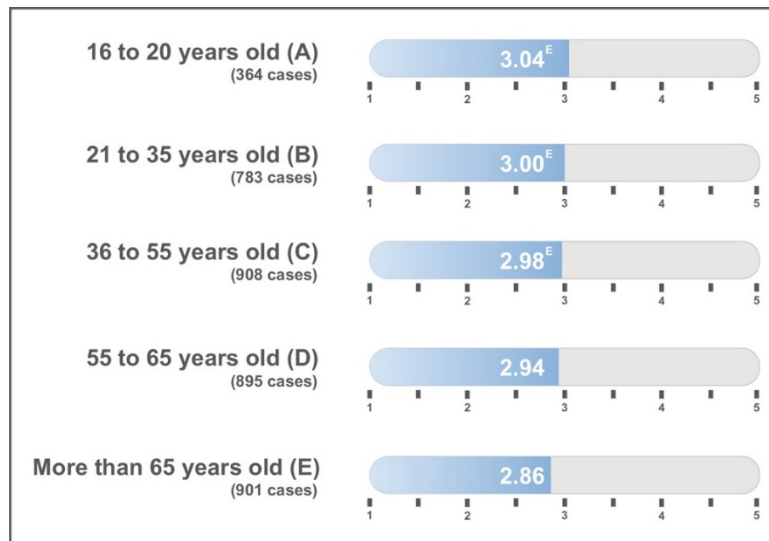


Figure 7. Vulnerability and age.

As for the relation between the level of studies, although it is possible to see a certain trend (not perfect) that suggests that the higher the level of studies is, the lower the degree of vulnerability toward disinformation; the differences between the different segments do not seem statistically significant (see Figure 8).

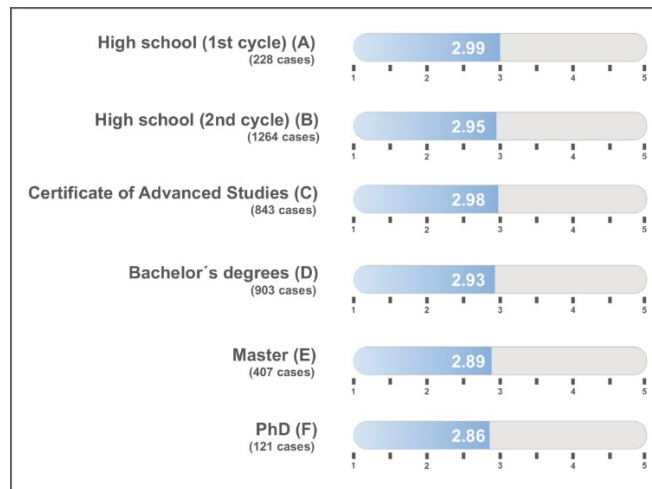


Figure 8. Vulnerability and level of studies.

Regarding the socioeconomic profile of the respondents, a recurring pattern connecting more comfortable economic positions with a lesser impact of information disorders was spotted. This can be seen in the detailed breakdown of vulnerability and per capita income (see Figure 9), which reveals a steady increase of vulnerability for those with lower incomes. Related to this, the more subjective perception of the respondents to the question "how easily do you manage to make it to the end of the month?" was considered, and the results were similar: those who answered "with difficulty" scored 2.99, as opposed to those who said "easily" (2.93) or "very easily" (2.90).

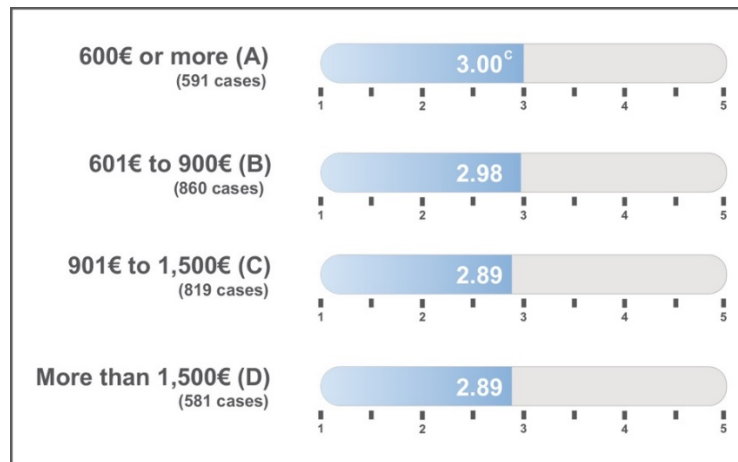


Figure 9. Vulnerability and income level.

