



Facultad de Estudios Superiores  
**IZTACALA**

# Food purchasing and preparation patterns by gender during the COVID-19 lockdown in Chilean workers

## *Patrones de compra y preparación de alimentos según género durante la cuarentena por COVID-19 en trabajadores chilenos*

Ligia Orellana<sup>1</sup>, Berta Schnettler<sup>1,2,3,4</sup>, Edgardo Miranda-Zapata<sup>5,6</sup>, Lauranna Teunissen<sup>7</sup>, Isabelle Cuykx<sup>7</sup>, Paulien Decorte<sup>7</sup>, Viktor Proesmans<sup>8</sup>, Jules Vrinten<sup>9</sup>, Sara Pabian<sup>7</sup>, Kathleen Van Royen<sup>7</sup>, Charlotte De Backer<sup>7</sup>.

<sup>1</sup> Centro de Excelencia en Psicología Económica y del Consumo, Núcleo de Ciencias Sociales, Universidad de La Frontera, Temuco, Chile.

<sup>2</sup> Facultad de Ciencias Agropecuarias y Forestales, Universidad de La Frontera, Temuco, Chile.

<sup>3</sup> Scientific and Technological Bioresource Nucleus (BIOREN-UFRO), Universidad de La Frontera, Temuco, Chile.

<sup>4</sup> Universidad Católica de Santiago de Guayaquil, Guayaquil, Ecuador.

<sup>5</sup> Facultad de Educación, Centro de Investigación Escolar y Desarrollo (Cied-UCT), Universidad Católica de Temuco, Temuco, Chile.

<sup>6</sup> Universidad Autónoma de Chile, Temuco, Chile

<sup>7</sup> Faculty of Social Sciences, Dept. of Communication Sciences, University of Antwerp, Antwerp, Belgium.

<sup>8</sup> Faculty of Economics and Business Administration, Department of Marketing, Innovation and Organisation, Ghent University, Ghent, Belgium.

<sup>9</sup> Clinical and Experimental Endocrinology, KU Leven University, Antwerp, Belgium.

**Recibido: 2022-11-10**

**Revisado: 2023-03-08**

**Aceptado: 2023-04-24**

**Título corto:** Food purchasing and preparation patterns during COVID-19

**Corresponding Author:** berta.schnettler@ufrontera.cl (B. Schnettler)

**Funding and Acknowledgments:** These results derive from the first wave of the Corona Cooking Survey, funded by Research Foundation Flanders (G047518N) and Flanders Innovation & Entrepreneurship/Flanders' FOOD (HBC.2018.0397) / VLAIO (InFLOOD research project) and FWO (From Food Media to Food Literacy project). This study was also funded by ANID - Fondecyt Project 1190017.

**Conflict of interests:** The authors declare they have no conflict of interest

**Abstract.** The COVID-19 pandemic has increased the demands that workers face regarding household food-related tasks, such as grocery shopping and cooking. The literature shows that there are differences in these demands by gender, but also based on other sociodemographic characteristics, such as schooling level. The aim of this study was to compare food purchasing and preparation patterns by gender in Chilean workers, before the COVID-19 lockdown and during the first six weeks of lockdown. The study was cross-sectional, and data was collected for the first wave of a multi-country study in April 2020. The sample was composed of 317 participants who were employed during lockdown (67.8% women, mean age of 38.14). Participants answered sociodemographic questions and reported their food purchasing and preparing practices before and during lockdown. Analysis of comparison of proportions was used. On average, during lockdown, men increased their involvement in grocery shopping while women cooked more. Overall, female workers have turned to food-related tasks more often during the pandemic than male workers. This study shows the extent to which workers have changed their degree of involvement in food-related tasks, accounting for conditions such as gender roles, schooling level and working from home. These findings can inform interventions and policies that reinforce advantageous changes brought on by lockdown measures (e.g., home-cooking) to contribute to workers' and their families' food-related well-being during and in the aftermath of the pandemic.

**Keywords:** covid-19 pandemic, cooking, gender roles, food-related life, workers

**Resumen.** La pandemia por COVID-19 ha aumentado las demandas que enfrentan los trabajadores con respecto a su alimentación, como comprar alimentos y cocinar. Estudios muestran diferencias de género en estas demandas, pero también según características sociodemográficas como el nivel de escolaridad. Este estudio comparó patrones de compra y preparación de alimentos por género en trabajadores chilenos, antes y durante el confinamiento por COVID-19. Este estudio es de corte transversal y utilizó datos de la primera ola de un estudio multinacional realizado en abril de 2020. La muestra fue 317 participantes que tenían trabajo durante el confinamiento (67.8 % mujeres, edad promedio de 38.14). Los participantes respondieron preguntas sociodemográficas y reportaron sus prácticas de compra y preparación de alimentos antes y durante el confinamiento. Se utilizó el análisis de comparación de proporciones. Durante el confinamiento, los hombres realizaron más compras de alimentos y las mujeres cocinaron más. Las mujeres se dedicaron a tareas relacionadas con la alimentación con más frecuencia durante la pandemia que los hombres. Este estudio muestra que personas trabajadoras han cambiado su nivel de involucramiento en tareas de alimentación durante la pandemia, tomando en cuenta condiciones como los roles de género, escolaridad y teletrabajo. Estos hallazgos pueden guiar intervenciones y políticas que refuercen ventajas derivadas de las medidas de confinamiento (e.g., cocinar en casa), para contribuir al bienestar alimentario de personas trabajadoras y sus familias durante y después de la pandemia.

**Palabras clave:** covid-19, cocinar, roles de género, alimentación, trabajadores

## Introduction

The COVID-19 pandemic significantly modified food practices and eating habits around the world (Eftimov et al., 2020; Lamy et al., 2022). As access to food markets and venues became limited during the pandemic, people turned to preparing meals and eating at home. Changes in food consumption patterns before and during the pandemic are notable, as recipes related to bread, flour, butter, pastry, and sauces increased since lockdown, whereas recipes including seafood, fruit, fat/oil, and corn/cereals/grains decreased (Eftimov et al., 2020). In this line, research shows that diverse countries have turned to increased planning and preparation of healthier food during the pandemic (De Backer et al., 2021). However, this tendency and the overall changes in food-related habits should be explored accounting for distinct personal characteristics and life circumstances (De Backer et al., 2021; Schnettler et al., 2022).

