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Behavioral Economics

*Gender and competition*

**Effect of the 4th Covid-19 wave on the gender  
gap in attitude towards competition in the  
Netherlands**

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The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics or Erasmus University Rotterdam.

## **Abstract**

This research investigates the effect of the fourth and last Covid-19 wave on the gender gap in attitudes towards competition in the Netherlands. Since competitiveness safely predicts labor market outcomes, the aim is to identify whether any potential correlation influences labor outcomes. Previous literature hints that economic shocks as well as environments that undergo increased stress, performance pressure, and a “conservative shift” in the gender role attitudes increase women’s distaste towards competition widening the gap. By employing the Joint European Values Survey / World Values Survey 2017-2022 dataset, I explore whether the last wave of the pandemic along with its two subphases characterized by strict and medium containment policies to halt the spread of the Omicron variant widened the disparity in the taste for competition between men and women. The findings suggest that contrary to the literature, the pandemic has no correlation with the gender gap in competitive preferences. To assess the basic motivation, the results are repeated including the industry and only working mothers; no effect is detected. However, individual competitive preferences do affect income when this very significant phase is considered. According to the findings, Dutch females during the strictest period of the Omicron variant spread earned less compared to Dutch men. Overall, the results suggest that competitive attitudes are shaped following a different mechanism than other economic preferences which calls for further research on the topic.

## **Keywords**

*competition, Covid-19, gender gap, economic preferences*

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# 1. Introduction

According to the Stanford Encyclopedia of Philosophy (2022), preferences are “subjective comparative evaluations”. They are psychological traits (Cortes and Pan, 2007) that drive decisions and often help explain the diverse choices of individuals (Azmat and Petrongolo, 2014). In economics, they are also the motives behind the decision-making process of humans (Becker et al., 2018). The most thoroughly studied economic preferences include risk, time, and social preferences. Yet, there is an additional one that has received less attention, notwithstanding its importance in real-life economic outcomes; competitiveness (Buser, 2019; Saccarod et al., 2018). Competitive attitudes at the individual are directly linked to career and labor market choices and in particular, salary and career and study paths (Buser et al., 2014). People possessing more favorable attitudes towards competition assume higher positions, more money, and often a technical education and interestingly, willingness to compete predicts career decisions to a better extent compared to other characteristics (Buser, 2019).

On the other end of the spectrum, identity, and more precisely gender -an aspect of identity- is an additional motive of behavior (Akerlof and Kranton, 2000). Both preferences and gender seem to impact economic outcomes and create gender differences in such outcomes (Cortes and Pan, 2007; Akerlof and Kranton, 2000). One such discrepancy has been detected in competitive tastes, with men exhibiting more positive attitudes than women (Niederle and Vesterlund, 2007; Croson and Gneezy, 2009; Niederle and Vesterlund, 2011; Saccarod et al., 2018). To the extent that this gender gap is systematic, it contributes to the observed differences in labor outcomes (Azmat and Petrongolo, 2014). Indeed, the gender gap in attitude towards competition has been accused of the gender imbalance in earnings, career advancement as well as participation in the workforce (Balafoutas et al., 2018; Blau and Kahn, 2004).

By all means, preferences are not stable (Loewenstein and Anger, 2003; Akerlof and Kranton, 2000). They change due to “endogenous change in taste”, “temporal proximity”, “conditioning”, “maturation”, “visceral reasons”, “social influence”, and “motivated taste” (Loewenstein and Anger, 2003). They can also change following an identity shift that evolves within society and affects norms, stereotypes, and gender role attitudes (Akerlof and Kranton, 2000). A question then arises; do preferences also change as a result of an exogenous economic shock like the Covid-19 pandemic?

On the labor front, the pandemic led to job losses, reduced workforce participation, and increased unemployment rates in several countries (Al-Masbhi and Al-Masbhi, 2021) with women experiencing the repercussions much more than men (Goldin, 2022; Alon et al., 2021; Farré et al., 2020; Couch et al., 2021; Petts et al., 2020; Albanesi and Kim, 2021). The unprecedented circumstances brought about by Covid-19 have disrupted gender dynamics with a shift towards more traditional views and have affected the emotional and belief states of many

individuals (Lee et al., 2021; Alsharawy et al., 2021; Altig et al., 2020; Fetzl et al., 2020; Boring et al., 2022). Channeled through psychological and societal mechanisms, disruptions can change preferences drastically (Alwin et al., 1983; Fernández et al., 2004).

Overall, evidence suggests that competitive taste is a strong predictor of labor outcomes, which were also heavily impacted by the pandemic. As such, this study tries to shed light on a potential relationship between Covid-19 and the attitudes towards competition of men and women. This research elaborates more implicitly on whether the gender gap in competitive preferences is influenced by the fourth wave of the pandemic, during which the Omicron variant was spreading in the Netherlands, by trying to answer the following research question: “What was the impact of Covid-19 on the gender gap in the attitude towards competition?”

Apart from unveiling a potential effect of the pandemic on male and female competitive preferences, this study’s predominant motivation is to test whether an exogenous economic shock has long-term repercussions on labor outcomes. In analyzing that, it contributes to the limited research that tests the effect of attitudes on the economy (Fernández et al., 2004). Either directly or indirectly through preference formation, Covid-19 has been well-documented to alter the status quo in the labor arena, with both paths pointing to women as more heavily bearing the consequences (Goldin, 2022; Alon et al., 2021; Farré et al., 2020; Couch et al., 2021; Petts et al., 2020; Albanesi and Kim, 2021). However, more recent literature supports that the disproportionate impact concerns the descent into the pandemic, when the shock occurred, and that during the pandemic, the consequences were highly symmetrical for both genders (Farré et al., 2020; Goldin, 2022; Lee et al., 2021). Therefore, this study aims at discovering if the pandemic brought about a persistent change in preferences, which translates into changes in the labor market and the road towards gender equality in general. If, on the other hand, no effect is found, then it can be inferred that an economic shock like the Covid-19 pandemic is not sufficient to alter preferences, and as a result, there is no need for further interventions. On top of that, Covid-19 is not only examined for its overall impact on attitudes towards competition, but it is also divided into two subperiods based on the stringency of the measures that the Dutch government took. In this way, it is possible to investigate whether different contexts produce diverse outcomes.

The research also adds to the literature due to its design, which follows a combination of survey data with an exogenous variation in life conditions that further minimizes the power of unobservable characteristics. More specifically, the study focuses on the Netherlands. The rationale behind the choice of one culture allows to somewhat isolate the effect of Covid-19 from other unobservable factors that can influence competitive preferences since it can be safely assumed that the Dutch population has a relatively homogeneous culture (Hoekman et al., 2020). The research approach leverages the Joint European Values Survey / World Values Survey 2017-2022 Dataset. The said dataset is a combination of the European Values Survey

(EVS) that ran in the Netherlands during the two-year period 2017-2018 with the World Values Survey (WVS) and was conducted in the country in January 2022 when the Omicron variant was at its peak. This dataset has been used by many researchers as a proven representative sample (Eber et al., 2021) which addresses external validity concerns coming from the experimental literature, which, thus far, has been the type of research mainly studying the gender gap in competitive preferences. The dataset contains a measure of individual competitive attitudes that has been claimed to effectively replicate results from laboratory experiments and is used as a proxy for competitiveness (Eber et al., 2021; Bönnte, Lombardo and Urbig, 2017; Fortin, 2005).

