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Perception of home teleworking during COVID-19 crisis in Spain: significant factors and assymetrical influence on acceptance and resistance

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Abstract

Purpose – This paper aims to shed light on the perception of the consequences of implementing home teleworking (TW) for employers and employees amid the pandemic. By doing so, the research analyzes the factors that explain employers' and employees' perceptions of home TW and the symmetry of their impact on its acceptance and rejection.

Design/methodology/approach – The analysis is done over the survey "Trends in the digital society during SARS-COV-2 crisis in Spain" by the Spanish "Centro de Investigaciones Sociológicas." The explanatory variables were selected and classified using the well-known taxonomy of Baruch and Nicholson (i.e. individual factors, family/home, organizational and job-related).

Findings – The global judgment of HTW is positive, but factors such as gender, age, children in care or being an employer nuance that perception. While some factors, such as the attitude of employees toward information communication technologies (ICTs), perceived productivity or the distance from home to work, have a significant link with both positive and negative perceptions of HTW, other factors can only explain either positive or negative perceptions. Likewise, the authors observed that being female and having children on care had a detrimental influence on opinions about HTW.

Practical implications – A clearer regulation of TW is needed to prevent imbalances in rights and obligations between companies and employees. The authors also highlight the potentially favorable effects of telecommuting on mitigating depopulation in rural areas.

Originality/value – The authors have also measured not only the significance of assessed factors on the overall judgment of HTW for firms and workers but also whether these factors impact acceptance and resistance attitudes toward TW symmetrically.

Keywords Teleworking, Home teleworking, COVID-19 pandemic, Asymmetrical influence, Spanish labor market

Paper type Research paper

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1. Introduction

The positive outcomes of teleworking (TW) and the energy crisis in the 1970s led academics to predict its generalized adoption and implementation in homes over decades (Elldér, 2019). However, this occurrence did not take place either at the onset of the 21st century or until the spring of 2020 (Fana *et al.*, 2020). In fact, the development of home TW (HTW) showed significant variability across countries until March 2020 (Gschwind and Vargas, 2019). Anglo-Saxon and Nordic countries achieved greater development in TW than European southern states such as Spain or France (Aguilera *et al.*, 2016; Gschwind and Vargas, 2019).

This panorama suddenly changed because of the emergency caused by COVID-19. In Spain, the government approved a set of employment-related dispositions through Royal Decree-Law 8/2020 on March 17 (Corral and Isusi, 2020). Similar measures have been implemented in many other countries (Tavares *et al.*, 2021; Donati *et al.*, 2021; Vargas-Llave *et al.*, 2022). Thus, from 2020 to 2021, many Spanish citizens used services implemented by information communication technologies (ICTs), and practically all workers whose jobs were adaptable to HTW used them.

Telework in the COVID-19 crisis displayed particular characteristics. First, it was conducted from home and launched without previous planning (Belzunegui and Erro-Garcés, 2020). Second, because schools were closed, it was challenging to balance work and family obligations with children at home (Di Domenico *et al.*, 2020; Fana *et al.*, 2020). Third, companies did not have the necessary technological resources to address the difficulties associated with working remotely (Belzunegui and Erro-Garcés, 2020). Finally, employees often contribute to technological infrastructure (Abulibdeh, 2020).

In the implementation of TW, various concerns merit consideration. For instance, the issue of work–life balance can be affected if clear differentiation between personal and professional domains is not established (Tavares *et al.*, 2021; Erro-Garcés *et al.*, 2022; Magnier-Watanabe *et al.*, 2022), and job satisfaction might drop if workers are unsure of how their managers are evaluating them. The TW "boom" and the pandemic's unique characteristics justify the relevance of this study since lockdowns across the world due to the COVID-19 crisis could be understood as a natural experiment that will state the actual limits of adopting HTW (Tokarchuk *et al.*, 2021). Accordingly, the present paper aims to shed some light on the perception of the consequences of implementing HTW for both employers and employees. To do so, we use a survey by the Spanish Government Agency *Centro de Investigaciones Sociológicas* (Research Centre of Sociology, CIS) "Trends in the digital society during SARS-COV-2 crisis in Spain" that was complained about in March 2021.

This paper is focused on the following two research objectives (RO):

RO1. Assessing the factors that influence the judgment about the impact of HTW on firms and on employees in Spain.

We select variables to evaluate with the classical taxonomy by Baruch and Nicholson (1997), who differentiate individual, family/home, organizational and job-related factors. The perceptions of the influence of HTW on employers and workers are, of course, different output variables; therefore, to answer this question, we run two separate regression analyses on the judgment of HTW.

RO2. Stating if the assessed factors impact acceptance and resistance toward HTW symmetrically.

The factors that lead to the acceptance of a new technology are not necessarily the same as those that induce rejection (Gauttier, 2019). For example, a common finding in the literature on telecommuting is that the distance to the work center positively impacts workers' adherence to HTW (Malik *et al.*, 2016). However, the literature does not analyze whether this fact is because workers living far from work centers have a positive perception of HTW and workers living close to them tend to have reluctance; on the other hand, this finding is

strictly because of an average positive perception of HTW by workers who need a long commute to the workplace. While in the first case, the distance to work symmetrically explains acceptance and resistance toward HTW; in the second hypothesis, the distance to workplace asymmetrically impacts acceptance and resistance. To conduct this analysis, we separately regress the influence of assessed factors on positive and negative judgments of HTW, and of course, we run a disjoint evaluation for firms and employees.

The remainder of the article is organized as follows. The next section presents the theoretical framework. Section 3 describes the data and methodology, and Section 4 presents the methods used to conduct the empirical analysis. Section 5 includes the main results, whereas Section 6 develops a discussion from the previous results. Finally, Section 7 describes the main conclusions of the paper.

2. Theoretical background

The advantages and drawbacks of TW depend on a wide deal of variables that have been extensively studied and empirically tested (Beauregard *et al.*, 2019). Baruch and Nicholson (1997) classified these factors into individual circumstances, family/home factors, organizational culture and the nature of the job. As in Baruch and Nicholson (1997), we are interested in the influence of these variables on the perception of the advantages that adopting HTW provides for both workers and firms. These four categories underlie home–computer interaction issues (Fisher *et al.*, 2021). Thus, the study of the factors influencing attitudes toward HTW, although not always, can often be focused on as an assessment of the acceptance of ICTs, and thus, the use of the Technology Acceptance Model (TAM) by Davis (1989), despite having some limitations (Zahid *et al.*, 2013), is usually very helpful (Pérez-Morote *et al.*, 2021). The reason is that TAM allows for explaining the influence of any factor on telecommuting judgment by using reasonable arguments linked to usefulness and/or easiness expectations. Whereas Pérez Pérez *et al.* (2004) and Silva-C *et al.* (2019) applied TAM to model the adoption of telecommuting by organizations, Donati *et al.* (2021) did so from the employees' perspective, and Ollo-López *et al.* (2021) provided a broader vision that embedded individual, organizational and social perspectives. In the following, we expose the factors used in this paper to explain judgment over the impact of working from home.