The COVID-19 pandemic and associated lockdown measures have not been experienced equally by all individuals, households, and populations (Power, 2020). Evidence suggests that adults with a job (i.e., formal employment) experienced fewer alterations of their daily routines due to the pandemic, compared to younger people and to those who studied, both worked and studied, or did not have an income (Orellana & Orellana, 2020). Yet workers who remained employed during lockdown, whether full- or part-time, and particularly those who started working from home, dealt with increased conflict between their workplace and their home demands (Easterbrook-Smith, 2020). Boundary theory (Ashforth et al., 2000; Field & Chan, 2018) provides a framework to understand these dynamics at a theoretical level. According to this theory, individuals set boundaries between work and personal life, and transition between these roles. The extent to which physical markers such as time and location of work and family roles can be changed (i.e., flexibility) may have increased during the pandemic for those working from home; but these roles may have also permeated one another (i.e., permeability), as individuals focusing on one role were psychologically concerned with the other (Craig & Chan, 2018). Changes in these boundaries due to the pandemic may have created greater interference, between work and home domains,

and within these domains. As an example of the latter, having more children in the household during the pandemic has been linked to lower preparation of healthier foods in both men and women (De Backer et al., 2021). Household composition may have also shifted to better manage these boundaries, as some adults sought to change their place of residence due to adverse pandemic-related conditions (e.g., young adults moving back to their parents' house, Fry et al., 2020).

The burden of these new demands has been significantly larger for women (Orellana & Orellana 2020; Power, 2020; Sevilla & Smith 2020; Wenham et al., 2020). Research conducted during the pandemic in Spain (Farré et al., 2020) and the United States (Lyttelton et al., 2020) shows that men increased their participation in childcare, but women remained responsible of chores such as laundry and cleaning. Farré et al. (2020) also reported that men's share of work increased largely due to grocery shopping, one of the few activities that justified leaving the house during lockdown in most countries.

Food purchasing and preparation trends also should be closely examined. The start of the pandemic led to "panic buying", consumers' impulsive and compulsive food purchasing behaviors based on the fear and uncertainty when facing a catastrophe (Orellana & Orellana, 2021). A study in a Central American adult sample showed that women tended to report more stress than men during the pandemic, and that stress was a predictor of panic buying (Orellana & Orellana, 2021). According to this study, reasons for these purchasing behaviors relate to dealing with negative emotions, maintaining a sense of control over the environment, and keeping loved ones protected and fed.

Gender differences have also been reported in terms of how men and women get involved in food preparation. These findings are in keeping with gender role theory (Barnett et al., 1995), which states that roles in society differ by socialization practices according to gender, and thus work roles are more significant to men's identities, while family roles are more significant to women's identities. This theory is relevant because although men and women currently spend overall less time on cooking and earning cooking skills compared to previous decades (Vélez-Toral et al., 2020), there are some nuances to this trend that refer

to traditional gender roles. A study by Smith (2018) in the United States found that home cooking increased significantly among men from 2003 to 2016, but women remained more likely to cook and to cook for more time. The “masculinization” of cooking, according to Smith (2018) is owed partly to the rise of male celebrity chefs and “foodie culture”, which treats cooking as an activity of leisure or entertainment. In Chile, Schnettler et al. (2021) found that women spent more hours cooking than their male partners, both during the week and on the weekend, in keeping with the assumption that cooking is the responsibility of women. Notably, during the pandemic, the increase in baking bread in Western countries has received heightened attention (Easterbrook-Smith, 2020; Generación M, 2020), as a feeding practice but predominantly as a leisure activity. In this sense, Easterbrook-Smith (2020) underscores that food preparation can only be leisure when this activity is optional, in contrast with the chore of domestic cooking.

Women are traditionally considered the main responsible for food-related tasks in the household, before and during the pandemic (Orellana & Orellana, 2020). However, evidence preceding the pandemic shows that the answer to who cooks at home (Smith, 2018) depends not only on gender but also on schooling level. Smith (2018) showed that both lower-educated men and higher-educated women were less likely to cook at home. Higher-educated men are more likely to hold more egalitarian ideas about gender roles and become more involved in the distribution of household labor (Davis & Greenstein, 2009). Moreover, schooling level is linked to socioeconomical status (SES). Méjean et al. (2017) found that lowest SES groups, particularly women in these groups, spend more time preparing food than people from higher SES, but belonging to a lower SES also entails less food affordability (Smith, 2018). However, Méjean et al. (2017) also showed that socioeconomic disparities in food preparation behaviors held in women, whereas few differences were observed in men.

Lockdown measures appear to have instilled changes in how food-related tasks are distributed among men and women, and within each group. On this basis, this study examines gender differences in food-related tasks that have been found to be gendered in other samples, such as purchasing food

(a task increasingly undertaken by men during the pandemic, Farré, 2020) and cooking and baking (a task predominantly undertaken by women when it is a chore, and increasingly by men for leisure, Easterbrook-Smith, 2020). Therefore, the aim of this study was to compare grocery shopping and food preparation patterns by gender before and during COVID-19 lockdown in Chilean men and women with a full- or part-time job. Sociodemographic characteristics that may indicate social inequities (De Backer et al., 2021; Orellana & Orellana, 2020) are also explored in relation to gender to better understand the participants' amount of involvement in food preparation. These characteristics are age, changes in household composition, and schooling level.

## Method

### *Participants and design*

This was a non-experimental study with a cross-sectional design and a non-probabilistic sample. The data presented here was collected in Chile, as part of the first wave of data collection of a cross-sectional, multi-country online survey launched in April 2020. The study protocol is available online at [omitted for anonymous review].