In the following sections, this report elaborates on the existing literature that motivates this research question (Section 2) and the data and methodology of this study in Section 3. Section 4 analyzes the findings, while Section 5 tests the robustness of the results. The assumptions based on which this study is built are examined in Section 6. The discussion and limitations of this research are mentioned in Section 7 to finally conclude in Section 8.

## 2. Theoretical framework

### 2.1 Covid-19 impact

The outbreak of the pandemic has attracted a lot of interest from the scientific world, especially for its impact on the labor market. Covid-19 was unique due to its disproportional effect on women. In fact, a large body of literature called the crisis a “she-cession”, in contrast to other crises in which men were mostly affected. During the pandemic, however, the overall paid and unpaid work increased substantially for women (Goldin, 2022; Alon et al., 2021; Farré et al., 2020), while mothers experienced a decline in both their working hours and employment (Couch et al., 2021; Petts et al., 2020).

The reasons behind the unequally higher impact of the Covid-19 pandemic on women can be divided into two main categories, as per Albanesi and Kim (2021); demand-side and supply-side reasons. According to the first, the pandemic led to a decline in the demand for service-related jobs, which mainly attract women, because of the measures enacted to control the spread of the virus and the increased consumer fear. The supply-side explanations concern the higher childcare needs that burdened women and required them to exit the labor force.

Indeed, there is strong consensus that the concentration of female workers on vulnerable industries and occupations, along with the “motherhood penalty” were the main culprits for the economic imbalance between men and women (Couch et al., 2021; Petts et al., 2020; Alon et al., 2021; Goldin, 2022). Albanesi and Kim (2021) in quantifying both impacts, find that a third of the total can be attributed to demand factors and the other two thirds to supply ones. The higher contribution of supply-side reasons is suggested to result from either

gender norms or the lower opportunity cost of mothers increasing their unpaid work while decreasing their paid one, as they are very likely to be earning less than fathers.

## **2.2 Gender gap in attitude towards competition**

In the past few years, a large body of literature in economics has turned its attention to the gender gap in competition to shed light on and explain economic outcomes like the gender pay gap. Research examines experimentally competitive differences by measuring either the performance change of men and women from a non-competitive to a competitive condition, and vice versa, or the preference to compete, which is mainly proxied by the option to enter a competition. Both produce the same conclusion; men compete more than women.

The seminal paper by Niederle and Vesterlund (2007) is one of the first to pave the way for investigating gender disparities in competition. Conducting a laboratory experiment, the authors find a 38-percentage points gender gap in the choice to compete. Four possible explanations are tested; men and women have distinct preferences, men showcase higher overconfidence, men are more risk-seeking, and women are more averse to feedback. Only half of the gap can be attributed to the last three reasons, leading the authors to suggest that it is mostly gender differences in preferences that make women less inclined to competition.

Reviewing the experimental literature on the topic, Croson and Gneezy (2009) reach the same conclusion. That is, men are more likely to participate in a competition and perform better as the competitiveness of the setting increases relative to female subjects. In line with Niederle and Vesterlund (2007), the study ascribes much of the differences in the preferences that men and women hold towards competition. In a similar vein, Niederle and Vesterlund (2011), in their review, postulate that laboratory along with field studies find the more favorable attitude towards competition of men to mainly contribute to the gender gap.

Since the empirical evidence points to attitudes as the main reason behind the existence of gender differences in competition, studies have turned to biological or social explanations to explore the origins of such divergence. According to evolutionary psychology, the gender gap in competitive preferences has evolved as a result of natural selection. The economics literature draws from the theory of Darwin (1871) stating that males have developed more competitive traits than females due to the reproductive need for mating; that is, males need to compete for females. On the other hand, female behavior has evolved to secure safe and strong offspring, a process that involves much less competition (Darwin, 1871).

Building on this framework, Flory et al. (2018) concentrate on age and find that there is as much competition difference between younger and older women as there is between younger women and men, channeled through physiological as well as evolutionary mechanisms. Others explore the link between biology and economic preferences. While results do not support a significant relationship between male hormones and competitiveness, an

association cannot be discarded entirely, as there can be other determinants that influence hormones like beliefs and the social environment that can act as a channel for competition (Apicella et al., 2011). Instead, female hormones do influence women's competitive taste, as Wozniak et al. (2014) discover. When women are in the low hormonal cycle, they are more reluctant to compete, while during the high-hormone phase, they show as much willingness to compete as men. Interestingly, gender differences in competitiveness disappear when feedback is introduced, irrespective of the female hormonal phase. Consequently, biology alone cannot explain the large gender gap in competitive preferences.

The inconclusive results presented above point out that evolution alone is not sufficient to explain the gender gap in competitiveness. For that reason, several other studies have resorted to social reasons. Stereotypes and gender norms have been proclaimed as one of the most influential sources of gender differences in competitive attitudes by many articles, either directly when wives earn more than their husbands and when traditional views are adversely related to employment status for women, but not for men (Bertrand et al., 2013; Fortin, 2005), or indirectly through beliefs and internalization of such norms (Bordalo et al., 2019; Bertrand, 2020). Other studies test the role of the environment and its association with competitiveness. For example, it has been found that women in a patriarchal society are less competitive than men, whereas women raised in a matrilineal society exhibit more intense competitiveness in relation to men (Gneezy et al., 2008). Other research conducted in Norway and China has discovered that cultural background and institutions infused with gender-egalitarian views are able to narrow the gender gap in competition taste, indicating that culture is indeed a determinant of the two genders' willingness to compete (Hauge et al., 2023; Zhang, 2018).

The systematic gender discrepancy in competition taste, along with other psychological traits, has been argued to explain gender differences in labor outcomes and why men and women select into different occupations (Buser et al., 2014; Buser, 2019; Cortes and Pan, 2017). The attitude towards competition interacts with the context of work, making certain occupations appeal more to males and others more to females (Cortes and Pan, 2017). That is, men and women evaluate an occupation on a variety of parameters like performance assessment, job stability and security, and degree of competition, and based on their distinct preferences, certain occupations are more attractive than others (Cortes and Pan, 2017).

Additional research on labor outcomes claims that performance differences lead women to dislike competition, which is subsequently translated into lower earnings compared to men, to the degree that these differences extend to the workplace (Gneezy and Rustichini, 2004; Gneezy et al., 2003). Academia has been investigated to demonstrate this effect in a real-world setting. Research has shown that women respond to competitive and stressful contexts in a different way than men, pointing that the former tend to underperform, whereas the latter become more effective (Cai et al., 2019; Morin, 2015).



### **2.3 Effect of Covid-19 on competition taste by gender**

The economic uncertainty surrounding the pandemic is also accompanied by consequences for humans' emotional states, which are closely connected with economic preferences (Loewenstein and Anger, 2003), and norms. Consumers experienced heightened fear due to life risk (Lee et al., 2021) with women feeling more negative emotions than men (Alsharawy et al., 2021). Various indicators of economic uncertainty reached their highest values at the onset of the pandemic (Altig et al., 2020) and economic anxiety related to individual economic situation increased for the U.S. population (Fetzel et al., 2020).