2.1 Individual factors

Workers' gender is a recurrent individual explanatory variable. Mainstream findings outline that TW practitioners are linked to being male (Sener and Bhat, 2011; Fisher *et al.*, 2021), but females are often more receptive to HTW arrangements (Malik *et al.*, 2016; Raišienė *et al.*, 2020; Astroza *et al.*, 2020). A common explanation is that home care is traditionally linked to women, and HTW allows for balancing household and work duties. This advantage stands for workers but also for firms since absenteeism due to personal issues diminishes. Therefore, the following hypotheses are proposed:

H1.1. Women perceive more advantages of HTW for firms than men.

H1.2. Women perceive more advantages of HTW for workers than men.

Although telecommuting is generally performed by senior workers (Gschund and Vargas, 2019), the literature usually reports that lower ages and positive attitudes toward TW are linked because the ability to use ICTs is greater in persons of lower ages (Malik *et al.*, 2016; Nguyen, 2021; Raišienė *et al.*, 2020). Raišiene *et al.* (2021) outline that while members of baby boomers value face-to-face interactions and tend to feel telecommuted activities as useless, people of the X-generation have greater appreciation for independence and flexibility. Likewise, the millennial generation is the first digital-born generation. In this regard, López-Igual and Rodríguez-Modroño (2020) outlined greater adherence to HTW at ages corresponding to that of X-generation. Therefore:

H2.1. Members of the X-generation perceive more advantages of HTW for firms than baby boomers.

H2.2. Members of the X-generation perceive more advantages of HTW for workers than baby boomers.

Several papers have outlined a positive correlation between high social status and favorable perceptions of HTW. Members of higher social status develop jobs that are well suited to ICTs (Elldér, 2019; Asgari *et al.*, 2022). Therefore, it is logical to suppose that they perceive with greater intensity the potential benefits of HTW for employers and employees. Therefore, the following hypotheses are proposed:

H3.1. High social status is linked with a positive perception about the influence of HTW on firms.

H3.2. High social status is linked with a positive perception about the influence of HTW on workers.

Being more likely to use ICTs has been found to be significant because it enables the perception of usefulness of ICTs for workers and firms and increases the ease expectation of HTW (Donati *et al.*, 2021; Fischer *et al.*, 2021; Asgari *et al.*, 2022). Thus, we propose the following hypotheses:

H4.1. Having the habit of using ICTs in daily life is linked with a positive perception about the influence of HTW on firms.

H4.2. Having the habit of using ICTs in daily life is linked with a positive perception about the influence of HTW on workers.

2.2 Family/home factors

A relevant issue within home/family factors is having an adequate infrastructure in the home to develop HTW. This implies having sufficient ICT resources (Elldér, 2019) since a great concern for workers is having problems in getting firms' resources to develop tasks (Nguyen, 2021). Of course, worse workers' performance damages firms' productivity; thus, the following hypotheses are proposed:

H5.1. Having adequate ICT resources is linked with a positive perception about the influence of HTW on firms.

H5.2. Having adequate ICT resources is linked with a positive perception about the influence of HTW on workers.

The distance from home to the workplace is often reported as a relevant issue (Malik *et al.*, 2016; Ton *et al.*, 2022). Therefore, HTW is more accepted by people living outside the center of cities, which are usually located in administrative centers (Moens *et al.*, 2022). Likewise, avoiding the cost of workers' commuting must also benefit companies that diminish business expenses and effort associated with this heading. Therefore, the following hypotheses are formulated:

H6.1. The distance to the workplace is linked with a positive perception about the influence of HTW on firms.

H6.2. The distance to the workplace is linked with a positive perception of the influence of HTW on workers.

Another key variable tied to family is the number of children in households (López-Igual and Rodríguez-Modroño, 2020; Ollo-López *et al.*, 2021; Asgari *et al.*, 2022). HTW is commonly used by workers with dependent children, since theoretically, their presence increases family

duties, and thus, the balance between work and home obligations becomes more necessary (Beauregard *et al.*, 2019). From the firms' perspective, the employee's absenteeism with children may increase if work must be done at the work center, and thus, working from home in many cases solves this drawback. It seems logical to state the following hypothesis:

H7.1. Having child to care is linked with a positive perception about the influence of HTW on firms.

H7.2. Having child to care is linked with a positive perception about the influence of HTW on workers.

2.3 Organizational culture

A recurrent reason explaining the low spread of working from home before March 2020 is the reluctance of employers to allow telecommuting (Gschwind and Vargas, 2019) due to issues such as problems in coordinating operations or difficulty in controlling and monitoring workers' performance (Beauregard *et al.*, 2019). Likewise, adopting TW requires companies to make several changes that require significant effort or that could be perceived as impossible to implement (Aguilera *et al.*, 2016). From the employer's perspective, HTW may also have negative effects on employees since that arrangement makes it difficult to take care of their safety and health and could make workers less visible (De Andrés-Sánchez *et al.*, 2023). Therefore, the following hypotheses are proposed:

H8.1. Being an employer is linked with a negative perception about the influence of HTW on firms.

H8.2. Being an employer is linked with a negative perception about the influence of HTW on workers.

The alleged advantages of TW for firms depend on their economic activity (Baruch and Nicholson, 1997). Therefore, employers' attitudes toward telecommuting rely on the perceived benefits of that work arrangement (Tokarchuck *et al.*, 2021). Organizational commitment to TW should have a positive impact on the perceived job performance of the ICTs used in its implementation, thereby influencing the perceived usefulness of these tools (Venkatesh and Davis, 2000). Moreover, this organizational support for home TW should also positively affect the usability of ICTs in job execution, having a positive link with ease of use of the evaluated practices (Venkatesh and Bala, 2008).