Inclusion criteria for this study was that participants were over 18 years old and were living in a county in Chile that was officially on lockdown (i.e., established by the National Ministry of Health and monitored by regional governments) at the time of the survey. The final sample was composed of 854 adults who resided in Chile (97.8% Chileans). From this overall sample, a subsample was chosen with the criterion that participants reported having a job (i.e., paid work) during lockdown. A total of 317 participants met this criterion and thus, this was the sample included in this study.

## Instrument

Participants answered each question twice, first thinking about their situation before lockdown, and then at the moment of the survey, during lockdown.

The exception to this request was participants' socio-demographic characteristics and the question about stocking food.

### **Sociodemographic questions**

These questions enquired about participants' gender, age, highest schooling level, and nationality. Participants also reported their occupation status before and during lockdown, their work conditions during lockdown (full-time or part-time, at home or outside the home), and one yes/no question regarding their loss of income since lockdown began.

### **Grocery shopping practices**

*Person(s) in charge of grocery shopping before and during lockdown.* These questions were based on Hagmann et al. (2020) Participants were asked to report who bought groceries for the household from a multiple-option list of seven individuals, including "Me", "My partner", parents, housemates, and "Others".

*Frequency of online grocery shopping before and during lockdown.* Two questions regarding frequency of ordering food online and either picking it up at the store or having delivered to the home. Response options ranged from 1 = *Never* to 7 = *Every time I shopped/shop*.

*Stocking food due to lockdown.* This question that was shown only one time to the participants. This question displayed 22 types of foods (e.g., fruit, bread, flour), and it asked participants to report the amount of each food they bought due to lockdown. Response options ranged from 1 = *Far less than usual*, to 7 = *Much more than usual*.

### **Cooking and baking**

*Person(s) in charge of cooking before and during lockdown.* These questions were based on Hagmann et al., (2020). Participants were asked who cooked for the household from a multiple-option list of seven individuals, including "Me", "My partner", parents, housemates, and "Others".

*Barriers for cooking/baking before and during lockdown.* Questions based on Caraher et al., (1999) and Larson et al. (2006). These questions listed five obstacles (e.g.,

time, skills, money) that the participant faced for cooking. Response options ranged from 1 = *Never* to 7 = *Every time I cook or bake*. Reliability was tested for scale for the two times separately; for barriers before lockdown, Cronbach's  $\alpha = .722$ , and for barriers during lockdown, Cronbach's  $\alpha = .745$ .

*Use of recipes before and during lockdown.* These questions were based on Caraher et al., (1999) and Hagmann et al. (2020), and were responded only by participants who reported cooking before and during lockdown. This question presented ten media sources of recipes (e.g., print media, TV, social media), and participants reported how frequently they sought these sources. Response options ranged from 1 = *Never* to 7 = *Every time I prepare food*.

## **Procedure**

Participants were recruited through convenience sampling. Invitations to respond the survey and related banners were shared on social media. The survey was active from mid-April until mid-May 2020, and it was aimed at counties in Chile that were on lockdown at the time of the survey. The original survey was in English, and it was translated to Spanish for this study. An informed consent form for online participation was presented at the start of the survey, explaining the study's aims and the anonymity and confidentiality of responses. Data was collected using the Qualtrics platform. The Ethics Committee of [omitted for anonymous review], and the Ethics Committee of [omitted for anonymous review] approved the study protocol.

## **Data analysis**

The sample was divided into eight groups by gender and by time (before lockdown and during lockdown), for the activities of grocery shopping and cooking. From this procedure, the following groups were established: men/women who did not cook before lockdown nor during; men/women who did not cook before lockdown but cooked during; men/women who

cooked before lockdown but not during; and men/women who cooked before lockdown and during.

Analyses were performed in SPSS v. 26. To compare the distribution of variables by gender, the analysis of comparison of proportions was used. For comparisons of paired ordinal variables, the ranking transformation procedure was used (Conover & Iman, 1981). In this procedure, each participant was assigned a value corresponding to their position when values were ranked from lowest to highest. These variables were then used as dependent variables to be compared through the parametric analysis of variance procedure, within and between groups (split plot) 2 x 2. The Mann-Whitney U Test was used to test differences among men and women in terms of level of formal education and whether they cooked or not before and during lockdown.

## Results

### Sample composition

Table 1 shows the sociodemographic characteristics of the sample, which was made up by 67.8% women and 32.2% men. Participants' age ranged from 18 to 85 years old, with a mean age of 38.14 (SD = 12.62). Most participants (37.50%) reported an undergraduate schooling level. While this entire sample reported working during lockdown, 93.7% of these participants reported working before lockdown, while the rest reported being a student (4.7%, out of which 80% also had a job) or not having a job (1.60%). No participants reported being a student during lockdown.

Most participants who worked before lockdown worked full time (77.9%), with a decrease during lockdown (63.7%). About half of the sample (51.1%) reported working full time from home, and the rest worked from home part-time (24.6%) or worked outside the home (24.30%). Nearly 73% of participants reported having the same income since lockdown began, and 73.2% reported that their household had the same composition (i.e., the same number of members) before and during lockdown. At the time of responding the survey, participants had spent an average of five weeks ( $M = 5.07$ ,  $SD = 2.68$ ) in lockdown.

**Table 1. Sample characteristics.**

Variables		Sample (n = 317)
Age [Mean (SD)]		38.14 (12.62)
Gender (%)	Female	67.80
	Male	32.20
Schooling level (%)	Incomplete high school	2.80
	High school or equivalent	24.30
	Bachelor's degree	37.50
	Master's degree	20.50
	PhD	14.80
Occupation before lockdown* (%)	Student	4.70
	Worker	93.70
	Unemployed	1.60
Work conditions during lockdown (%)	Full-time	63.70
	Over part-time	7.60
	Part-time	15.50
	Less than part-time	13.20
Working from home during lockdown (%)	Yes, full-time	51.10
	Yes, part-time	24.30
	No	24.30
Income loss since lockdown (%)	Yes	27.10
	No	72.90
Household composition changed during lockdown (%)	Yes	26.80
	No	73.20

Category "Worker" was 100% during lockdown.