On the gender roles front, lockdowns enhanced stereotypical beliefs around gender roles (Boring et al., 2022), while unemployment during the pandemic period is correlated with changes in the said beliefs within couples (Reichelt et al., 2020). Akerlof and Kranton (2000) unveil how identity affects economic outcomes like the choice of occupation. Gender comprises an identity parameter and as such its potential violation stimulates "anxiety and discomfort" which also impacts preferences, but it can also change preferences to be in line with identity. The pandemic challenged gender roles with a transition to more conservative opinions regarding gender roles, which, as per Akerlof and Kranton (2000) induces feelings of stress. Another manifestation of this mechanism occurs in the workplace. When a woman works at what is a conventionally characterized as a "man's job", she can endure utility loss which influences labor supply (Akerlof and Kranton, 2000). This relationship can also be illustrated in the pandemic context in that preferences for competition changed in order for men and women to maintain the congruency between their identity and occupation.

A few studies have delved into attitude change as a result of exogenous economic shock using the Second World War and study the correlation between preferences and labor outcomes. World War II increased the female labor supply due to the mobilization of men which in turn altered the gender roles in the labor market making work more attractive to women (Alwin et al., 1983; Fernández et al., 2004). According to Alwin et al. (1983), the channel of such preference change can be found in that attitudes towards gender roles constitute a reflection of beliefs about the appropriate behavior that men and women should express in the workplace. This shift further increases the female labor force participation creating a reciprocal relationship between female labor force participation and gender role attitudes. Since there is evidence that the pandemic contributed to the "conservative shift" with men becoming more averse to gender egalitarian views (Boring et al., 2022) and that the female labor supply decreased (Albanesi and Kim, 2021), the reverse association is likely to have occurred. That is, women's work appetite decreased and therefore the preference for competing has decreased as well.

All in all, there is robust evidence that competitive traits are predictors of labor outcomes which were vastly affected by the pandemic. Additionally, channeled through norms, gender role attitudes, and identity, the pandemic has potentially produced long-term

consequences in the labor arena. It created an environment that was especially vulnerable and challenging for women, deeming it very likely that the female competitive preferences have been impacted, potentially reshaping their approach to competition. The already higher willingness of women to pay for jobs that prioritize job stability and flexibility along with that of men who prefer positions that offer a higher wage (Wiswall and Zafar, 2017), further highlight the differences in how men and women perceive competition. As a result, the labor outcomes along with the “conservative shift” in norms experienced during the pandemic are likely to have been translated into a wider gender gap in competition taste ( $H_I$ ).

#### **2.4 Influence of the pandemic context**

The Covid-19 pandemic can be characterized as an economic shock different from other regular economic downturns in that it is unexpected and sudden (Máckowiak and Wiederholt, 2018; Fetzl et al., 2020). Such unique phenomena trigger uncertainty which leads to heightened stress (Adams-Prassl et al., 2020a; Buser et al., 2015). The latter has also been investigated as a source for the gender gap in competitive tastes by testing the gendered competitive response to varying stress levels. While stress does not causally predict neither the willingness to compete nor the gender gap in competitiveness, it is still associated with competition taste (Cahlikova et al., 2020; Buser et al., 2015). It decreases the willingness to compete for both men and women, albeit for different reasons; men change their preferences, while women are affected by psychosocial conditions (Cahlikova et al., 2020). Moreover, since men are already high in competitive traits in contrast to women, it is the latter that shows substantial changes (Buser et al., 2015). According to studies run in academia, negative shocks that affect performance have been found to impact women more than men (Cai et al., 2019), with men becoming more effective compared to women (Morin, 2015).

Apart from the effect of the change itself, the way individuals handle it can further shed light on how attitudes towards competition adjust. Looking at the reactions of men and women after facing a loss, Buser and Yuan (2019) show that women are much less likely to opt to compete. This effect is not mediated by risk preferences, beliefs, feedback, or performance, but rather has a direct impact. There have also been observed gender differences in response to wins and losses, with female performance being affected by past losses in a negative way whereas that of men is influenced only when high stakes are at play (Gill and Prowse, 2014). This is particularly relevant for the present study since the adverse labor outcomes that predominantly affected women can be treated as a loss which further affects their response to subsequent adverse situations.

Although the pandemic is suggested to have widened the gender gap in attitude towards competition as a whole, the evidence indicates that strict measures have a potential stronger impact on women compared to less strict rules. A context characterized by various closures,

such as work closings, can adversely impact female performance in the workplace leading them to become more averse to competition. Men, on the other hand, seem to be more effective when they encounter performance shocks indicating that their taste in competition is much less affected by context. Combining these findings with the fact that the negative consequences of the pandemic were further exacerbated during strict containment measures (Albanesi and Kim, 2021), it can be inferred that very strict contexts have a more pronounced impact exacerbating the existing gender gap in competitive outcomes compared to less stringent ones ( $H_2$ ).

## **2.5 The Dutch context**

The vast majority of literature studying the impact of the Covid-19 pandemic is concentrated in the United States; therefore, it is of the utmost importance to dive into the Dutch context to properly understand the underpinnings of the theoretical mechanisms.

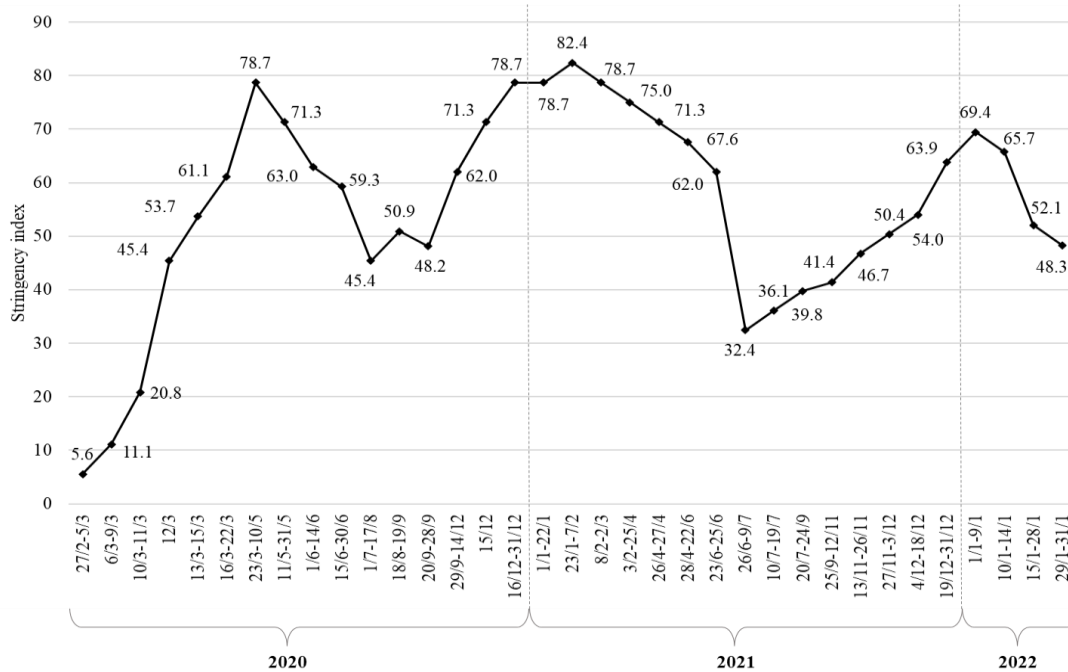
The Netherlands has a relatively homogenous culture, income, and education with decentralized decision-making at the regional level (Hoekman et al., 2020). In 2022, it scored third in the European Union in the gender equality index. With respect to competitive attitudes, the country displays a considerable gender gap in competitive preferences equal to Cohen's  $d$  of 0.3 which is larger than the conventional threshold of 0.2 (Bönte, 2015). However, when comparing the distribution of competitive tastes of men and women, they are very similar, with only 15% of women not being able to be matched with a man of comparable competitive attitude and vice versa (Bönte, 2015).