The results in the correlation between vulnerability and user profiles on the Internet were also revealing. This was measured through two indicators mainly: the amount of Internet consumption per day and the number of social networks used by the respondent. Both of these indicated a higher degree of vulnerability for those with a more active Internet profile: Vulnerability increased for those who stated spending more than three hours a day for personal use (see Figure 10); also, the more social networks the respondent used, the higher the vulnerability toward information disorders (2.91 for two networks, 2.93 for three, 3.00 for four, and 3.01 for five).

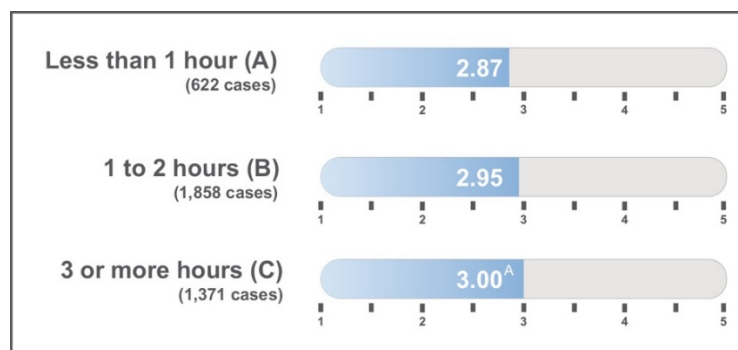
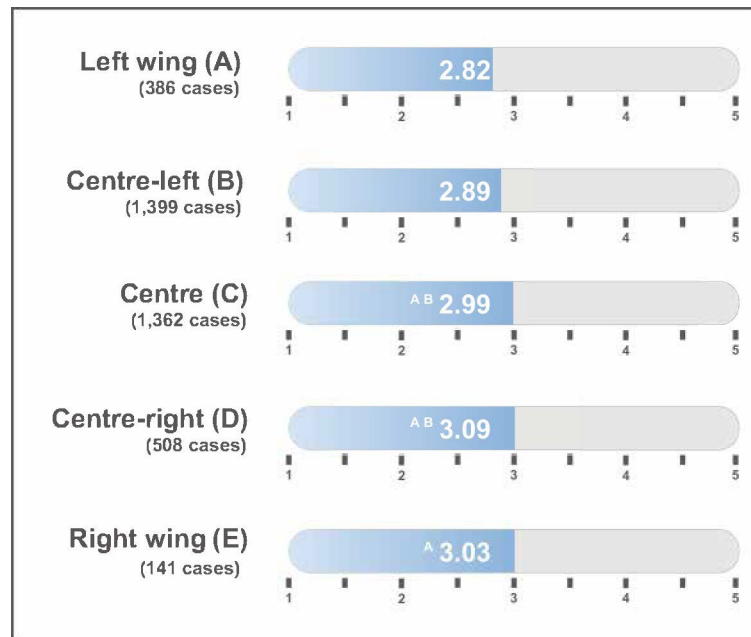


Figure 10. Vulnerability and Internet consumption.

Lastly, the results also showed an interesting correlation between vulnerability and ideological positioning. Generally speaking, the data obtained suggest that those participants who identify their ideology as being closer to right-wing positions on the political spectrum are more vulnerable than those who label themselves as left-wing (see Figure 11). It should be noted, though, that the variable "ideological positioning" lacks the stratified representativeness, unlike the other variables that were measured earlier.



**Figure 11. Vulnerability and ideological positioning.
Multivariate Profiles: Segmentation Tree**

The data presented in previous subsections allude to relationships in different variables that encouraged further exploration. To detect the interactions that occur between these variables and define the multivariate profile, a segmentation analysis with the automatic interaction detection (AID) algorithm was applied.

The AID requires a dependent variable, which in our case was the vulnerability indicator, and a set of independent variables (also referred to as predictor variables). Each variant of the aforescribed dependent variable served to form a different statistical group. The predictor variables used in our analysis were: gender, age, population size, level of studies, work situation, interest in current events, stated media consumption, respondents' self-perception of how-well informed they are, per capita income, self-perception of struggle to get to the end of the month, home status, profiles on social networks, and frequency in the use of the Internet.