Participants were also grouped by gender and by time (before lockdown and during lockdown) based on their reported grocery shopping and cooking. Table 2 shows this distribution for the overall sample. Over half of the sample reported being responsible for both grocery shopping (69.4%) and cooking (56.8%) before and during the pandemic. The resulting groups by gender are displayed in Tables 3 and 4, and their differences reported below.

**Table 2. Reports of doing grocery shopping and cooking before and during lockdown in the overall sample.**

Time	Grocery shopping		Cooking	
	N	%	N	%
Not before, not during	30	9.5	56	17.7
Not before, did during	31	9.8	68	21.5
Did before, not during	36	11.4	13	4.1
Did before and during	220	69.4	180	56.8
Total	317	100.0	317	100.0

## Changes in household composition

The average number of people who lived with participants before lockdown ( $M = 1.88$ ,  $SD = 1.33$ ) increased during lockdown ( $M = 2.50$ ,  $SD = 1.59$ ), and this was a significant difference,  $t(83) = -3.352$ ,  $p = .001$ . However, when asked about the number of children living in the household, participants did not report significant differences,  $F(77, 1) = .042$ ,  $p = .839$ . Therefore, changes in number of household members are assumed to refer to the number of adults.

The increase in number of household members is more notable among men who did the grocery shopping before but not during lockdown, who reported living, respectively, with zero and six people. Furthermore, out of the eight groups, men who reported not cooking before nor during lockdown reported a higher average of cohabiting household members both before ( $M = 2.50$ ,  $SD = 1.19$ ) and during lockdown ( $M = 3.75$ ,  $SD = .70$ ).

## Changes in grocery shopping by gender

Participants were asked about who did the grocery shopping, whether in-site or online, for their household before and during lockdown. There was a higher proportion of women, compared to men, who reported conducting this activity before lockdown but not during. In the case of women who went grocery shopping before but not during lockdown, 81.5% indicated

that in Time 2, it was their partner who did the shopping. These results are shown on Table 3.

All participants were asked whether they purchased different foods at the start of lockdown. Differences were observed between men and women in three products. Compared to men, women reported purchasing more flour ( $p = .011$ ), yeast ( $p = .003$ ) and milk ( $p = .001$ ).

Among men and women who worked from home full-time during lockdown ( $n = 162$ ), there was a higher proportion of participants who did grocery shopping before lockdown but not during, compared to those who did not do their grocery shopping before nor during lockdown. Most women who reported doing grocery shopping before and during lockdown (58%) were working from home full-time during lockdown. Out of women who worked full-time from home and who did grocery shopping before but not during, 77.8% reported that it was their partner who took care of grocery shopping during lockdown. Most men who reported not doing grocery shopping before nor during lockdown (53.8%) kept working outside the home during lockdown.

Men and women who reported doing grocery shopping before and during lockdown were asked about online grocery shopping. In this case, differences between men and women increased during lockdown. Compared to before lockdown, women reported doing more online shopping and men reported doing less, during lockdown,  $F(1, 218) = 4.57$ ,  $p = .034$ ,  $\eta_p^2 = .021$ .

**Table 3. Person in charge of grocery shopping before and during lockdown by gender.**

I do grocery shopping	Women		Men		Total	
	N	%	N	%	N	%
Not before, not during	17a	7.9	13a	12.7	30	9.5
Not before, did during	20a	9.3	11a	10.8	31	9.8
Did before, not during	35a	16.3	1b	1.0	36	11.4
Did before and during	143a	66.5	77a	75.5	220	75.5
Total	215	100	102	100	317	100

Note: Subindex letters show categories which do not significantly differ at  $p$  level of .05.

## Cooking and baking

The cooking and baking questions asked participants who were responsible for these activities in their household before and during lockdown. Participants who did not cook during lockdown tended to report less who else cooked (i.e., they skipped these questions more frequently) than those who did cook during lockdown. The exception to this trend is the group of participants who did not cook before nor during lockdown. Most men in this group reported that during lockdown the person who cooked was their partner (48.6%) and mother (35.1%), while most women indicated that during lockdown the person who mostly cooked at home was their partner (31.3%) and mother (56.3%). Among women who reported cooking during lockdown, whether they did it or not before, their partner (19.4% and 17%, respectively), and their mother (9.7% and 13.8%, respectively) also cooked.

Crosstabs of cooking before and during the lockdown by gender are displayed on Table 4. These results show that more women than men reported cooking before and during lockdown. There was also a higher proportion of men, compared to women, who did not cook before nor during the lockdown, and a higher proportion of women who did not cook before but cooked during the lockdown.

**Table 4. Cooking before and during the pandemic by gender.**

I cook	Women		Men		Total	
	N	%	N	%	N	%
Not before, not during	21a	9.8%	35b	34.3%	56	17.7%
Not before, did during	54a	25.1%	14b	13.7%	68	21.5%
Did before, not during	8a	3.7%	5a	4.9%	13	4.1%
Did before and during	132a	61.4%	48b	47.1%	180	56.8%
Total	215	100%	102	100%	317	100%

Note: Subindex letters show categories which do not significantly differ at  $p$  level of .05.

Regarding baking activities, men reported that they baked bread more frequently than women before lockdown, while women reported baking bread more than men during lockdown,  $F(1, 178) = 8.99, p = .003, \eta_p^2 = .048$ .

Complementary questions about the use of recipes were responded only by men and women who reported cooking before and during lockdown ( $n = 180$ ). Before lockdown, women used more print media to access recipes compared to men,  $U(N_{\text{women}} = 132, N_{\text{men}} = 48) = 2588.50, z = -1.97, p = .049$ . However, this difference was not seen during lockdown,  $U(N_{\text{women}} = 132, N_{\text{men}} = 48) = 2732.50, z = -1.53, p = .126$ . Before lockdown, both men and women used social media to seek recipes,  $U(N_{\text{women}} = 132, N_{\text{men}} = 48) = 3016, z = -.50, p = .615$ , but during lockdown, women tend to use it more than men,  $U(N_{\text{women}} = 132, N_{\text{men}} = 48) = 2526.50, z = -2.12, p = .034$ .