What distinguishes the Netherlands from other countries is the large share of part-time employment, particularly among women. According to Statistics Netherlands (CBS), around 41.3% of the total Dutch workforce worked part-time in 2022. The female workforce accounts for the lion's share with approximately 65.6% of women having part-time employment contracts. In contrast, only 23.1% of men work part-time each year. The country is also comprised of a workforce that is one of the most digitally skilled, with teleworking being vastly adopted before the outbreak of the pandemic (OECD, 2021), which justifies the rapid implementation of digital initiatives by the Dutch government (Hoekman et al., 2020).

This unique context led to the adoption of different measures and strategies in response to the virus, classified into four different levels based on the degree of severance (Hoekman et al., 2020; Moy et al., 2020). Following an ascending order, these include minimal or recommended measures, medium or mandated policies, significant measures that are mandated and enforced, and very significant ones that concern complete lockdowns. A timeline of the measures as shown by the stringency index -a measure of response policies developed by the Oxford Coronavirus Government Response Tracker (Hale et al., 2021)- is presented in Figure 1. According to the index, with the emergence of the Omicron variant in the last quarter of

2021, the government opted for one of the strictest policies in January 2022 which is the focus of this study (van Dullemen and de Bruijn, 2022; BBC, 2021).

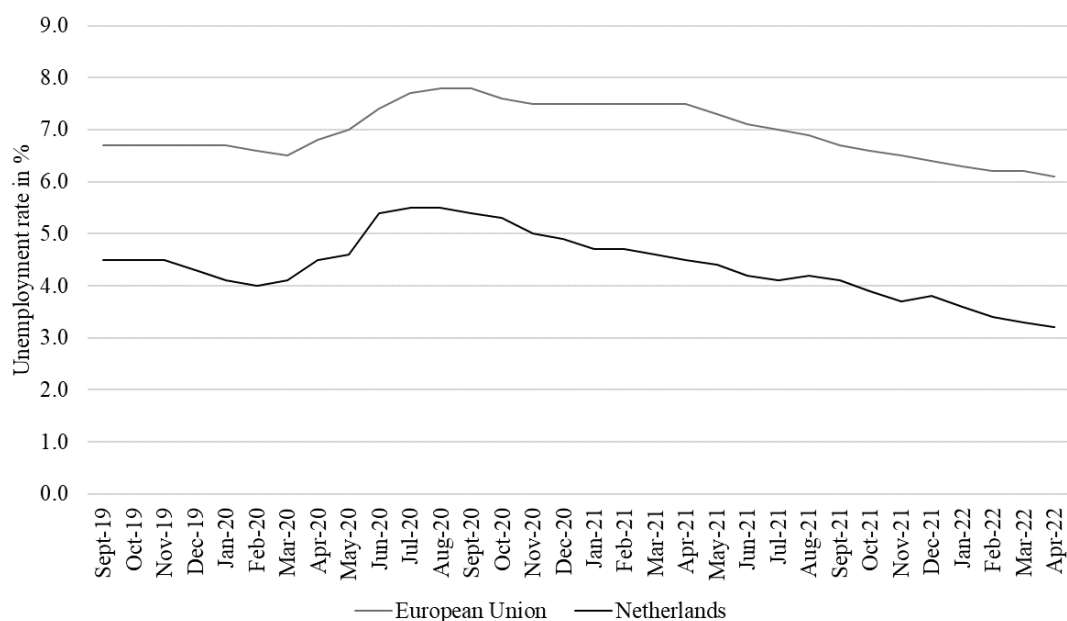
Figure 1. Stringency index, Netherlands



Adapted source: Hale et al., 2021

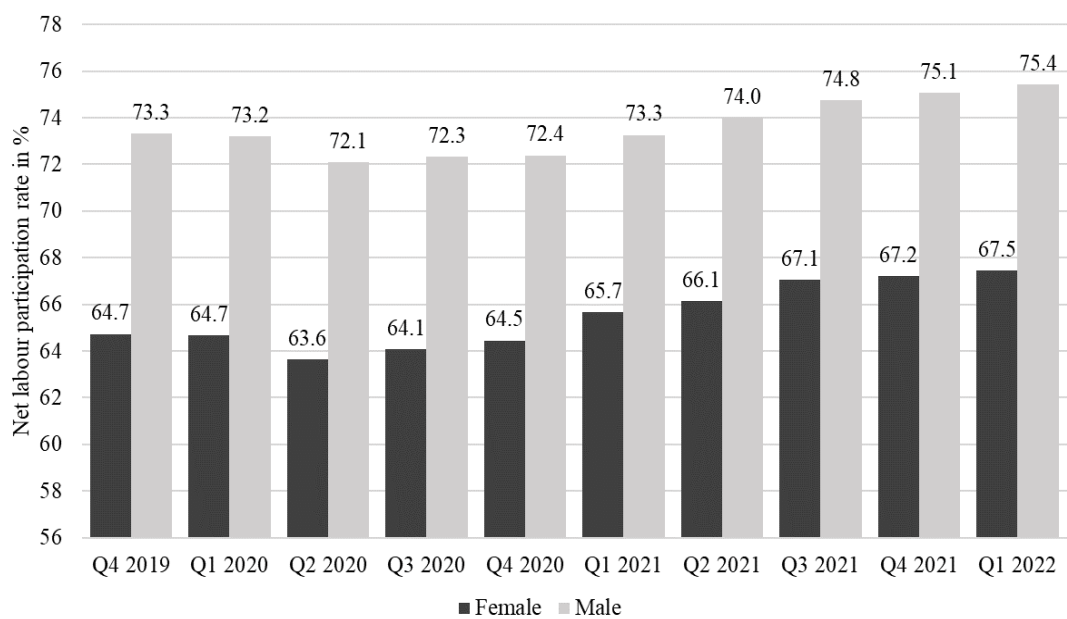
As shown in Figure 2, the unemployment rate peaked during the first months of the pandemic, but it gradually declined right after reaching the pre-pandemic level of approximately 7.0% in July 2021. Interestingly, during the period under study, unemployment in the Netherlands further dropped to around 6.3%. The labor force participation rate followed a similar trend (Figure 3). While it slightly dropped during the descent into the pandemic by the same amount for men and women, it steadily increased surpassing the pre-pandemic level in the first quarter of 2022, when the Omicron variant was spreading. Strikingly, female labor participation recovered faster than that of men. Focusing on the evolution of part-time employment during the pandemic, Figure 4 shows that the descent into the pandemic was marked by an increase in the share of women who worked part-time and a simultaneous decrease in the number of men in part-time employment. From the last quarter of 2020 onwards, the trends reversed reaching the Omicron period with the lowest and highest percentages for females and males, respectively.