The AID algorithm constitutes an application of the analysis of variance (ANOVA) since it seeks to maximize the intergroup variance and minimize the intragroup variance. It uses an *F*-test—in other words, this algorithm seeks to create groups that are the most internally homogeneous but the most different from one another regarding the dependent variable.

This search is done in a sequential way. First, the relationship between each of the predictor variables and the dependent variable is analyzed, selecting the one with the strongest link. More specifically, the statistical relationship between all the possible combinations of the categories of each predictor is

analyzed (though restrictions derived from the use of different measurement units for each variable may apply), selecting those variables and combinations that create the most heterogeneous groups. In this case, the ultimate goal was to spot the most heterogeneous groups to determine vulnerability to fake news.

The same analysis is performed for each targeted group with the rest of the predictor variables, and the process continues until it is no longer possible to segment further and create statistically different groups. The results retrieved in this study after applying this algorithm reveal that:

- **First-level segmentation:** The most influential variable when it comes to determining the vulnerability toward a false story, which segments the sample at a first level, is the ideology/political position of the respondent. Results show that respondents labeling themselves as leaning to the rightward political spectrum are the most vulnerable toward information disorders.
- **Second-level segmentation:** Among the variables that establish statistically significant differences across the groups defined in the first level are the following:
 - Among those leaning to the leftward political spectrum, the profiles on social networks present statistically significant differences: Respondents with three or four profiles on social networks are the most vulnerable (3.10) compared with those with more than four (2.81) and two or fewer (2.63). Thus, it can be affirmed that among those leaning left politically, the bigger their presence on social networks, the greater their predisposition to give more credibility to false content.
 - For respondents labeling themselves as politically center-left, age is a significantly related variable: The younger they are, the more credibility they assign to false content.
 - For those placing themselves in the ideological center, gender is the variable that establishes more significant differences: Women believe false information more than men.
 - For respondents in the center-right and right of the political spectrum, it is the working status that produces more notable segmentations: Those who work (3.19) tend to assign greater trust to disinforming content than those who do not (2.90).
- **Third-level segmentation:** Further segmentation sheds more light on some other sections:
 - On the left of the political spectrum, those with two or fewer profiles on social networks are further segmented by population size of the places where they live. Those living in urban centers of 100,000 inhabitants or less, trust disinformation less (2.42) than those who live in urban centers of more than 100,000 inhabitants (2.81).
 - Those with more than four profiles on social networks can be again segmented by their working status. Those unemployed believe disinformation more (2.98) than those who work (2.63).
 - On the center-left, notable importance among those aged between 21 and 55 is assigned to gender: Women (3.02) believe disinformation significantly more than men (2.86). Also, for those older than 55, population size is significant: Those living in smaller urban centers (100,000 inhabitants or less) trust disinformation more (2.85) than those living in bigger urban areas (2.69).
 - In the political center, further segmentation can only be applied to women. In this case, it is the per capita income in the household variable that makes a significant difference. Women placing themselves in the political center living in households with incomes of less

than 600€ per month per person believe disinformation to a greater extent (3.21) than those living in households with higher incomes (2.96).

- o Respondents in the center-right and right of the political spectrum, those who are unemployed can be further segmented to obtain significant differences considering both respondents' presence on social networks and population size of their urban centers. Unemployed respondents in this section of the political spectrum with two or fewer profiles on social networks are less vulnerable to disinformation (2.73) than those with two or more profiles (3.10). As for those who are employed, the population size of the urban centers where they live becomes a significant variable: Respondents in centers of up to 50,000 inhabitants believe disinformation less (3.04) than those living in bigger cities (3.27).

The final point of interest of the segmentation tree is that it allows to establish segments of respondents and rank them according to their vulnerability. In this way, the most vulnerable respondents would be those from the right or center-right who work and live in municipalities of 50,000 inhabitants or less (3.27), followed by women in the political center who reside in households with lower income (3.21).