In addition, Belzunegui-Eraso and Erro-Garcés (2020) consider that behavior managers can foster telework or act as a barrier to the implementation of this modality of work, thus affecting the effort expectancy of telecommuting practice and impacting their judgment about HTW. As far as workers are concerned, they present a greater acceptance of telework if they internalize telecommuting in their culture (Martínez-Sánchez *et al.*, 2007) and perceive firm support (Park and Cho, 2022). Telework implies a new way of organizing work (Belzunegui-Eraso and Erro-Garcés, 2020) and affects the measures used in the control of performance. As a result, organizational culture is also affected (Martínez-Sánchez *et al.*, 2007). Additionally, trust in management positively impacts employees' productivity if working remotely (Jaiswal *et al.*, 2022). Thus, these facts will improve firms' performance (Martínez-Sánchez *et al.*, 2007) and allow us to state the following hypotheses:

H9.1. Being a member of an organization committed to telecommuting is linked with a positive perception of the influence of HTW on firms.

H9.2. Being a member of an organization committed to telecommuting is linked with a positive perception of the influence of HTW on workers.

2.4 The nature of the job

The suitability of HTW depends on the type of job in such a way that one of the main empirical determinants of its acceptance is perceived productivity (Malik *et al.*, 2016; Houghton *et al.*, 2018). Greater productivity implies not only a benefit for the corporation but also greater well-being for the employee (MaillotAnne-Sophie *et al.*, 2022). Therefore, the following hypotheses are proposed:

H10.1. Perceiving that working from home allows for attaining greater productivity is linked with a positive perception of the influence of HTW on firms.

H10.2. Perceiving that working from home allows for attaining greater productivity is linked with a positive perception of the influence of HTW on workers.

A job must attain several conditions to be fully adaptable to telecommuting, such as being cerebral rather than manual or having a high degree of autonomy (Baruch and Nicholson, 1997). This finding elucidates why individuals with higher academic levels, who typically engage in intellectual tasks (Nguyen, 2021), certain types of managers and professionals (López-Igual and Rodríguez-Modroño, 2020), and public sector employees (Ollo-López *et al.*, 2021), tend to exhibit a higher degree of acceptance of telecommuting. Of course, the organizations that may take more advantage of HTW are those in which a great proportion of employees have a job that is naturally adapted to be implemented remotely. Therefore, the following hypotheses are proposed:

H11.1. Having a job fully adaptable to working from home is linked with a positive perception of the influence of HTW on firms.

H11.2. Having a job fully adaptable to working from home is linked with a positive perception about the influence of HTW on workers.

2.5 Theoretical underpinnings

Once individual, family/home factors, organizational factors and job factors have been presented, we describe our theoretical model to explain employers' and employees' perceptions of HTW and the symmetry of their impact on its acceptance and rejection.

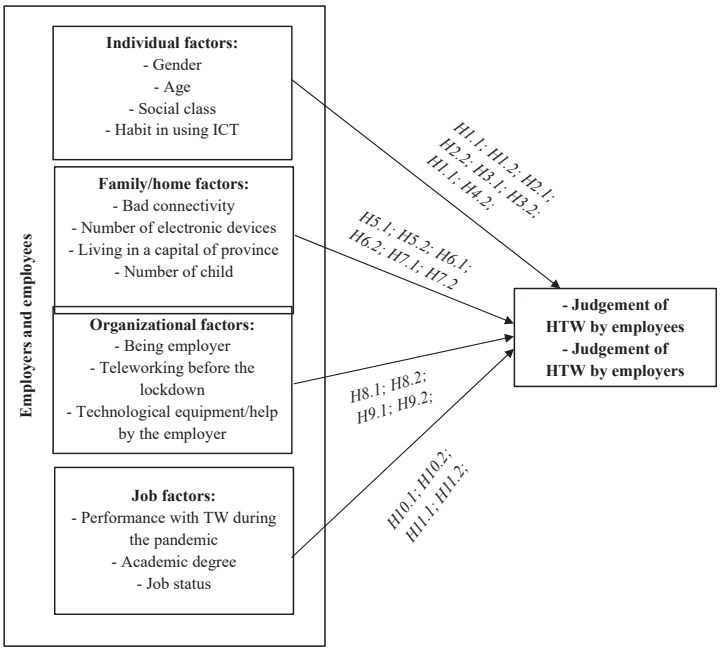
Figure 1 shows the relationship between HTW on workers and firms and the described factors. The previously presented hypotheses are also included in this model.

3. Materials

This assessment is grounded in the survey by the "Centro de Investigaciones Sociológicas" (CIS) (Research Centre on Sociology) displayed in CIS (2021). It was carried out in March 2021 in Spain, one year after the first (and principal) lockdown due to the COVID-19 pandemic. The whole questionnaire is displayed in CIS (2021). Surveys by CIS are commonly agreed upon as a reference to develop an analysis of Spanish social issues (Cea D'Ancona, 2022). For example, a simple search on the SCOPUS database "Centro de Investigaciones Sociológicas" AND "survey" provides more than 30 papers based on their samples. Similar results are obtained by performing this search in WoS.

This survey has been developed by stratifying the population according to sex, age, region and size of the town where the person surveyed resides in such a way that it can be considered a representative of the whole Spanish population. With regard to sampling error, for a two sigma confidence level, it was ±1.8% under the hypothesis of simple random sampling (CIS, 2021).

According to Table 1, the whole survey encompassed a total of 3,014 responses, with 51.7% of the respondents identifying as female and 48.3% as male. We constrained our



Source(s): Own elaboration

Figure 1.
Theoretical model: employers' and employees' perception of home teleworking and the symmetry of their impact on its acceptance and rejection

Base sample (N = 3,014)		Active working population (N = 1739)	
Women	1557 (51.7%)	Women	845(48.6%)
Men	1457 (48.3%)	Men	894 (51.4%)
Situation in the labor market	*N*	*Labor Situation*	*N*
Worker (overall)	1155 (38.3%)	Worker (overall)	1155 (66.4%)
		Worker (private)	956 (55%)
		Worker (public)	199 (11.4%)
Employer/Entrepreneur	250 (8.3%)	Employer/Entrepreneur	250 (14.4%)
Other situations within the active population	374 (12.4%)	Other situations within active population	374 (21.5%)
		Record of temporary employment regulation	50 (2.9%)
		Unemployed	281 (16.2%)
		Sick leave	43 (2.5%)
Nonactive population	1230 (40.8%)		

Source(s): Own elaboration from data from CIS (2021)

Table 1.
Gender distribution and occupational status within the sample and subsample used in this study

analysis to the active working population (57.75% of the base sample), and consequently, the final sample had 1,739 answers that in any case, we can consider good sized (Conroy, 2016).