Figure 2. Unemployment rate, September 2019-April 2022



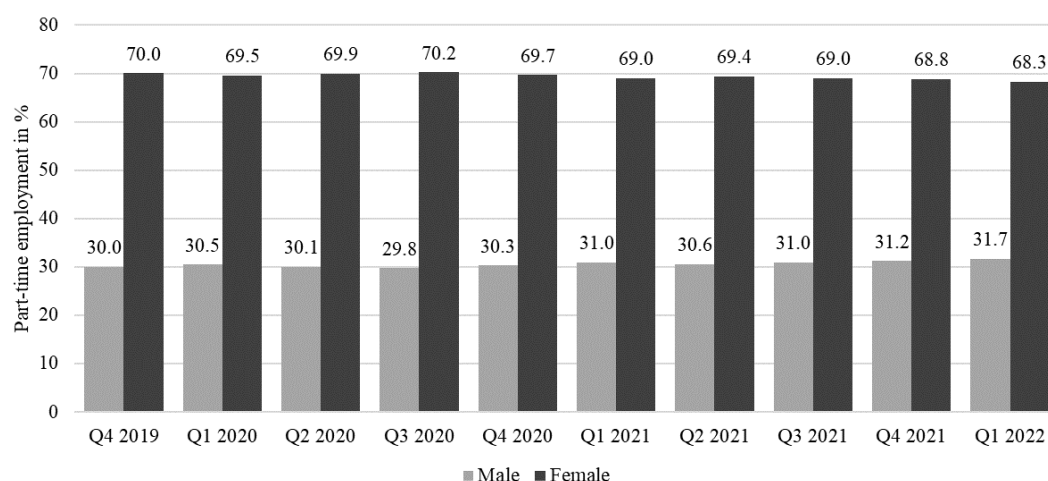
Adapted source: Eurostat

Figure 3. Quarterly net labor participation per gender 2019-2022, Netherlands



Adapted source: Statistics Netherlands (CBS)

Figure 4. Quarterly part-time employment per gender 2019-2022, Netherlands



Adapted source: Statistics Netherlands (CBS)

Gender disparities in employment and hours worked during Covid-19 were relatively small compared to other countries, although women had to disproportionately shoulder work and family duties, more so than in other nations (Alon et al., 2021). However, men reduced their working time more than women to take care of children, demonstrating the largest change in the European Union (Barbieri et al., 2022). Dutch women experienced depression and depression-related symptoms due to the containment policies, contrary to men who felt higher anxiety and anxiety-related symptoms (Vloo et al., 2021). It is noted that the concentration of depression among women is considered to strengthen the gender pay gap (Zhang et al., 2020).

Regarding the influence of the pandemic on the perceptions of the Dutch population, as the amount of women's work increased, the more their views became gender egalitarian. On the other end of the spectrum, for mothers as well as men, gender egalitarian attitudes remained stable (Ivanova et al., 2021). A report evaluating the impact of Covid-19 on Dutch society based on self-reported experience shows that the Dutch felt less fear for job loss relative to almost all the other European countries (More in common, 2020).

### 3. Data and Methodology

In this section, the dataset used in this study is presented in Section 3.1 followed by the description of the competition measure and the two different phases of the Omicron wave in Sections 3.2 and 3.3 respectively, and some descriptive evidence in Section 3.4. Lastly, Section 3.5 introduces the empirical strategy employed to test the association between Covid-19 and its difference phases on the gap in competition attitudes of men and women in the Netherlands.

### **3.1 The Joint European Values Survey / World Values Survey 2017-2022 Dataset**

The 5<sup>th</sup> EVS was run in the Netherlands during 2017 with only respondents aged 18 or older being interviewed. The survey was administered via a random “mixed-mode design”, with part of the sample assigned to computer-assisted personal (face-to-face) interviewing and part following computer-assisted web interviewing.

Table 3.1 exhibits the statistics of the characteristics of the respondents. The mean age is 54 years old, with slightly more than half of the sample (52%) being female. About half of the respondents (54%) are married or live like married, one in four respondents (25%) is single or has never married, 13% are separated or divorced, and 8% are widowed. Among respondents, 48% have one or two children, 29% do not have any children, and 23% have more than three children. The dataset also includes information on respondents' levels of education. 45% of the sample has a higher level of education and the other 55% is equally split between individuals with lower and upper levels of education. Income information is presented on scales ranging from 1 to 10, indicating the lowest and highest income groups in the respondent's country, respectively. Most of the respondents (43%) belong to the middle-income group, 33% report high income, and 24% a low one. 34% of the participants in the EVS are full-time employees, 31% of the respondents have retired, 13% have a part-time employment contract, while the remaining 22% are comprised of self-employed participants, housewives, unemployed respondents, students, and others. The partner's employment status information follows a similar pattern. It is noted that this question does not apply to 38% of the participants.

The 7<sup>th</sup> wave of the WVS took place in January 2022 in the Netherlands with the same approach as the EVS except for the mode of collection, which was only comprised of computer-assisted web interviewing.

The characteristics of participants in the WVS sample are like those of the EVS one. The mean age is 52.3 with 50% female representation. Approximately half of the respondents (47%) have one or two children, 34% do not have children, and 19% have more than 3 children. Half of the WVS sample consists of participants in the middle-income group, while 34% and 17% belong to the high- and low-income scales, respectively. The largest share of the sample (46%) has a full-time employment contract, a fifth (20%) has retired, part-time employment is exercised by 16% of the participants, and the remaining 18% includes respondents that are self-employed, unemployed, and housewives, among other categories.

Differences are observed in educational levels, with a higher percentage of respondents having earned a higher level of education (54%) as well as a middle one (32%), whereas the WVS participants in the lower level are half of those in the EVS. Marital status also differs with respect to the EVS mainly because the WVS includes only two categories; married or living together as married respondents and single ones or ones that have never married. Although,

around the same proportion in the WVS as in the EVS sample is single or has never married (26%), 74% of the respondents have reported being married or living together as married.