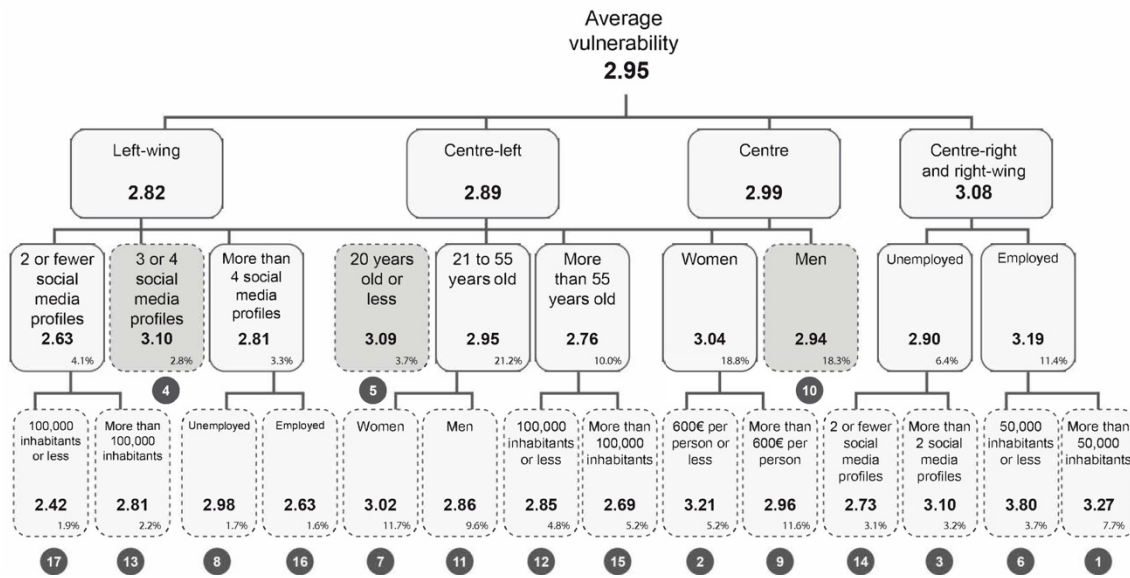


Figure 12. Segmentation tree.

	FIRST SEGMENTATION	SECOND SEGMENTATION	THIRD SEGMENTATION	AVERAGE
1	RIGHT AND CENTRE	EMPLOYED	LIVES IN CITIES OF 50,000 INHABITANTS OR LESS	3.27
2	CENTRE	WOMAN	600€ PER PERSON/MONTH	3.21
3	RIGHT AND CENTRE RIGHT	UNEMPLOYED	MORE THAN 2 SOCIAL MEDIA PROFILES	3.10
4	LEFT-WING	3 OR 4 SOCIAL MEDIA PROFILES		3.10
5	CENTRE-LEFT	20 YEARS OLD OR LESS		3.09
6	RIGHT AND CENTRE RIGHT	EMPLOYED	LIVES IN CITIES OF 50,000 INHABITANTS OR LESS	3.04
7	CENTRE-LEFT	21 TO 55 YEARS OLD	WOMAN	3.02
8	LEFT-WING	MORE THAN 4 SOCIAL MEDIA PROFILES	UNEMPLOYED	2.98
9	CENTRE	WOMAN	MORE THAN 600€ PER PERSON/MONTH	2.96
10	CENTRE	MAN		2.94
11	CENTRE-LEFT	21 TO 55 YEARS OLD	MAN	2.86
12	CENTRE-LEFT	MORE THAN 55 YEARS OLD	LIVES IN CITIES OF 100,000 INHABITANTS OR LESS	2.85
13	LEFT-WING	2 OR FEWER SOCIAL MEDIA PROFILES	LIVES IN CITIES OF MORE THAN 100,000 INHABITANTS	2.81
14	RIGHT AND CENTRE RIGHT	UNEMPLOYED	2 OR FEWER SOCIAL MEDIA PROFILES	2.73
15	CENTRE-LEFT	MORE THAN 55 YEARS OLD	LIVES IN CITIES OF MORE THAN 100,000 INHABITANTS	2.69
16	LEFT-WING	MORE THAN 4 SOCIAL MEDIA PROFILES	EMPLOYED	2.63
17	LEFT-WING	2 OR FEWER SOCIAL MEDIA PROFILES	LIVES IN CITIES OF 100,000 INHABITANTS OR LESS	2.42

Figure 13. Segmentation tree. Final nodes ranked by vulnerability.