Tables 2 and 3 provide an overview of the questions utilized to quantify the explanatory factors discussed in Section 2, as well as the explained factors that model the perception of the

OQ1 = Overall evaluation of telework for firms	*OQ2 = Overall evaluation of telecommuting for employees*
Good (67.78%)	Good (54.49%)
Neutral/no evaluation (22.70%)	Neutral/no evaluation (27.06%)
Bad (9.52%)	Bad (18.45%)
OQ3 = Positive effects of teleworking for firms	*OQ4 = Detrimental effects of teleworking for firms*
Increases productivity (35.02%)	Harms teamwork (4.25%)
Reduces costs (45.99%)	Harms the firms' internal cohesion (3.17%)
Avoids displacement (41.64%)	Nullifies the pride of belonging to the company (1.67%)
Facilitates family conciliation (5.43%)	Very difficult to control (4.25%)
Avoids infections and absenteeism (1.72%)	Isolates people (5.81%)
Allows companies to continue working (2.31%)	Jobs are lost (0.48%)
What is good for the worker is good for the company (3.77%)	Loss of quality in the service (1.34%)
Other (1.08%)	Other (1.94%)
At least one item (67.08%)	At least one item (9.47%)
OQ5 = Positive effects of teleworking for employees	*OQ6 = Detrimental effects of teleworking on employees*
The employees are the owners of their time (35.66%)	Encourages isolation (9.84%)
It avoids commuting (42.93%)	Increases stress (11.57%)
It favors family conciliation (42.07%)	Difficult to disconnect from work during break times (12.48%)
It increases productivity (1.34%)	More work volume (0.48%)
Costs are saved (0.75%)	It leads to health problems (0.70%)
For convenience (1.45%)	Decreases productivity (0.70%)
There is more flexibility (0.75%)	Job losses, wage cuts (0.48%)
For health safety (0.65%)	More expenses (0.43%)
For being a different way of working (0.65%)	It makes it difficult to reconcile family (0.65%)
There is no loss of work (0.38%)	Other (0.16%)
Other (0.32%)	At least one item (18.07%)
At least one item (54.49%)	

Source(s): Own elaboration from data in CIS (2021)

Table 2. Questions and responses on explained factors by active labor people in the survey used in this paper

impact of working from home on organizations and employees. Whereas items used to build up input factors are denoted as IQX (input question number X), the answers measuring the acceptance/rejection of HTW are denoted as OQX (the Xth question linked to output variables). The age of respondents (IQ2) presented by generation: baby boomers (20.36%), X-generation (57.39%), and millennials and others (22.55%).

The mainstream opinion about HTW is closer to its acceptance than to its rejection. In the questions about the suitability of HTW for firms, whereas in OQ1 67.78% of responses reported a good evaluation (only 9.52% gave a bad evaluation), 67.08% outlined at least one positive effect of HTW (OQ3), and only 9.47% one or more undesired consequences (OQ4). Regarding the adequacy of HTW for workers, in OQ2, while 54.49% of the answers indicated that the overall evaluation was good, 18.45% provided a bad judgment. Likewise, whereas in OQ5, 54.49% of the answers pointed out one or more positive consequences for employees, in OQ6, 18.07% of the answers indicated at least one detrimental effect.

4. Methods

RO1 and RO2 embed several regression analyses, whose output variables are defined from the items in Table 2 and explanatory factors are quantified from the questions in Table 3.

Personal factors		
IQ1 = Gender	IQ2 = Age	IQ3 = Perception of social class
Female (48.59%) Male (51.41%)	>=55 [Boomer] (20.36%) >=35–55 [GenX] (57.39%) <35 [Others] (22.25%)	High and upper-middle (6.40%) Middle-middle (54.22%) Low-middle (13.56%) Low-proletariat (8.39) Poor/exclusion risk (4.63%) Other (6.35%)

IQ4 = Before the lock-down I bought/did by using Internet	
Fresh food (9.95%) Cooked food (21.89%) Drinks (8.18%) Dress/shoes (52.82%) Furniture (18.83%) Books (44.86%) Traveling tickets (65.95%) Press (7.32%) At least one action (93.60%)	Electronic devices (47.01%) Home appliances (25.82%) Services (36.36%) Tickets for entertainment activities (64.87%) Paying taxes (53.74%) Procedures with public administrations (64.39%) Bank transactions (78.21%)

Family factors IQ5 = Quality of Internet was a problem during the lock-down	IQ6 = Number of child	IQ7 = Living in a capital of province
Yes (27.49%) No (72.51%)	None (64.01%) One (16.89%) >=Two (19.10%)	Yes (32.97%) No (67.03%)

IQ8 = Electronic devices	IQ9 = Users in home
One (13.97%) Two (26.74%) Three (22.20%) >=Four (32.61%) NA/others (4.49%)	One (15.41%) Two (39.56%) Three (20.87%) >=Four (19.79%) NA/others (4.37%)

Organizational factors IQ10 = Teleworking before the lock-down	IQ11 = Technological equipment/help by the employer
Habitually (4.14%) 2/3 days a week (4.14%) Occasionally (11.46%) Never (85.80%)	A laptop was made available to me. (15.71%) A portable computer was given to you (9.25%) I utilized my personal computer until a laptop was provided to me (8.77%) I received compensation for the additional Internet capacity expenses (1.02%) The firm organized technical support (23.99%) At least one item (38.52%)

Job factors IQ12 = Performance with TW during the pandemic	IQ13 = Academic degree	IQ14 = Job status
Better (4.142%) Equal/noncomparable (84.4%) Worse (11.458%)	Primary or less (2.47%) Secondary (47.77%) Graduate (49.17%) Other (0.59%)	Public Administration (11.44%) Manager (11.27%) Employer/entrepreneur (14.38%)

Source(s): Own elaboration from data in CIS (2021)

Table 3.
Questions and responses on explanatory factors by active labor people in the survey used in this paper

The response variables measured the perceived advantages of HTW for firms and employees. The overall evaluations for firms (F_OVER) and employees (E_OVER) are defined from OQ1 and OQ2, respectively. They are modeled to be fitted by means of ordered logistic regression in such a way that 2 stands for a good evaluation, 1 for neutral/no evaluation and 0 in the case of negative perception. From OQ3 (OQ4), we define the variable F_POS (F_NEG) as the number of items that the surveyed person points out as having a positive (negative) effect of HTW on firms. Similarly, we define E_POS from OQ5 and E_NEG from OQ6. These outputs are count variables in such a way that they are fitted with a negative binomial regression.

We define the input variables by following Section 2 and Table 3. Therefore, we define the input variables linked to individual factors from IQ1, IQ2, IQ3 and IQ4 as follows:

(1) GENDER = dichotomous variable, where 1 stands for an answer from a female and 0 otherwise. It is obtained from the IQ1. We expect a positive sign for the influence of GENDER on F_OVER (H1.1) and E_OVER (H1.2).