## Cooking while working full-time

Participants who worked full-time ( $n = 170$ ) were asked whether they cooked before and during the lockdown. The proportion of women who did not cook before and did cook during (61.1%) was significantly higher than the proportion of men who did not cook at either time (25.7%,  $p < .05$ ). Also compared to this latter group, there was a higher proportion of women who reported cooking at both times (56.1%,  $p < .05$ ). Lastly, the proportion of men who did not cook at either time and worked outside the home (51.4%) was higher than the proportion of women working outside the home who reported cooking during the lockdown, whether they cooked before (16.7%) or not (11.1%,  $p < .05$ ).

When asked about cooking barriers, women reported more than men that time was a barrier for cooking before lockdown. During lockdown, however, men reported more than women that time was a barrier for this activity,  $F(1, 178) = 3.96, p = .048, \eta_p^2 = .048$ . Women reported that their cooking skills were a limitation more than men before lockdown. During lockdown, men reported more than women that their cooking skills were a barrier to preparing meals,  $F(1, 178) = 9.20, p = .003, \eta_p^2 = .049$ .



## Sociodemographic differences in grocery shopping and cooking

There were no differences by age between the categories of those who do the grocery shopping,  $F(3, 316) = 1.208$ ,  $p = 0.307$ ; between the categories of the combined variables *I do the grocery shopping* by gender  $F(7, 316) = 1.547$ ,  $p = .151$ , nor in the categories of the combined variable *I cook* by gender,  $F(7, 316) = 1.909$ ,  $p = .068$ . There was no significant effect of the interaction between the number of people in the participants' household before and during the lockdown and *I do grocery shopping* ( $p = .456$ ).

There were differences in terms of the level of schooling attained, between the combined categories of *I cook* and gender. Men who reported not cooking before but cooking during lockdown had the highest schooling levels from all eight groups. The highest and the lowest median from this comparison showed a significant difference in terms of schooling years between this group and that of men who did not cook before nor during lockdown,  $U(N_{\text{menNotbefDur}} = 14, N_{\text{menNotbefNotdur}} = 35) = 134$ ,  $z = -2.52$ ,  $p = .012$ , and the group of women who did not cook before nor during lockdown,  $U(N_{\text{menNotbefDur}} = 14, N_{\text{womenNotbefNotdur}} = 21) = 85.50$ ,  $z = -2.17$ ,  $p = .037$ . Furthermore, men who did not cook before but cooked during reported higher schooling level than women who cooked before and during lockdown,  $U(N_{\text{menNotbefDur}} = 14, N_{\text{womenBefDur}} = 35) = 132$ ,  $z = -2.27$ ,  $p = .023$ . Men who did not cook before nor during had lower schooling levels than women who did not cook before but cooked during lockdown,  $U(N_{\text{menNotbefNotdur}} = 35, N_{\text{womenNotbefDur}} = 54) = 615$ ,  $z = -2.86$ ,  $p = .004$ .

Lastly, there was a significant interaction effect between the number of people living with the participant before and during the lockdown and the combined variable *Gender/I cook*. As reported, the number of household members increased from before to during lockdown,  $F(7, 76) = 2.55$ ,  $p = .020$ ,  $\eta_p^2 = .19$ . This was not the case, however, for women who reported not cooking before but did during the lockdown, who reported fewer members before ( $M = 2.47$ ,  $SD = 1.46$ ) than during ( $M = 2.24$ ,  $SD = 1.85$ ) lockdown.

## Discussion

This study compared food purchasing and preparation patterns by gender before and during COVID-19 lockdown in Chilean workers. A secondary aim was to further explore these differences by accounting for three sociodemographic characteristics: Age, household composition, and schooling level. These characteristics were chosen based on previous literature (De Backer et al., 2021; Méjean et al., 2017; Orellana & Orellana, 2020; Smith, 2018) that suggest they affect the individuals' degree of involvement in food-related activities. The results of this study showed that men and women experienced distinct changes in their food purchasing and preparation habits during the pandemic, but that these changes have nuances based on other individual or household-related factors.

## Differences in grocery shopping

Research on "panic buying" during the pandemic research suggests that these behaviors may be a response to negative emotions that arise during a catastrophe, or to gain a sense of control in a threatening context (Orellana & Orellana, 2021). In this study, to explore self-perception of changes in food purchases due to the pandemic, participants were asked about changes in the amounts they bought of 22 food items. This included fruit, veggies, snacks, frozen food, nuts, water, and alcohol. Changes in the amount of food purchase were found only in three items: Flour ( $p = .011$ ), yeast ( $p = .003$ ) and milk ( $p = .001$ ), and women reported buying more of these products due to the pandemic than men. It is notable that these products are raw materials to prepare other foods, including bread. Cooking and baking increased during the pandemic, either for sustenance or leisure (Easterbrook-Smith, 2020; Generación M, 2020). Whichever purpose was given to these products by participants in this sample, our results suggest that women may have been more concerned about stocking up on these products. This pattern is in line with reasons provided to increase food purchases during the pandemic: It can restore a sense

of personal efficacy and, in keeping with traditional gender roles assigned to women, caring for loved ones by providing foodstuffs (Orellana & Orellana, 2021).

This study, in keeping with previous findings (Farré et al., 2020) showed that men have increased their involvement in grocery shopping during the pandemic. In cases when women did grocery shopping before the pandemic but not during, it was most frequently their male partner who took over this task. Additionally, when participants oversaw grocery shopping both before and during the pandemic, women reported having increased their grocery shopping online whereas men decreased it, compared to pre-pandemic times. These results suggest that, in keeping with gender role theory (Barnett et al., 1995), the traditional gender roles that men are expected to fulfill in the home continue during the pandemic. Activities that men carry out outside the home and the family domain (e.g., paid job, grocery shopping) are recognized as a contribution to these domains, while women who conduct activities outside the home (e.g., a paid job) are required to also work inside the home to get the same recognition (Orellana et al., 2021). Women with a job have thus continued taking on most of housework during the pandemic (Farré et al., 2020; Lyttelton et al., 2020; Orellana & Orellana 2020; Sevilla & Smith 2020). While leaving the house to do grocery shopping could be a stressful task during lockdown (Vida & Popovics, 2020), it could also provide a much-needed break from the domestic confinement measures. Overall, these results suggest that, at the beginning of lockdown, women working from home adjusted to the combined responsibilities of the work and home domains by turning to online grocery shopping or negotiating that her (male) partner, or other household members, adopted this responsibility.