The least vulnerable profiles to disinformation would be left-wing respondents with two or fewer profiles on social networks and who reside in cities of 100,000 inhabitants or less (2.42), left-wing respondents who are very active on social networks and who work (2.63), center-left respondents with two or fewer social media profiles and who live in large cities (2.69), and center-right/right respondents who are unemployed and have two or fewer social media profiles (2.69).

Projected Behaviors After Exposing Respondents to Disinformation

As a next step, after analyzing the different degrees of vulnerability to information disorders exhibited by different segments studied, it was relevant to analyze the intended behavior projected by the respondents after being exposed to disinforming content. In other words, an attempt was made to measure not only vulnerability but also the extent to which respondents themselves would contribute to spreading and expanding disinformation. To do this, respondents were asked in the questionnaire about the probability, after being exposed to the made-up stories, of them performing the following actions: retrieving more information by reading the whole story whose headline they had been exposed to, sharing on their social networks, sending the content to their private contacts, and/or commenting on it within their immediate environment.

	Indicator: interest	Indicator: seek more info	Indicator: reposting	Indicator: forward to contacts	Indicator: comment	Indicator: vulnerability
Indicator: interest	1.00					
Indicator: seek more info	0.778	1.00				
Indicator: reposting	0.570	0.542	1.00			
Indicator: forward to contacts	0.620	0.593	0.86	1.00		
Indicator: comment	0.717	0.738	0.625	0.713	1.00	
Indicator: vulnerability	0.286	0.203	0.219	0.234	0.273	1.00

Figure 14. Correlation matrix.

The extent to which these behaviors were interrelated among themselves was subsequently analyzed, and how they interrelate vulnerability to disinformation itself was examined in a later stage. The resulting correlation matrix—using Pearson correlation coefficient—shed more light on the variables that were more likely to happen concurrently (see Figure 14).

Correlation data show that interest in the content that respondents were exposed to is strongly related to the likelihood of this content being disseminated: For the three cases of dissemination considered (publication on the respondents’ social networks, sending the content to their private contacts, or commenting on it within their immediate environment) the correlation coefficient is always significant (0.570–0.717). Correlation is even stronger between the projected action of sharing content on social

networks and sending it to private contacts (0.860): Those who decide to repost content on their social networks are highly likely to do so too through their private contacts and, in general, through all the channels at their disposal (as proved too by the 0.625 co-occurrence of dissemination through social networks and comments in the respondents' immediate environment). The intention behind the decision of reposting or forwarding content was, however, not measured and needs further exploration to determine whether looking for external opinions or, simply, indicating to others that such information is not true are predominant motives behind this significant behavior.

Discussion and Conclusion

The present study focused on the study of the effects that information disorders have on the Spanish population and, ultimately, aimed at contributing to the debate around the nature of disinformation itself. To do this, the research has produced evidence to test, firstly, the widespread nature of disinformation alleged in the main hypothesis. The results of the investigation have also shed further light on the existence of targeted groups that could be labeled as being particularly vulnerable to information disorders, as noted in the secondary hypotheses presented at the beginning of this study.

The validation of the main hypothesis can be justified by the results of the quantitative analysis, which prove that more than half of the respondents of our comprehensive and representative sample displayed a significant degree of vulnerability toward disinformation. This presents information disorders in a new problematic light, since it should not only be regarded as a topic of concern for specific targeted groups only, but also—as has been proved in the present research—as a phenomenon looming over the majority of the population of the country.

Our (subconscious or not) imagery can keep picturing information disorders as a problem that affect certain individuals. The results from our quasi-experimental survey reveal, however, that informative disorders affect not only those who are particularly prone to suffer from it. Disinformation, at least as proved in this comprehensive study of the current situation in Spain, is a generalized problem.

Our interest in Spain as a case study is open to be extended and completed by further empirical research that tests whether this is an isolated case or, as suspected, a generalized phenomenon triggered by a number of factors, among which the proliferation of new media outlets that have emerged in a rapidly changing digital environment stands out as a very probable cause—though not the only one.

Further research can also widen the scope of several correlations that have been established in our study. Data that confirm that certain sectors of the population are particularly vulnerable to disinformation have been provided: namely, younger age groups, citizens with lesser levels of education, and those living in households with lower income—as suggested in our secondary hypotheses.