(2) Age (IQ2) was measured using two dichotomous variables: GENX, which corresponds to members of the X generation (between 35 and 54 years) and B_BOOMER (55 years and more). The value fitted for these two variables on F_OVER and E_OVER will allow testing H2.1 and H2.2.

(3) H_SOC_CLASS was obtained from IQ3. It takes 1 if the respondent reports belonging to the high-upper middle class and 0 otherwise. We postulate a positive sign for the impact of this variable on F_OVER (H3.1) and E_OVER (H3.2).

(4) TC_ACT is obtained from IQ4 and is defined as the normalized sum in [0,1] of actions declared in the answers. It quantifies the habit before the lockdown in March 2020 to execute current activities such as buying food and clothing using the internet. We used this variable as a proxy for workers' attitudes toward ICTs. From H4.1 and H4.2, a positive relation of these variables with F_OVER and E_OVER, respectively, is expected.

We defined family/home variables from questions IQ5, IQ6, IQ7, IQ8 and IQ9:

(1) The adequacy of the equipment was measured using two variables. BAD_CONNECT is a dichotomous variable built up from the IQ5. It takes 1 in the case of reporting problems with internet connectivity during the COVID-19 crisis. The variable E_DEV is the number of electronic devices per user in a home, that is, the ratio IQ8/IQ9. We postulate a positive sign for the link of these two variables with F_OVER (H5.1) and E_OVER (H5.2).

(2) The capital of the provinces is located in a great part of the workplaces with clerical jobs within these geographical areas. Therefore, we defined N_CAP_PROV using IQ7. It takes 1 if the respondent reports not living in the capital of the province and 0 otherwise. H6.1 and H6.2 suggest that the relation of these variables with F_OVER and E_OVER must be positive.

(3) The number of children in the household (IQ6) is quantified using two dichotomous variables: ONE_CH, which stands for reporting one child in the household, and TWO_M_CH for two or more children. We expect a positive sign of the impact of these two variables on F_OVER (H7.1) and E_OVER (H7.2).

We built organizational variables using IQ10, IQ11 and IQ14. Thus,

(1) EMPLOYER is a dummy variable defined from IQ14, which takes the value 1 if the answer comes from an entrepreneur. This variable models the position of firms

toward HTW one year after the beginning of the COVID-19 crisis. H8.1 and H8.2 suggest a negative relationship of EMPLOYER with F_OVER and E_OVER.

(2) We consider the habit of the employee to perform HTW before March 2020 (IQ10) as a measure of the degree of HTW implementation in organizational culture. We define two dichotomous variables: TW_USU, if the respondent worked always/habitually in the TW regime, and TW_OCC, if the individual telecommuted occasionally. By following H9.1 and H9.2, both factors must have a positive influence on F_OVER and E_OVER.

(3) SUPPORT measures firm support for developing HTW during the SARS-COV-2 pandemic. It is the normalized value in [0,1] of the sum of the items in the IQ11. Again, both H9.1 and H9.2 suggest that SUPPORT must positively influence F_OVER and E_OVER.

We quantify job factors from responses in IQ12, IQ13 and IQ14. Thus,

(1) TW_PROD measures the perception of work performance due to the use of HTW during the lockdown period before March 2020. It takes 0 if the perception is worse than 0.5 in the case of neutral perception and 1 if the performance is perceived to be better. We expect a positive sign of this variable on F_OVER (H10.1) and E_OVER (H10.2).

(2) From IQ13, we define the dummy variable GRADUATE, which takes the value of 1 if the response comes from a university graduate.

(3) From IQ14, we can define two dummy variables linked to two relevant job situations for the perception of telecommuting: MANAGER, which applies if the answer comes from a manager, and PUB_WORKER, if the response comes from a civil servant.

Note that whereas H11.1 suggests that GRADUATE, MANAGER and PUB_WORKER must have a positive impact on F_OVER, H11.2 does so for their influence on E_OVER.

To assess RO1, which simply inquiries about the capability of the proposed input factors to explain the perception of the goodness of HTW on firms and workers, we fit an ordered logistic regression for F_OVER and E_OVER with respect to the input variables mentioned above. The sign and the significance of the coefficient of explanatory variables in F_OVER and E_OVER will allow assessing hypotheses developed in Section 2.

The evaluation of RO2 relies on the results of the count regressions on F_POS and F_NEG for firms and E_POS and E_NEG for employees. Therefore, if a significant factor explaining the overall judgment of HTW in companies (F_OVER) is also significant in explaining the number of positive and negative perceived effects (F_POS and F_NEG, respectively), we can conclude that the impact of that factor on acceptance and rejection from a firm perspective tends to be symmetrical. Otherwise, if this factor significantly impacts only F_POS or F_NEG, we conclude that it only contributes to F_OVER from acceptance arguments or from resistance judgments. These comments can be extended to the analogous assessment developed for impact on employees.

5. Results

5.1 Results of research objective 1

Table 4 displays the results of fitting the global judgment of the impact of HTW on companies and workers using ordered logistic regressions. This table provides an answer to RO1, which searches for the relevant factors impacting judgments about the convenience of HTW on both sides of the labor market.

Explained variable	F_OVER		E_OVER	
Variables	Marginal effect	p value	Marginal effect	p value
Individual				
GENDER (male = 0)	−0.111*	0.085	−0.146**	0.015
GENX	0.085	0.303	0.125*	0.100
B_BOOMER	0.007	0.942	0.001	0.988
H_SOC_CLASS	0.122	0.382	0.225*	0.074
TC_ACT	0.053***	<0.0001	0.033***	0.001
Family				
BAD_CONNECT	0.065	0.348	−0.055	0.385
E_DEV	−0.016	0.717	−0.021	0.600
N_CAP_PROV	0.006	0.925	0.168***	0.006
ONE_CH	−0.088	0.305	−0.090	0.260
TWO_M_CH	−0.146*	0.084	−0.243	0.002
Organizational				
EMPLOYER	−0.200**	0.048	−0.024	0.802
TW_USU	0.236*	0.070	0.152	0.181
TW_OCC	0.156	0.173	0.176*	0.081
SUPPORT	0.125***	0.002	0.081**	0.024
Job				
TW_PROD	0.618***	<0.0001	0.623***	<0.0001
GRADUATE	0.181**	0.014	0.054	0.425
MANAGERS	−0.118	0.295	0.000	0.999
PUB_WORKER	−0.036	0.732	0.158	0.105
L-R test ratio	191.55***	<0.0001	185.49***	<0.0001
McFadden pseudo R^2	6.79%		5.38%	
Cases correctly classified	68.90%		56.90%	