Table 3.1. Demographic characteristics, EVS and WVS survey respondents

<i>Study</i> <i>Variable</i>	<b>EVS</b>				<b>WVS</b>			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Female	0.51	0.500	0	1	0.50	0.500	1	2
Age	53.95	16.803	18	82	52.33	15.462	19	82
<i>Marital status</i>								
Married/Living together	0.54	0.499	0	1	0.74	0.437	0	1
Divorced/Separated	0.13	0.336	0	1	n/a	n/a	n/a	n/a
Widowed	0.08	0.272	0	1	n/a	n/a	n/a	n/a
Single/never married	0.25	0.434	0	1	0.26	0.437	0	1
<i>Children</i>								
No child	0.29	0.453	0	1	0.34	0.473	0	1
1 child	0.14	0.343	0	1	0.14	0.344	0	1
2 children	0.35	0.477	0	1	0.33	0.471	0	1
3 children	0.16	0.363	0	1	0.13	0.331	0	1
4 children	0.05	0.213	0	1	0.04	0.202	0	1
more than 5 children	0.02	0.153	0	1	0.02	0.155	0	1
<i>Education</i>								
Lower	0.28	0.449	0	1	0.14	0.346	0	1
Middle	0.27	0.445	0	1	0.32	0.466	0	1
Upper	0.45	0.498	0	1	0.54	0.498	0	1
<i>Income scale</i>								
Low	0.24	0.427	0	1	0.17	0.378	0	1
Middle	0.43	0.495	0	1	0.48	0.500	0	1
High	0.33	0.471	0	1	0.34	0.475	0	1
<i>Employment</i>								
Full time	0.34	0.473	0	1	0.46	0.499	0	1
Part time	0.13	0.336	0	1	0.16	0.371	0	1
Self employed	0.05	0.223	0	1	0.03	0.183	0	1
Retired/pensioned	0.31	0.463	0	1	0.20	0.397	0	1
Housewife	0.05	0.210	0	1	0.04	0.197	0	1
Student	0.03	0.175	0	1	0.02	0.136	0	1
Unemployed	0.03	0.182	0	1	0.04	0.186	0	1
Other	0.06	0.235	0	1	0.05	0.211	0	1
<i>Partner's employment</i>								
Full time	0.23	0.418	0	1	0.33	0.469	0	1
Part time	0.10	0.295	0	1	0.13	0.338	0	1
Self employed	0.04	0.187	0	1	0.03	0.171	0	1
Retired/pensioned	0.18	0.382	0	1	0.16	0.369	0	1
Housewife	0.04	0.207	0	1	0.05	0.222	0	1
Student	0.00	0.056	0	1	0.00	0.055	0	1
Unemployed	0.02	0.123	0	1	0.01	0.112	0	1
Other	0.02	0.133	0	1	0.03	0.160	0	1
Not applicable	0.38	0.486	0	1	0.26	0.437	0	1
Observations	1,877				1,332			

Notes: Table 3.1 shows the demographic statistics of the respondents by survey. The variable name, mean, standard deviation, minimum and maximum are shown respectively.



### **3.2 The measure of attitude towards competition**

To examine the gender gap in competitiveness, the attitude towards competition as measured by the Joint EVS / WVS is leveraged. The surveys ask respondents to give their views on competition on a scale from 1 to 10, in which 1 means that the participant completely agrees with the statement “Competition is good” and 10 means that the respondent completely agrees with the statement “Competition is harmful”. According to previous research, this measure comprises an effective proxy for competition taste which leads to results comparable to the ones found in laboratory experiments (Eber et al., 2021; Bönnte, Lombardo and Urbig, 2017; Fortin, 2005). It has the additional advantage of being independent of context and gender (Eber et al., 2021). Therefore, this statement is used as the dependent variable transformed into a binary one with 1 expressing a positive competitive taste and 0 a negative one. As a robustness check, competition is also treated as an ordered categorical variable with reversed scale to facilitate the interpretation; 1 means fully negative attitude and 10 fully positive one. Please refer to Section 5 for the detailed analysis.

### **3.3 Omicron variant phases**

As mentioned, the effect of Covid-19 on the gender gap in competition is measured through the last wave, during which the Omicron variant was dominating. This period is further divided into two subphases based on the measures that the Dutch government took, which allows to explore whether different environments produce different outcomes.

This categorization is based on the Oxford COVID-19 Government Response Tracker (Hale et al., 2021). The researchers have created a “stringency index” incorporating various governmental measures destined to contaminate the expansion of the virus. Those measures include “school closing, workplace closing, cancellation of public events, restrictions on gathering size, close public transport, stay-at-home requirements, restrictions on internal movement, and restrictions on international travel” (Hale et al., 2021). The index ranges from 0 to 100, with 100 indicating the application of all measures.

According to the tracker, starting on October 5, 2021, the Dutch government initiated stricter measures that peaked during the first month of 2022 to slowly decrease and finally relax in April of the same year (Hale et al., 2021). The WVS was inducted between January 3 and 25, 2022. The stringency index was around 70 during the first 15 days of January and 50 during the last 15 days (Appendix 1). Hence, two subperiods are created. The first refers to the period between the 3rd and 14th of January 2022 when the government implemented strict measures – denoted as the very significant phase based on the classification by Moy et al. (2020)-, while the second involves the last 10 days during which only partial restrictions were in place – mentioned as the medium phase according to Moy et al. (2020).

During the very significant period, the measures were the same for both the vaccinated and the non-vaccinated population. In contrast, for the last days of the month lighter measures were applied for the vaccinated population. The stringency index for the people that received the Covid-19 vaccine was 46.30 compared to 58.23 for the unvaccinated. However, the dataset does not provide information about the vaccination status. Hence, the weighted average of both is considered, although, the difference in the degree of stringency can impact the results, since almost 73% of the Dutch population received at least one dose of the vaccine during the period under study (Mathieu et al., 2020 – updated in April 2023).

### **3.4 Descriptive evidence of the gender gap in competition taste**

Before the outbreak of the pandemic, in line with the literature, a statistically significant gender gap in competition attitudes of around 6.5 percentage points (Table 3.4) is observed. Contrary to the initial hypothesis, the descriptive statistics suggest that Covid-19 increased the competitive taste for both men and women, regardless of the severance of the policies implemented to contain the spread of the Omicron variant. However, a gap persists, even though it is not statistically significant.

More in detail, the percentage of men with a positive competition attitude increased from 67% before Covid-19 to 77% during the very significant phase – a 9.25 percentage point increase. The positive competitive attitudes of women became stronger by 15.60 percentage points, almost vanishing the gender gap in competitiveness. The male attitudes remained stable during the medium phase, whereas those of women became somewhat less favorable in the upcoming phase characterized by less stringent measures. This led to a wider gap equal to 3.02 percentage points. However, it remains half of that observed before the pandemic.

This opposite evidence can be linked to Cárdenas et al. (2011) who suggest that while men are more inclined towards competition generally, women are more likely to opt to compete in certain situations. At the same time, Adams-Prassl et al. (2020) focus on diverse countries and highlight the decisive role of working from home opportunities and policies in preventing mass job and earnings losses. Since the Netherlands was already widely offering the opportunity to work from home, the pandemic could have impacted the mechanisms of preference change in a different way leading to opposite results.