The preliminary qualitative stage of our investigation suggested further interrelations between vulnerability to disinformation and a number of variables that had not been considered in the hypotheses. As a result of this, our analysis covered not only the hypotheses that we aimed to test initially, but also correlations with other variables such as the level of Internet consumption, the ideological positioning of respondents, or

how well-informed respondents considered themselves to be. None of these three variables were proportionally represented in the original segments configured for the sample studied, which undermines, to a certain extent, the representativeness of these sections of data. However, the highly representative sample size still applies to them, so the results obtained for these items are still highly valuable. Thus, greater Internet consumption has been proved to be related to a higher vulnerability to information disorders; it is the same for greater information consumption. The present research did not take into consideration, though, and this could also well be a future line of research, the extent to which the consumption of other media other than the Internet can also be related to greater or lesser proneness to be impacted by disinformation.

The last item assessed from this slightly less representative approach was the ideological positioning, and results suggested that the further right the respondents placed themselves on the political spectrum, the more vulnerable they were to information disorders. Differences among milestones on the political spectrum were so significant that, when the AID algorithm was applied to provide a more detailed look at vulnerability spots, ideology emerged as the most influential variable—hence, the one that determined the first-level segmentation. As for political preferences, our findings suggest that the links between the respondents' political leaning and their vulnerability to information disorders are worth exploring in more depth, and with a purposefully stratified sample to consider this specific variable so the results can be extrapolated with more soundness. Also, since the results in this category rely on self-reported data (self-perception, in the end), further ways to systematize the study of this variable can be thought of to pursue even more replicable approaches.

Subsequent segmentation conducted in our research aimed at shedding more light on specific niches where information disorders can benefit from more vulnerable audiences, in the belief that targeted actions, as announced in the abstract of this investigation, are key to lessening the effects of distorting content.

If the first part of our article referenced several authors who warned that technology had a potential to disseminate disinformation, it may be also time to remind ourselves that it can highly reduce its spreading. Commitments like the self-regulatory Code of Practice on Disinformation launched by the European Commission in 2018, which involved relevant parties such as Facebook, Google, Twitter, Mozilla, Tik-Tok or the advertising industry, hint that this may be a much more hopeful—and productive—way. Since some of these big technological platforms are frequently associated to efforts that go in the harmful direction—from the spread of disinformation up to the discredit of the democratic institutions (Bradshaw & Howard, 2019, p. 21)—a change in this tide does not look like a minor aspiration.

This presents contemporary societies with relevant challenges, both theoretically and practically. In the theoretical framework, the need for society to be well informed to strengthen democracy is proposed; however, what the results of this research confirm is the opposite: Disinformation already threatens more than half of the Spanish population. Therefore, this is a phenomenon that can be considered widespread and one that also represents a highlighted threat for specific groups that have been identified as particularly vulnerable. The practical implications of this are also evident: The need to act and lessen the effects of disinformation is more necessary than ever.

In this respect, two lines of action that can be particularly valuable are suggested: One in the academia and the other one in the industry. It is obvious that the different platforms of social networks, businesses as they are, have their own policies to provide access to information (or disinformation). Hence, they hold direct responsibility by their actions or their omissions. Without endangering the intellectual property rights on the algorithms of data mining, it is important to consider a collaborative framework between the media industry, the social networks, and the academic community to increase the transparency in this aspect through experiments with the Application Programming Interface (API) and data sets of each platform in open innovation environments.

As for the efforts of universities, the success of the academic role in lessening the effects of information disorders lies in the promotion of scholarships to help researchers who specialize in the field of disinformation to work both in the main national and international academic centers and with the main technological companies to try and build synergic solutions that stem from independent research and corporate support, which is consonant with Chen, Kearney, and Chang's (2021) conclusion that "effective training programs may be required for literacy education to combat false news" (p. 1277). Also, establishing a calendar of national and international activities that represent a meeting point where researchers interested in the effects of disinformation share the results of their investigations and their updated proposals to fight disinformation would be desirable. It would be necessary, in short, for both universities and technological companies to combine efforts so that these activities are frequent enough and the success of tackling this problem does not depend on sporadic and nonsystematic efforts.