Note(s): "*","**" and "***" symbolize significance at the 10%, 5%, and 1% levels, respectively
Source(s): Own elaboration from data from CIS (2021)

Table 4.
Results of ordinal logistic regressions on the overall evaluation of telework for firms and employees

The model that adjusts F_OVER presents McFadden's pseudo R2= 6.79% and is significant because the likelihood ratio (LR) is 191.550 ($p < 0.0001$). Among the individual factors, only TC_ACT had a clear positive significance, with a marginal effect (me) of 0.053 ($p < 0.0001$). Being female had a weak significant negative relationship with F_OVER (me = −0.111, $p < 0.085$). Regarding family factors, only TWO_M_CHILD (me = −0.146, $p < 0.084$) had a statistically significant level. Within organizational variables, whereas EMPLOYER had a negative impact (me = −0.200, $p = 0.048$), SUPPORT (me = 0.125, $p = 0.002$) and TW_USU (me = 0.236, $p = 0.070$) had a positive influence. Regarding job factors, TW_PROD (me = 0.618, $p < 0.0001$) and GRADUATE (me = 0.181, $p = 0.014$) were significant.

The model adjusted for E_OVER (Table 4) presented a McFadden pseudo R2 = 5.38% and an LR = 185.49 ($p < 0.0001$). Being female (GENX, H_SOC_CLASS, and T_ACT) had a remarkably significant negative (positive) impact on E_OVER. Within the family variables, having two or more children (me = −0.243, $p = 0.002$) had a significant negative impact, and N_CAP_PROV (me = 0.168, $p = 0.006$) had a positive influence. Regarding organizational factors, having occasional TW activity (me = 0.176, $p = 0.081$) and support for TW by employers (me = 0.081, $p = 0.024$) had a statistically relevant impact. Among the proposed job factors, only the perception of an increase in productivity (me = 0.623, $p < 0.0001$) was significant.

Note that while GENDER, TC_ACT, the number of children in the home, the habit of TW before the first lockdown and TW_PROD impact both, the overall judgment of HTW for

firms and workers, on the other hand, having a university degree and being an employer (age, perceived social class and place of residence) present only a significant influence on F_OVER (E_OVER).

5.2 Results of research objective 2

The symmetry of the impact of the assessed factors on the perceived positive and negative effects of HTW on firms (F_POS and F_NEG) and employees (E_POS and E_NEG) is analyzed using the results displayed in Table 5.

Regarding the perception of HTW at the firm level, Table 5 shows that TC_ACT, TW_USU and TW_PROD have positive (negative) significant impacts on the number of positive (negative) perceived effects of HTW on firms. In the case of TC_ACT, me = 0.039 ($p < 0.0001$) for F_POS, and me = 0.09 ($p = 0.001$) for F_NEG. TW_USU had me = 0.131 ($p = 0.073$) over F_POS and me = −0.760 ($p = 0.059$) over F_NEG. Likewise, TW_PROD exhibited me = 0.293 ($p < 0.0001$) for F_POS and me = −1.306 ($p < 0.0001$) for F_NEG. Thus, the impact of these variables on positive and negative judgments of HTW on enterprises is nearly symmetrical.

On the other hand, Table 5 shows that GENDER, EMPLOYER, TW_OCC, SUPPORT and GRADUATE, despite having a significant impact on the number of declared positive arguments, do not follow on F_NEG. Thus, for F_POS, we found a significant positive impact of SUPPORT (me = 0.069, $p = 0.005$) and GRADUATE (me = 0.096, $p = 0.047$) and a negative impact of GENDER (me = −0.073, $p = 0.092$) and EMPLOYER (me = −0.128, $p = 0.075$). Thus, these variables are relevant only to explain the positive perceptions of the effect of HTW on enterprises.

In contrast, although age, number of children and TW_OCC were significantly linked with F_NEG, this significance was not detected in F_POS. In the adjustment of F_NEG, GENX had me = −0.460 ($p = 0.021$), ONE_CH displayed me = 0.360 ($p = 0.082$), and TWO_M_CH, me = 0.483 ($p = 0.016$).

Thus, the findings from Table 5 comment on the above two paragraphs and outline the existence of asymmetrical influences by factors such as age or the number of children on F_POS and F_NEG.

Table 5 shows the significant symmetrical influence of TC_ACT, TWO_M_CH, N_CAP_PROV and TW_PROD on the number of positive and negative opinions about the consequences of HTW on employees. Therefore, for TC_ACT, me = 0.037 ($p < 0.0001$) on E_POS and me = −0.036 ($p = 0.063$) over E_NEG. In the case of TWO_M_CH, me = −0.225 ($p = 0.003$) on E_POS and me = 0.323, $p = 0.028$ over E_NEG. For N_CAP_PROV, we adjusted me = 0.172 ($p = 0.003$) for E_POS and me = −0.284 ($p = 0.015$) over E_NEG. Finally, for TW_PROD, me = 0.445 ($p < 0.0001$) for E_POS and me = −1.173 ($p < 0.0001$) for E_NEG.

Table 5 shows that GENDER, H_SOC_CLASS and PUB_WORKER only impact significantly on E_POS, that is, they only influence positive perceptions of HTW on employees. Therefore, in E_POS, we fitted me = −0.122 ($p = 0.026$) for GENDER, me = 0.232 ($p = 0.012$) for H_SOC_CLASS and me = 0.159 ($p = 0.054$) for PUB_WORKER. On the other hand, dichotomous variables linked to age, TW_OCC and SUPPORT have a significant impact on E_NEG but not on E_POS, that is, they are only relevant to explaining negative arguments about the influence of HTW on workers. For GENX, we fitted me = −0.342 ($p = 0.015$); for B_BOOMER, me = −0.320 ($p = 0.062$); for T_OCC, me = −0.549 ($p = 0.015$); and in the case of SUPPORT, me = −0.151 ($p = 0.05$).