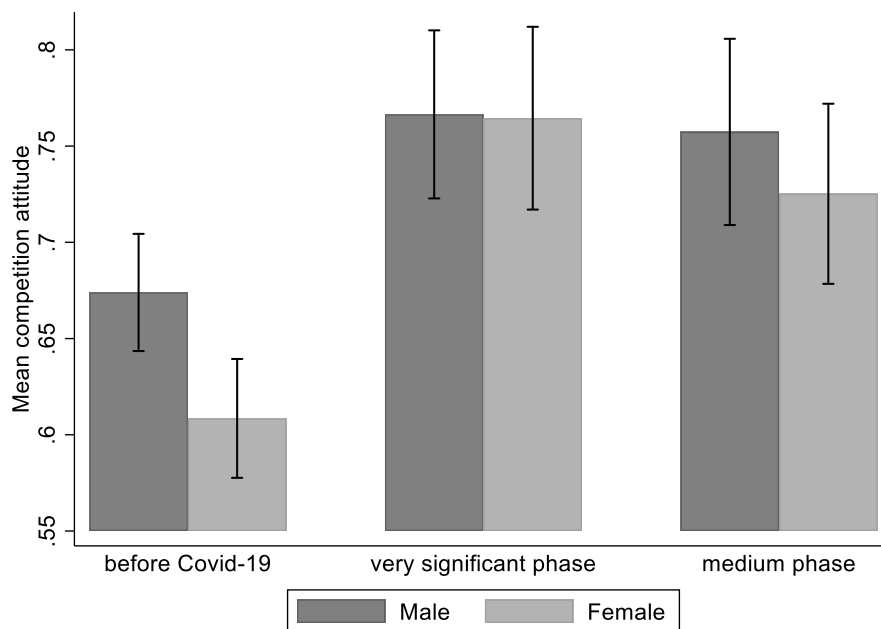
Overall, the pandemic intensified the competitive preferences of Dutch men and women ultimately narrowing the gap, while the gender gap in competitiveness indeed depends on the severity of the phase, albeit in the opposite directions than those initially hypothesized, as can be visually seen by the descriptive Figure 4 below.

Table 3.4. Descriptive statistics, before and during Covid-19, by gender

	Before Covid-19			During Covid-19					
	Mean		t-test	Very significant phase			Medium phase		
	Male	Female	$\Delta$	Male	Female	$\Delta$	Male	Female	$\Delta$
Competition	0.67	0.61	0.065***	0.77	0.76	0.002	0.76	0.73	0.032

Notes: Table 3.4 shows descriptive statistics for the outcome variable, which is a binary one with 0 expressing negative attitude and 1 indicating positive taste, by gender.  $\Delta$  denotes the difference between the competition taste of male and female respondents. Significance is calculated based on a two-sided t-test: \*\*\*1% significance; \*\*5% significance; \*10% significance.

Figure 4. Mean competition attitude before and during different Covid-19 phases, by gender



Notes: Figure 4 shows the mean attitude towards competition before and during the very significant and medium Omicron variant phases and by gender. Bars represent 95% confidence intervals.

### 3.5 Empirical strategy

The key purpose of the present study is to identify whether the emergence of the Omicron variant as well as the different contexts created to limit its spread influence men and women's views towards competition. To answer this research question, two regressions are estimated employing the Ordinary Least Squares (OLS) method, each corresponding to the two hypotheses  $H_1$  and  $H_2$  (Section 2).

The first regression (1) concerns the general impact of the Omicron wave, while the second (2) tests the effect of the very significant and medium phases on the gender gap in competition taste as follows:

$$\text{Competition}_{it} = \alpha + \beta_1 \text{Female}_i + \beta_2 \text{Covid}_t + \beta_3 \text{Female}_i * \text{Covid}_t + X_{it} + \varepsilon_{it}, \quad (1)$$

$$\text{Competition}_{it} = \alpha + \beta_1 \text{Female}_i + \beta_2 \text{Significant}_t + \beta_3 \text{Medium}_t + \beta_4 \text{Female}_i * \text{Significant}_t + \beta_5 \text{Female}_i * \text{Medium}_t + X_{it} + \varepsilon_{it}, \quad (2)$$

where the dependent variable  $\text{Competition}_{it}$  is a binary one with 1 indicating positive taste of respondent  $i$  and 0 a negative one at time  $t$ . Female is a binary variable representing the gender of the respondents and equals 1 if they are female and 0 if they are male.

In regression (1), Covid is a binary variable that takes the value 0 for the period before Covid-19 - for responses given in the EVS- and 1 for the period during the pandemic -for January 2022 when the WVS was administered to the Dutch participants. The coefficient of the interaction term ( $\beta_3$ ) determines the impact of the pandemic on the gender gap in competitiveness. Regarding regression (2), variables Significant and Medium are binary equal to 0 for the period before Covid-19 and 1 if the responses were recorded during the very significant or medium phase of the Omicron variant, respectively. The coefficients of the interaction terms ( $\beta_4$  and  $\beta_5$ ) measure the impact of the two phases on competition.

In both regressions,  $X_{it}$  is a vector of all the control variables related to respondents' characteristics and fixed effects. The first includes age, education, marital status, income, employment status, partner's employment status and children, while the latter contains month, mode of collection and region fixed effects. Standard errors are clustered at the regional level since it is suggested that the country has decentralized decision-making by region (Hoekman et al., 2020). Finally,  $\varepsilon_{it}$  is the error term.

It is worth noting that although the present study uses a representative dataset and a plethora of control variables, caution is taken in causally interpreting the results, due to the possibility that unobservable characteristics affect the outcomes.

## 4. Did Covid-19 change the gender gap in competition attitudes?

The main conjecture concerns the effect of the Omicron variant on the competitive attitudes of Dutch men and women and whether the effect was different between the very significant and the medium phase. The results are analyzed below.

### 4.1 Impact of the 4<sup>th</sup> Covid-19 wave

Table 4.1 presents the results of the first hypothesis according to which the 4<sup>th</sup> Covid-19 wave widened the gender gap in the attitudes towards competition. First, in line with literature, all 5 specifications confirm a statistically significant gender gap in competition taste

equal to 6.14 percentage points, on average; that is, Dutch women are 6.14 percentage points less likely to view competition positively than men, keeping all other things constant.

Focusing on the overall effect of the Omicron variant, the first 4 specifications find a statistically significant positive impact of Covid-19 on the competition taste of both genders. According to the results, male and female respondents became 8.85 percentage points, on average, more likely to view competition positively. This effect contrasts the original hypothesis that the uncertain environment that Covid-19 created adversely altered the competitive preferences, and predominantly those of women. However, the situation changes when month fixed effects are introduced into the model and the impact of Covid-19 becomes insignificant.

Looking specifically at the effect of the pandemic's 4<sup>th</sup> wave on the gender gap in competition, against what was initially expected, there is no relationship between the pandemic and the gender gap in competitive preferences. The coefficient of the interaction term between the gender of the respondent and the pandemic state in all different specifications is positive but statistically insignificant. This finding is in line with research that concludes that the pandemic effects depend more on the educational level and less on gender, while the negative consequences are mainly short-lived and do not seem to persist once during the pandemic (Farré et al., 2020; Goldin, 2022; Lee et al., 2021), presumably because of belief updating and alternative mitigation methods (Lee et al., 2021).