In this study, a significant proportion of participants—men and women— who reported working full-time from home also reported that they did grocery shopping before lockdown but not during. However, in terms of gender, a significant proportion of women working full-time (58%) reported doing their grocery shopping before the pandemic and during, which might align with the previous finding of an increase in online shopping for women. On the other hand, women who worked full-time from home

but reported not doing grocery shopping during lockdown stated that it was their male partner who took on this task. Pre-pandemic studies with dual-earner couples have distinguished between emotional and instrumental support, stating that the latter type provided by men to women improves women's well-being and balance between work and other life roles (Orellana et al., 2021). In this line, these findings suggest that other household members took charge of grocery shopping, as a form of instrumental support for the worker during the pandemic.

Results also showed that a proportion of men did not do grocery shopping before nor during lockdown worked outside the home (53.8%). Additional data showed that it was this group that also reported a significant increase of household members during lockdown, going from zero to six household members, excluding the respondent. While the data from this study cannot explain this notable increase for this group of men, it suggests an increase in instrumental family support. That is, these participants had to continue working outside the home during the pandemic (e.g., frontline jobs, independent trade) and thus might have been relieved from food purchase responsibilities.

## Differences in cooking

The results from this study reflect the gendered trend in which women spend more time cooking than men (Smith, 2018; Schnettler et al., 2021). Findings showed a significantly higher proportion of men who did not cook before nor during the lockdown, and a significantly higher proportion of women (25%) who did not cook before but cooked during lockdown. These findings support gender role theory proposition, showing that traditional gender roles may have been reinforced during the pandemic (Power, 2020). Women reported baking more bread than men during lockdown, possibly in keeping with the purchase of bread-related food products (i.e., flour). It is not clear whether these women turned to cooking as an optional/entertainment activity or out of necessity. Nevertheless, previous literature, plus the more frequent baking and purchase of bread-related products

trends observed in this study, suggest that women in this sample got more involved in cooking and baking during the pandemic due to necessity.

Among participants who were working full-time during lockdown, a significant proportion of men reported not cooking either before nor during lockdown, and working outside the home during the pandemic. These participants appeared to have less flexible boundaries between work and home (Ashforth et al., 2000), allowing a segmentation of their roles in these domains. This proportion of men was significantly higher than the proportion of women working outside the home who reported cooking during lockdown, whether they had cooked before lockdown or not. Overall, these results show that more women than men found themselves in need to start cooking during lockdown.

Among men and women who reported not cooking before nor during lockdown, it was their partner and/or their mother who took on this task. Women who also reported cooking during lockdown reported the same. While partners refer to either gender, the presence of the mother in all cases is notable. This trend poses the issue of the feminization of care labor. Particularly in Latin America, women—often mothers and grandmothers—are expected to take full responsibility for domestic labor (Schnettler et al., 2017), and to be responsible for everyday cooking (De Backer et al., 2021), and other household food tasks such as planning schedules and meals (Power, 2020; Schnettler et al., 2017). Furthermore, participants in this study were adults, and it was assumed that most of them would live outside of the parental home at the time of the survey. Reporting their mother (and other supporting figures besides their partner) as the person who cooks at home may relate to the changes seen in household members before and during the pandemic.

Participants who worked full-time were also asked about the cooking barriers they have faced before and during the pandemic. Cooking barriers relate to either personal (skills) or environmental (time, equipment) factors (Vélez-Toral et al., 2020), and those most reported in this study were time and skills. Women in this study reported that they faced these two barriers more than men before lockdown, while during lockdown men reported facing these barriers more than

women. These latter responses may be for men who have had to take on “domestic cooking” tasks. Due to gender norms around cooking, women are more likely than men to report more confidence in their skills (Smith, 2018). Yet it should be recalled that, when participants were asked about the use of recipes during lockdown, women tended to use more social media than men. Especially for women who had to start cooking during lockdown, it can be hypothesized that women sought out these online resources more not only to develop or strengthen their cooking skills, but also to better plan meals in advance. Actual cooking is supported by other food-related tasks traditionally assigned to women (Barnett et al., 1995): preparing shopping lists and selecting proper ingredients and ensuring that the meals will be eaten and enjoyed by all family members (Schnettler et al., 2017).

## Gender differences accounting for sociodemographic characteristics

Age, gender, and number of household members had no significant effects when they were combined with participants' cooking and grocery shopping (i.e., items “I cook”, “I do grocery shopping”). However, differences emerged in the combined categories of cooking and gender when participants' schooling level was accounted for, in line with previous research (Smith, 2018). These differences were most marked among men. Given that schooling level is associated with socioeconomic status, this result is contrary to research (Méjean et al., 2017) showing that socioeconomic status influences cooking activities in women, but not in men.

Men who did not cook before nor during lockdown had a lower schooling level than those who did not cook before but did during lockdown. This latter group also had the highest schooling levels of all groups. In a pre-pandemic study, Smith (2018) found increases over time in cooking only for men with middle- or higher-schooling level, not for men with lower schooling level. Men with higher schooling level are reported to get more involved in housework (Davis & Greenstein, 2009) yet considering that these participants reported not cooking before lockdown, it is not

known whether they started cooking as leisure or as a necessity. Moreover, men who did not cook before nor during lockdown had on average a lower schooling level than women who did not cook before but cooked during lockdown. Smith (2018) found that both lower-educated men and higher-educated women were less likely to cook at home. From these findings, it can be suggested that even among the groups who cook less at home by schooling level, the group of women is more likely than that of men to take up cooking.