6. Discussion

The COVID-19 pandemic has deeply transformed Spanish society. One consequence is the spread of TW and HTW in the labor market. HTW has gone from being a marginal way of

Table 5. Results of binomial negative regressions on the number of positive and negative reasons for teleworking for enterprises and workers

	Firms				Employees			
	F_POS		F_NEG		E_POS		E_NEG	
Variables	Marginal effect	*p* value	Marginal effect	*p* value	Marginal effect	*p* value	Marginal effect	*p* value
Intercept	−0.583***	<0.0001	1.837***	<0.0001	−0.778***	<0.0001	1.916***	<0.0001
Individual								
GENDER (male = 0)	−0.073*	0.092	−0.020	0.901	−0.122**	0.026	0.147	0.207
GENX	0.042	0.441	−0.46**	0.021	−0.011	0.873	−0.342**	0.015
B_BOOMER	−0.004	0.955	−0.269	0.244	−0.135	0.115	−0.32*	0.062
H_SOC_CLASS	0.122	0.109	0.242	0.456	0.232**	0.012	0.051	0.841
TC_ACT	0.039***	<0.0001	−0.09***	0.001	0.037***	<0.0001	−0.036*	0.063
Family								
BAD_CONNECT	0.038	0.413	0.058	0.732	−0.077	0.195	0.040	0.741
E_DEV	−0.011	0.701	−0.026	0.819	−0.009	0.801	−0.017	0.832
N_CAP_PROV	0.032	0.463	0.067	0.692	0.172***	0.003	−0.284**	0.015
ONE_CH	0.008	0.895	0.36*	*0.082*	−0.002	0.973	0.216	0.155
TWO_M_CH	−0.078	0.178	0.486**	0.016	−0.225***	0.003	0.323**	0.028
Organizational								
EMPLOYER	−0.129*	0.075	0.337	0.157	0.018	0.837	−0.001	0.994
TW_USU	0.131*	0.073	−0.76*	0.059	0.078	0.404	−0.367	0.151
TW_OCC	0.093	0.151	−0.55*	0.086	0.102	0.217	−0.549**	0.015
SUPPORT	0.069***	0.004	−0.168	0.147	0.038	0.216	−0.151**	0.050
Job								
TW_PROD	0.293***	<0.0001	−1.306***	<0.0001	0.445***	<0.0001	−1.173***	<0.0001
GRADUATE	0.096**	0.047	−0.202	0.283	0.041	0.500	−0.133	0.324
MANAGERS	−0.089	0.224	0.226	0.405	−0.058	0.525	−0.206	0.373
PUB_WORKER	−0.014	0.834	−0.180	0.520	0.158*	0.054	−0.066	0.719
L-R test	195.84***	<0.0001	86.20***	<0.0001	185.7382	<0.0001	124.41***	<0.0001
R^2	9.19%		1.215%		7.97%		5.20%	

Note(s): "*","**" and "***" denote statistical significance at the 10%, 5%, and 1% levels, respectively
Source(s): Own elaboration from data from CIS (2021)

working to being widely used. Descriptive statistics show a positive global perception of the consequences of implementing HTW for both employers and employees. These findings are consistent with those of the mainstream literature (Tavares *et al.*, 2021; Nguyen, 2021; Ton *et al.*, 2022; Alotaibi and Alharbi, 2022; Moens *et al.*, 2022).

This paper has answered two RO about the perceptions of the Spanish active population on HTW with a survey by the "Centro de Investigaciones Sociológicas" conducted in March 2021. Synthesizing, with regard to RO1, which inquires about the factors that explain the overall perception of the goodness of HTW for firms (F_OVER) and employees (E_OVER), we have checked that the classical framework by Baruch and Nicholson (1997) is significant in explaining the overall judgment of the impact of working from home for firms and from employees. Likewise, we have found some common explanatory factors for F_OVER and E_OVER as well as specific variables that are only significant on one side of the labor market.

As far as RO2 is concerned, which states whether factors symmetrically impact the acceptance and rejection of HTW, we found that whereas some factors could explain positive and negative attitudes toward HTW (i.e. the habit of using ICTs in daily activities), others are relevant to exclusively explaining acceptance or resistance (e.g. the absence of firm support impacts HTW rejection from the employee's perspective, but the presence of that support does not have a significant influence on acceptance).

When assessing RO1, we found that common explanatory factors for F_OVER and E_OVER were gender, the habit of carrying out daily activities by using ICTs before COVID-19 (TC_ACT), having two or more children (TWO_M_CH), having firm support (SUPPORT) and performance perception of HTW during the pandemic (TW_PROD).

The positive impact of TC_ACT on the perception of HTW is supported by a large number of studies (Donati *et al.*, 2021; Ollo-López *et al.*, 2021; Fischer *et al.*, 2021); thus, H4.1 and H4.2 are supported. This statement also applies to the positive influence of SUPPORT (Park and Cho, 2022; Nguyen, 2021; Ollo-López *et al.*, 2021), which is in accordance with H9.1 and H9.2. The positive impact of perceived performance on the favorable perception of telecommuting has also been found in several studies (Houghton *et al.*, 2018; Nguyen and Armoogum, 2021) and allows the acceptance of H10.1 and H10.2.

We must point out that the negative relationship between being female and HTW perception, despite being contradictory to H1.1 and H1.2, is supported by Asgari *et al.* (2022). Likewise, the negative relationship between having a child and the sign of the opinion on HTW arrangements is in accordance with Elldér (2019) but contradicts mainstream literature and H7.1 and H7.2. The reasons for these last two findings may be that telecommuting could interfere with household care and family relations (Tavares *et al.*, 2021; Erro-Garcés *et al.*, 2022; Magnier-Watanabe *et al.*, 2022) and can cause work overload (De Andrés-Sánchez *et al.*, 2023). Notice that its use was not agreed upon but was mandatory during the COVID-19 pandemic, and there was neither clear regulation nor regulation about the conditions to implement it (Corral and Isusi, 2020). Likewise, females may be more affected than men because the traditional roles of women within the family often persist (Gálvez *et al.*, 2020). Moreover, this last problem has sharpened owing to the lockdown of schools (Fana *et al.*, 2020).

Being GRADUATE (EMPLOYER) has a significantly positive (negative) influence on the perception of the impact of HTW on firms. The positive influence of having a university degree is in accordance with Raišiene *et al.* (2021) and Nguyen (2021) and is in accordance with H11.1; the negative impact of being an employer is supported by Pérez *et al.* (2002) and Aguilera *et al.* (2016) and confirms H8.1.

The variable linked to the place of residence, N_CAP_PROV, indicates a positive relationship between living outside the capital of the province and the perception that HTW benefits workers. Therefore, avoiding commuting is a relevant motivation to accept HTW

for workers (Ollo-López *et al.*, 2021; Tokarchuk *et al.*, 2021; Ton *et al.*, 2022) and supports H6.2.

Having TW as a usual working mode before the pandemic (TW_USU) implies that TW was within the organizational culture before the COVID-19 crisis. Similar to Tokarchuck *et al.* (2021), we find that this variable has a positive influence on the perception of the goodness of HTW at the firm level, which is in accordance with H9.1.