References

- Abrahams, A., & Leber, A. (2021). Electronic armies or cyber knights? The sources of pro-authoritarian discourse on Middle East Twitter. *International Journal of Communication, 15*, 1173–1199.
- Amazeen, M. A., & Bucy, E. P. (2019). Conferring resistance to digital disinformation: The inoculating influence of procedural news knowledge. *Journal of Broadcasting & Electronic Media, 63*(3), 415–432. doi:10.1080/08838151.2019.1653101
- Amazeen, M. A., Thorson, E., Muddiman, A., & Graves, L. (2018). Correcting political and consumer misperceptions: The effectiveness and effects of rating scale versus contextual correction formats. *Journalism & Mass Communication Quarterly, 95*(1), 28–48. doi:10.1177/1077699016678186
- Andersen, J., & S e, S. O. (2020). Communicative actions we live by: The problem with fact-checking, tagging or flagging fake news—the case of Facebook. *European Journal of Communication, 35*(2), 126–139. doi:10.1177/0267323119894489
- Bakir, V., & McStay, A. (2018). Fake news and the economy of emotions: Problems, causes, solutions. *Digital Journalism, 6*(2), 154–175. doi:10.1080/21670811.2017.1345645

- Beck, U. (1992). *Risk society: Towards a new modernity*. London, UK: SAGE Publications.
- Bennett, W. L., & Livingston, S. (2018). The disinformation order: Disruptive communication and the decline of democratic institutions. *European Journal of Communication, 33*(2), 122–139. doi:10.1177/0267323118760317
- Bradshaw, S., & Howard, P. N. (2019). *The global disinformation disorder: 2019 Global inventory of organised social media manipulation* (Working Paper 2019.2). Oxford, UK: Project on Computational Propaganda. Retrieved from <https://demtech.oii.ox.ac.uk/wp-content/uploads/sites/93/2019/09/CyberTroop-Report19.pdf>
- Brosius, A., van Elsas, E. J., & de Vreese, C. H. (2019). Trust in the European Union: Effects of the information environment. *European Journal of Communication, 34*(1), 57–73. doi:10.1177/0267323118810843
- Buchanan, T. (2020). Why do people spread false information online? The effects of message and viewer characteristics on self-reported likelihood of sharing social media disinformation. *PLoS ONE, 15*(10), 1–33. doi:10.1371/journal.pone.02396
- Chen, C. Y., Kearney, M., & Chang, S. L. (2021). Belief in or identification of false news according to the elaboration likelihood model. *International Journal of Communication, 15*, 1263–1285.
- Christmann, E. P., & Badgett, J. L. (2009). *Interpreting assessment data: Statistical techniques you can use*. Arlington, VA: NSTA.
- Collado, Z. C., Basco, A. J. M., & Sison, A. A. (2020). Falling victims to online disinformation among young Filipino people: Is human mind to blame? *Cognition, Brain, Behavior: An Interdisciplinary Journal, XXIV*(2), 75–91. doi:10.24193/cbb.2020.24.05
- European Commission. (2018a, April 30). *A multi-dimensional approach to disinformation: Report of the independent High Level Group on fake news and online disinformation*. Retrieved from <https://data.europa.eu/doi/10.2759/739290>
- European Commission. (2018b, April 28). *Tackling online disinformation: A European approach*. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM(2018) 236 final. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52018DC0236&rid=6>
- Ferrara, E. (2017). Measuring social spam and the effect of bots on information diffusion in social media. In S. Lehmann & Y. Ahn (Eds.), *Complex spreading phenomena in social systems* (pp. 229–255). Cham, Switzerland: Springer.