Lastly, changes in number of household members during the pandemic also showed an effect in the combined variables of cooking and gender. Women who reported not cooking before but did during the lockdown showed a decrease in the number of cohabitants. It might be that the person or people who left these participants' household during lockdown helped with cooking. The opposite situation was seen in men who did not cook before nor during the pandemic, who reported an increase in household members. Contrary to the women's situation, in this latter case it may be that other family members moved into the participants' household, or the participant moved into another household. Household composition thus may have been a factor in the flexibility and permeability of work and home roles (Craig & Chan, 2018) for workers in this sample. The number of family members and the degree of support they provided may have been key in the degree of interference these workers experienced between different work and food-related tasks. Nevertheless, among the findings of who cooks for the household, it should be noted that the figure of the mother was frequently reported among groups of participants of different genders and occupations. This result is not surprising, considering that cooking for others is a task traditionally assigned to women, as part of a role that entails looking after the family (Barnett et al., 1995).

## Limitations

The first limitation is that this study had a cross-sectional design, and its sample was non-probabilistic. Causality cannot be established, nor results can be generalized to the Chilean population. A second limitation is that all data was self-reported, and answers

provided by participants might have been influenced by recall bias or social desirability bias. It should also be noted that some of the questions in this study have not been previously assessed in their current form, or are not measurement scales, and thus their psychometric properties cannot be reported. Lastly, this sample represents a specific segment of the Chilean population that might have adequate access to food, given that these participants kept their job during lockdown, and 73% of the sample reported no income loss for that period. This figure might have changed as the pandemic progressed, however. More research is needed on the mid-pandemic dynamics of household food-related tasks in samples from lower SES, and with diverse job status. Moreover, while we conducted a general examination of eight groups (based on gender and whether food-related tasks were conducted before and during lockdown), future studies can focus on specific groups to probe. For instance, it should be explored why some household members took up or abandoned food-related tasks during the pandemic, the impact of these changes in other household members, and whether these remain over time.

## Conclusions

This study contributes with evidence that the pandemic and related lockdown measures increased gender inequality at home in the food domain. Workers who remain employed during the COVID-19 pandemic face new challenges to either maintain or improve their food purchasing and preparation practices, for themselves and often their households. Theoretically, this study illustrates dynamics posed by both gender role theory and boundary theory during the pandemic. Pre-pandemic gender inequalities at home have been reinforced during the pandemic, as the larger responsibility for solving food-related challenges in the household continue to fall on women. Nevertheless, besides gender, other factors such as schooling level, working from home, and household composition changes contribute to the interference that the work and food-domain have with one another, and thus to the decisions that individuals make regarding their food-related tasks at home.

On this basis, future research and interventions may focus on different profiles of workers who are (or are not) in charge of food purchasing and preparation, and whether these responsibilities have switched during the pandemic. These nuanced conditions associated with gender differences in food-related tasks can inform interventions and policies that reinforce advantageous changes brought on by the pandemic (i.e., home-cooking, higher involvement of men in care labor). This knowledge can help better support workers during and in the aftermath of the pandemic.

## References

- Ashforth, B. E., Kreiner, G. E., & Fugate, M. (2000). All in a day's work: Boundaries and micro role transitions. *Academy of Management Review*, 25(3), 472-491. <https://doi.org/10.5465/AMR.2000.3363315>
- Barnett, R. C., Raudenbush, S. W., Brennan, R. T., Pleck, J. H., & Marshall, N. L. (1995). Change in job and marital experiences and change in psychological distress: a longitudinal study of dual-earner couples. *Journal of Personality and Social Psychology*, 69(5), 839.
- Caraher, M., Dixon, P., Lang, T., & Carr-Hill, R. (1999). The State of Cooking in England: The Relationship of Cooking Skills to Food Choice. *British Food Journal*, 101 (8): 590-609. <https://doi.org/10.1108/00070709910288289>
- Conover, W., & Iman, R. (1981). Rank transformations as a bridge between parametric and nonparametric statistics. *The American Statistician*, 35(3), 124. <https://doi.org/10.2307/2683975>
- Davis, S., & Greenstein, T. (2009). Gender Ideology: Components, Predictors, and Consequences. *Annual Review of Sociology*, 35(1): 87-105. <https://doi.org/10.1146/annurev-soc-070308-115920>
- De Backer, C., Teunissen, L., Cuykx, I., Decorte, P., Pabian, S., Gerritsen, S., ... & Corona Cooking Survey Study Group (2020). An evaluation of the COVID-19 pandemic and perceived social distancing policies in relation to planning, selecting, and preparing healthy meals: an observational study in 38 countries worldwide. *Frontiers in Nutrition*, 7, 621726. <https://doi.org/10.3389/fnut.2020.621726>. WoS (Q1).
- Easterbrook-Smith, G. (2020). By Bread Alone: Baking as Leisure, Performance, Sustenance, during the COVID-19 Crisis. *Leisure Sciences*, 43(1-2), 36-42. <https://doi.org/10.1080/01490400.2020.1773980>.
- Eftimov, T., Popovski, G., Petković, M., Koroušić, B., & Kocev, D. (2020). COVID-19 Pandemic Changes the Food Consumption Patterns. *Trends in Food Science & Technology*, 104, 268-72. <https://doi.org/10.1016/j.tifs.2020.08.017>.
- Farré, L., Fawaz, Y., González, L., & Graves, J. (2020). How the COVID-19 Lockdown Affected Gender Inequality in Paid and Unpaid Work in Spain. IZA. <https://www.iza.org/publications/dp/13434/how-the-covid-19-lockdown-affected-gender-inequality-in-paid-and-unpaid-work-in-spain>.
- Field, J. C., & Chan, X. W. (2018). Contemporary knowledge workers and the Boundaryless Work-Life Interface: Implications for the Human Resource Management of the Knowledge Workforce. *Frontiers in Psychology*, 9, <https://doi.org/10.3389/fpsyg.2018.02414>
- Fry, R., Passel, J., & Cohn, D. (2020, September 4). A majority of young adults in the U.S. live with their parents for the first time since the Great Depression. *Pew Research Center*. <https://pewrsr.ch/351SVs1>.
- Generación M (2020, 16 de octubre). Las Nuevas Tendencias En El Consumo de Pan: Canal Artesanal y Online Para Un Producto Fresco. *El Mostrador*. <https://www.elmostrador.cl/generacion-m/2020/10/16/las-nuevas-tendencias-en-el-consumo-de-pan-canal-artesanal-y-online-para-un-producto-fresco/>.
- Hagmann, D., Siegrist, M., & Hartmann, C. (2020). Acquisition of cooking skills and associations with healthy eating in Swiss adults. *Journal of Nutrition Education and Behavior*, 52(5), 483-91. <https://doi.org/10.1016/j.jneb.2019.12.016>
- Lamy, E., Viegas, C., Rocha, A., Raquel Lucas, M., Tavares, S., Capela E Silva, F., Guedes, D., ... & Consortium for Changes in Food Behavior - COVID-19 (2022). Changes in food behavior during the first lockdown of COVID-19 pandemic: A multi-country study about changes in eating habits, motivations, and food-related behaviors. *Food Quality and Preference*, 99, 104559.
- Larson, N., Perry, C., Story, M., & Neumark-Sztainer, D. (2006). Food Preparation by Young Adults Is Associated with Better Diet Quality. *Journal of the American Dietetic Association* 106(12), 2001-7. <https://doi.org/10.1016/j.jada.2006.09.008>.
- Lyttelton, T., Zang, E., & Musick, K. (2020). Before and during COVID-19: Telecommuting, Work-Family Conflict, and Gender Equality. *Council on Contemporary Families*. <https://contemporaryfamilies.org/covid-19-telecommuting-work-family-conflict-and-gender-equality/>.
- Méjean, C., Si Hassen, W., Gojard, S., Ducrot, P., Lampuré, A., Brug, H., Lien, N., ... & Castetbon, K. (2017). Social