We also have to note that we did not find statistical significance in the variables linked with home equipment in terms of ICTs: reporting problems with internet connection (BAD_CONNECT) and the number of electronic devices used (E_DEV). Therefore, H5.1 and H5.2 are rejected.

As far as RO2 is concerned, *stating if the assessed factors impact acceptance and resistance toward HTW symmetrically*, the results by count regressions are in accordance with the statement that the factors influencing a positive attitude toward a new technology in a given setting (in our case, ICTs in work) are not necessarily the same as those that induce resistance (Gauttier, 2019). These results show that a complete knowledge about how a factor impacts the overall judgment of HTW requires measuring whether it is due to exclusively influencing acceptance or resistance opinions or, on the contrary, impacts symmetrically in both positions. Of course, this issue has subsequent practical implications, for example, to state strategies to implement HTW at social and organization levels and to rule that work arrangement by labor authorities.

As far as our sample is concerned, TC_ACT and TW_PROD are significant in explaining F_OVER and have a symmetrical impact on positive perceptions (F_POS) and negative perceptions (F_NEG). The analogous effects of TC_ACT and TW_PROD on the perceptions of HTW for workers can be outlined. They are linked positively with E_OVER and have a significant positive impact on the number of perceived positive consequences of HTW on employees (E_POS) and a significant negative influence on the negative consequences (E_NEG).

We also found that the positive influence of TW_USU on the judgment of HTW for enterprises also impacts F_POS (positive significant relation) and F_NEG (negative significant relation) symmetrically. Likewise, N_CAP_PROV (having at least two children at home) had a significant positive (negative) influence on E_POS and a negative (positive) influence on E_NEG.

A clear implication at a business level is that although we have detected a negative relationship between EMPLOYER and the overall judgment of HTW on firms, we also checked that this relationship is because of a significant negative relationship with reporting positive outcomes of HTM but not due to a tendency to report reasons for telecommuting. Consequently, we feel that after COVID-19, the traditional resistance to HTW by some entrepreneurs may turn into a lack of interest in implementing this work mode.

A second consequence for organizations is that the support of the firm to TW is significant in explaining F_OVER and E_OVER, but in both cases, it has an asymmetrical impact on acceptance and rejection. Therefore, SUPPORT has a positive significant impact on F_POS, but this significance does not hold for F_NEG. On the other hand, the positive influence of SUPPORT on E_OVER is exclusively due to SUPPORT having a significant negative impact on E_NEG; that is, perceiving a lack of firm support induces negative arguments about the influence of HTW on workers. Therefore, to prevent workers' resistance to HTW, enterprises must provide solid support to workers in this regard. That support must embed material help but also training or measures to avoid stress and isolation (De Andrés-Sánchez *et al.*, 2023).

The negative relationship between being female and the overall judgment of HTW from both the firm and worker's point of view is induced by the negative influence of GENDER on

F_POS and E_POS (i.e. the lack of positive arguments supporting a positive attitude) but not to enabling resistance arguments.

Although we have found that age is far from the most relevant variable to explain the judgment of HTW, we have checked that it presents some statistical relevance. Therefore, similar to López Igual and Rodríguez-Modroño (2020), we have found that members of the X-generation present a slightly more favorable perception about the consequences of HTW. This perception is explained by the significant negative relationship with reporting arguments against HTW, since the relationship between GENX and F_POS and E_POS is not significant. This finding aligns with H2.2.

The first implication that we can outline at a social level is that the negative relationship between being female and having children with the sign of the perception of HTW may indicate that HTW often interferes with household and family duties during the pandemic. Thus, Spanish laws on working from home did not completely fix the conflict between companies and workers' rights and duties, as outlined in Corral and Isusi (2020). We must understand that the legislation of TW is still a work in process, whose result must rely on social agreement.

Within social implications, we can also outline that the relevance of living outside urban areas, such as the capital of provinces, in the perception of HTW for workers shows that HTW spreading not only provides advantages in alleviating environmental and ecological problems (Hopkins and McKay, 2019) but also mitigates the depopulation of rural areas, which is a great concern in Spain (Pérez-Morote *et al.*, 2021). To achieve this, it is necessary for people to perceive that living outside provincial capitals is not a barrier to developing administrative and clerical jobs, traditionally linked to living in urban areas. The spread of HTW could mitigate depopulation, but to achieve this positive effect, there is a wide development of ICT infrastructure in rural environments (Pérez-Morote *et al.*, 2021).

In short, we have shown that the classical framework by Baruch and Nicholson (1997), which proposes variables at the individual, family, organizational and job levels to explain adherence to TW, is useful to state the factors that influence the judgment of Spanish labor market members about the impact of working from home for organizations and for workers. We have also shown the relevance of stating if that judgment is due to the symmetrical or asymmetrical confluence of acceptance and resistance attitudes from a theoretical point of view and from social and business perspectives.

7. Conclusions

7.1 Theoretical implications

This study inquired about the perception of HTW in Spain one year after the COVID-19 crisis started. The overall judgment of HTW by the active population was positive. However, factors such as gender, age or the presence of children in care nuances. Likewise, we have shown that whereas some factors such as the attitude of employees toward ICTs, perceived productivity or the distance from home to work affect acceptance and resistance attitudes toward HTW, other factors such as support by the organization for HTW impact only either negative or positive perceptions of HTW.

We are aware of the limitations of our analysis, which may be the focus of further research. This study was based on a cross-sectional survey conducted in Spain in March 2021, when COVID-19 was still a deep concern for health authorities around the world. To obtain a more comprehensive understanding of the perception of HTW, it is essential to conduct subsequent studies during more advanced phases of the SARS-COV-2 crisis. This would enable a deeper exploration of the evolving attitudes and experiences related to HTW as the crisis progresses.

7.2 Practical implications

Likewise, our study is centered in Spain, which has close labor market practices to countries such as Portugal or Italy, and as in these countries, TW displayed a marginal implantation before March 2020. However, the culture and status of TW in the Spanish labor market were far from other countries, such as Anglo-Saxon countries. Therefore, we must apply with care the results of our study should be applied to other territories. It would be of interest to develop a similar analysis in other geographical areas to identify similar and dissimilar patterns in the influence of explanatory factors of HTW on its acceptance and resistance.

In our study, output questions about HTW did not differentiate that this arrangement could be implemented with different weekly frequencies: all days, two or three days a week, occasionally, and so on. Therefore, further research on the asymmetric influence of individual, family, organizational and job factors on HTW may be conducted by considering the relevant nuances linked to the frequency of HTW.

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