- Figueira, J., & Santos, S. (2019). Percepción de las noticias falsas en universitarios de Portugal: Análisis de su consumo y actitudes [Perceptions about fake news in Portuguese higher education students: An analysis of consumption and attitudes]. *El Profesional de la Información*, 28(3), 1–16. doi:10.3145/epi.2019.may.15
- Howell, W. L. (2013). *Digital wildfires in a hyperconnected world*. Retrieved from <http://reports.weforum.org/global-risks-2013/risk-case-1/digital-wildfires-in-a-hyperconnected-world/>
- Kelly, D. (2019). Evaluating the news: (Mis)perceptions of objectivity and credibility. *Political Behavior*, 41(2), 445–471. doi:10.1007/s11109-018-9458-4
- Klyueva, A. (2019). Trolls, bots, and whatnots: Deceptive content, deception detection, and deception suppression. In I. E. Chiluba & S. A. Samoilenko (Eds.), *Deception, fake news, and misinformation online* (pp. 18–32). Hershey, PA: IGI Global.
- Kovach, B., & Rosenstiel, T. (2007). *The elements of journalism: What newspeople should know and the public should expect*. New York, NY: Three Rivers.
- Latour, B. (2005). *Reassembling the social: An introduction to Actor-Network-Theory*. Oxford, UK: Oxford University Press.
- Lewis-Beck, M., Bryman, A. E., & Futing Liao, T. (2004). *The SAGE encyclopedia of social science research methods*. London, UK: SAGE Publications.
- Macnamara, J. (2018). Public relations and post-communication. Addressing a paradox in public communication. *Public Relations Journal*, 11(3), 1–20.
- Magallón-Rosa, R. (2018). La biblioteca digital sobre Donald Trump. Fact-checking frente a fake news [The digital library on Donald Trump. Fact-checking against fake news]. *Estudios Sobre El Mensaje Periodístico*, 24(1), 273–282. doi:10.5209/ESMP.59949
- McGrew, S., Breakstone, J., Ortega, T., Smith, M., & Wineburg, S. (2018). Can students evaluate online sources? Learning from assessments of civic online reasoning. *Theory & Research in Social Education*, 46(2), 165–193. doi:10.1080/00933104.2017.1416320
- Monnier, A. (2018). Narratives of the fake news debate in France. *IAFOR Journal of Arts & Humanities*, 5(2), 3–22. doi:10.22492/ijah.5.2.01
- Monteiro, P., & Rampazzo, R. (2019). The role of beliefs and behavior on Facebook: A semiotic approach to algorithms, fake news, and transmedia journalism. *International Journal of Communication*, 13, 603–618.

- Nemr, C., & Gangware, W. (2019, March 19). *Weapons of mass distraction: Foreign state-sponsored disinformation in the digital age*. Retrieved from <https://www.state.gov/wp-content/uploads/2019/05/Weapons-of-Mass-Distraction-Foreign-State-Sponsored-Disinformation-in-the-Digital-Age.pdf>
- Nielsen, R. K., & Graves, L. (2017, October). "News you don't believe": Audience perspectives on fake news. Retrieved from https://reutersinstitute.politics.ox.ac.uk/sites/default/files/2017-10/Nielsen%26Graves_factsheet_1710v3_FINAL_download.pdf
- Rivas Troitiño, J. M. (1995). Desinformación: Revisión de su significado. Del engaño a la falta de rigor [Disinformation: A review of its meaning. From deceit to lack of rigor]. *Estudios Sobre el Mensaje Periodístico*, 2, 75–83. Retrieved from <https://revistas.ucm.es/index.php/ESMP/article/view/ESMP9595110075A>
- Seo, H., & Faris, R. (2021). Special section on comparative approaches to mis/disinformation—Introduction. *International Journal of Communication*, 15, 1165–1172.
- Shao, C., Ciampaglia, G. L., Varol, O., Yang, K. C., Flammini, A., & Menczer, F. (2018). The spread of low-credibility content by social bots. *Nature Communications*, 9(1), 1–9. doi:10.1038/s41467-018-06930-7
- Stetka, V., Surowiec, P., & Mazák, J. (2019). Facebook as an instrument of election campaigning and voters' engagement: Comparing Czechia and Poland. *European Journal of Communication*, 34(2), 121–141. doi:10.1177/0267323118810884
- United Nations Educational, Scientific and Cultural Organization. (2018). *Journalism, fake news & disinformation. Handbook for journalism education and training*. Paris, France: UNESCO. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000265552>
- Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science*, 359(6380), 1146–1151. doi:10.1126/science.aap9559
- Wardle, C., & Derakhshan, H. (2017, September 17). *Information disorder. Toward an interdisciplinary framework for research and policymaking*. Council of Europe Report. Retrieved from <https://rm.coe.int/information-disorder-%20report-november-2017/1680764666>
- Wenzel, A. (2019). To verify or to disengage: Coping with "fake news" and ambiguity. *International Journal of Communication*, 13, 1977–1995.
- Yadlin, A., & Shagrir, O. K. (2021). "One big fake news": Misinformation at the intersection of user-based and legacy media. *International Journal of Communication*, 15, 2528–2546.