- Disparities in Food Preparation Behaviours: A DED-IPAC Study. *Nutrition Journal* 16(62), 1-13. <https://doi.org/10.1186/s12937-017-0281-2>.
- Orellana, C., & Orellana, L. (2020). Predictores de síntomas emocionales durante la cuarentena domiciliar por pandemia de COVID-19 en El Salvador. *Actualidades En Psicología*, 34(128), 103–120. <http://dx.doi.org/10.15517/ap.v34i128.41431>
- Orellana, C. & Orellana, L. (2021). Síntomas emocionales y compras por pánico durante la pandemia de COVID-19: Un análisis de trayectoria. *Psicogente*, 24(45), 1-19. <https://doi.org/10.17081/psico.24.45.4163>
- Orellana, L., Schnettler, B., Miranda-Zapata, E., Lobos, G., Lapo, M., Adasme-Berríos, C., & Hueche, C. (2021). Resource transmission is not reciprocal: A dyadic analysis of family support, work-life balance, and life satisfaction in dual-earner parents with adolescent children. *Sex Roles*, 85(1–2), 88–99. <https://doi.org/10.1007/s11199-020-01207-0>
- Power, K. (2020). The COVID-19 pandemic has increased the care burden of women and families. *Sustainability: Science Practice and Policy*, 16(1), 67–73. <https://doi.org/10.1080/15487733.2020.1776561>
- Schnettler, B., Lobos, G., Miranda-Zapata, E., Denegri, M., Ares, G., & Hueche, C. (2017). Diet quality and satisfaction with life, family life, and food-related life across families: A cross-sectional pilot study with mother-father-adolescent triads. *International Journal of Environmental Research and Public Health*, 14(11), 1-24. <https://doi.org/10.3390/ijerph14111313>.
- Schnettler, B., Rojas, J., Grunert, K., Lobos, G., Miranda-Zapata, E., Lapo, M. & Hueche, C. (2021). Family and food variables that influence life satisfaction of mother-father-adolescent triads in a South American country. *Current Psychology*, 40(8), 3747–64, 2021. <https://doi.org/10.1007/s12144-019-00328-4>
- Schnettler, B., Orellana, L., Miranda-Zapata, E., Saracostti, M., Poblete, H., Lobos, G., Adasme-Berríos, B., Lapo, M. (2022). Diet quality during the COVID-19 pandemic: Effects of workplace support for families and work-to-family enrichment in dual-earner parents with adolescent children. *Appetite*, 169, 105823. <https://doi.org/10.1016/j.appet.2021.105823>
- Sevilla, A., & Smith, S. (2020). Baby steps: The gender division of childcare during the COVID-19 pandemic. *Oxford Review of Economic Policy*, 36(1), 169–186. <https://dx.doi.org/10.1093%2Foxrep%2Fgraa027>
- Smith, L. (2018). Who's cooking? Trends in US home food preparation by gender, education, and race/ethnicity from 2003 to 2016. *Nutrition Journal*, 17(41), 1-19, 2018. <https://dx.doi.org/10.1186/s12937-018-0347-9>.
- Vélez-Toral, M., Rodríguez-Reinado, C., Ramallo-Espinoza, A., Andrés-Villas, M. (2020). 'It's important but, on what level?': Healthy Cooking Meanings and Barriers to Healthy Eating among University Students. *Nutrients*, 12(8), 1-16. <https://dx.doi.org/10.3390%2Fnu12082309>
- Vida, V., & Popovics, P. (2020). Impact of the Covid-19 on Behaviour: A Survey of Different Aspects of Life of the Hungarian Population. *CrossCultural Management Journal*, 2, 161–74. <https://www.ceeol.com/search/article-detail?id=937277>
- Wenham, C., Smith, J., Morgan, R., & Gender and COVID-19 Working Group (2020). COVID-19: The Gendered Impacts of the Outbreak. *Lancet*, 395(10227), 846–48. [https://doi.org/10.1016/S0140-6736\(20\)30526-2](https://doi.org/10.1016/S0140-6736(20)30526-2)