Table 4.1. Impact of the 4<sup>th</sup> Covid-19 wave on the gender gap in competition taste

Statement	"Competition is good"				
Dependent variable	Agreement with Statement				
	(1)	(2)	(3)	(4)	(5)
Female	-0.0654*** (0.0199)	-0.0617*** (0.0183)	-0.0616*** (0.0180)	-0.0592*** (0.0189)	-0.0598*** (0.0179)
Covid-19	0.0884*** (0.0191)	0.0874*** (0.0203)	0.0891*** (0.0207)	0.0892*** (0.0204)	0.0461 (0.0560)
Female x Covid-19	0.0467 (0.0328)	0.0421 (0.0310)	0.0420 (0.0309)	0.0379 (0.0314)	0.0380 (0.0304)
Constant	0.6740 (0.0104)	0.6894 (0.0633)	0.6916 (0.0642)	0.9520 (0.0616)	1.0461 (0.0941)
Controls	No	Yes	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
Month fixed effects	No	No	No	No	Yes
Observations	3,209	3,209	3,209	3,209	3,209
R <sup>2</sup>	0.0174	0.0407	0.0408	0.0435	0.0462

Notes: The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful". Column (1) presents the results of the baseline regression specification. In column (2), the demographic characteristics of the respondents are included as control variables; income, education, age, marital status, employment status, partner's employment status, and children. Column (3) adds mode of data

collection fixed effects and column (4) adds region fixed effects. In column (5), fixed effects of the month the interview was conducted are also included. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## 4.2 Impact of the medium and very significant phases

After finding that the Omicron variant, overall, did not influence the gender gap in the attitude towards competition, I now turn to the two different phases in which January 2022 can be divided in order to see whether the same results hold when different containment contexts are considered. Table 4.2 reports a similar general trend.

Gender remains a determinant for competition attitudes, with women reporting less a positive attitude of about 6.14 percentage points, on average, than men. As above, the context appears to strengthen the competitive tastes of men and women in the Netherlands, although the effect becomes insignificant once month fixed effects are incorporated into the model. It is worth mentioning that the findings indicate a stronger positive effect of the very significant phase -approximately 8.51 percentage points- compared to the medium one, which equals around 7.38 percentage points.

With respect to the interaction of gender and context, as concluded above, the gender gap is not associated with the medium phase; the coefficients of the interaction term are not statistically significant in any of the 5 specifications. The medium phase evolved during the last half of January 2022, right after the mitigation policies hit a peak in terms of stringency. On top of that, measures differed based on the vaccination status; the vaccinated Dutch population was imposed more relaxed policies relative to the unvaccinated one (Hale et al., 2021). Given the high share of people in the Netherlands that received the vaccine -around 72.5% according to Mathieu et al. (2023)- it is very likely that a large share of the population was not affected.

Strikingly, the same cannot be said about the very significant phase. Being female during the very significant phase of the Omicron variant increased the competitive attitude by 5.89 percentage points on average, all else being constant. Therefore, it seems that the very significant phase impacted the gender gap in competitiveness but in the opposite direction. Instead of widening the gap, this environment, with its unique characteristics that are suggested to reduce the competitive taste of women (Cahlikova et al., 2020; Buser and Yuan, 2019; Adams-Prassl et al., 2020a; Buser et al., 2015), closed it. However, given that this phase came first and the medium one followed, one can assume that the effect was rather temporary, not reflecting a permanent preference change with long-lasting labor consequences.

A potential explanation for this unexpected result revolves around the concept of remote work. The ability to work remotely in fact allowed women to balance work with family (Hansen et al., 2022), while this opportunity mostly applied to female employees in Spain (Farré et al., 2020). As mentioned in Section 2.5, the Netherlands is comprised of one of the

most digitally skilled countries worldwide. As such, remote work may have eliminated identity and gender role concerns that may exist in traditional work settings ultimately aligning the competitive preferences of men and women. Stress offers an additional interpretation. While it has previously been mentioned that stress decreases women’s willingness to compete, Buser et al. (2015) have found that when females have already entered a competitive condition, the higher the level of the stress hormone, the greater the willingness to compete. What is more, when an environment eventually becomes competitive enough, the competitive preferences of both genders increase, as another study shows (Johnsen et al., 2023). However, the gap still persists as the increase in men's attitudes is higher than that of women (Johnsen et al., 2023).

It needs to be mentioned that the coefficient of the interaction term is statistically significant at the 10% level and less precisely estimated with a large confident interval. Furthermore, this result is not completely robust to alternative estimation methods and treatments of the dependent variable, as Section 5 shows. These remarks could explain the inconsistent result regarding the effect of context on the gender gap in competition.

Table 4.2. Impact of medium and very significant phases on the gender gap in competition taste

Statement Dependent variable	"Competition is good"				
	Agreement with Statement				
	(1)	(2)	(3)	(4)	(5)
Female	-0.0654*** (0.0199)	-0.0615*** (0.0182)	-0.0614*** (0.0178)	-0.0590*** (0.0188)	-0.0596*** (0.0178)
Medium	0.0834*** (0.0203)	0.0818*** (0.0166)	0.0835*** (0.0160)	0.0817*** (0.0155)	0.0388 (0.0533)
Very significant	0.0925*** (0.0247)	0.0918*** (0.0274)	0.0935*** (0.0282)	0.0951*** (0.0284)	0.0526 (0.0606)
Female x Medium	0.0333 (0.0501)	0.0272 (0.0446)	0.0271 (0.0445)	0.0251 (0.0450)	0.0253 (0.0441)
Female x Very significant	0.0635** (0.0247)	0.0608** (0.0263)	0.0608** (0.0262)	0.0547* (0.0264)	0.0548* (0.0256)
Constant	0.6740 (0.0104)	0.6884 (0.0636)	0.6906 (0.0646)	0.9553 (0.0592)	1.0491 (0.0919)
Controls	No	Yes	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
Month fixed effects	No	No	No	No	Yes
Observations	3,209	3,209	3,209	3,209	3,209
R <sup>2</sup>	0.0178	0.0412	0.0412	0.0440	0.0467

Notes: The dependent variable is a binary variable equal to 1 if the respondents agree with the statement “Competition is good” and 0 if the respondents agree with the statement “Competition is harmful”. Column (1) presents the results of the baseline regression specification. In column (2), the demographic characteristics of the respondents are included as control variables; income, education, age, marital status, employment status, partner’s employment status, and children. Column (3) adds mode of data collection fixed effects and column (4) adds region fixed effects. In column (5), fixed effects of the month the interview was conducted are also included. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Overall, either the Omicron variant as a whole or its different phases do not seem to be associated with the gender gap in attitudes towards competition. The results reveal a statistically insignificant positive relationship that contradicts the hypotheses originally developed. Drawing from Cárdenas et al. (2011), the exogenous shock of Covid-19 did not affect the channels of competitive preference change, which are hypothesized to be formed following a different process than other economic preferences. Furthermore, the already well-established working from home option may have left performance intact, ultimately not altering the taste competition (Gneezy et al., 2003; Gneezy and Rustichini, 2004). On the other hand, the fact that once month-fixed effects are included in the model, the effects of the Omicron variant and the very significant and medium phases disappear, implying that intensity impacted tastes more than Covid-19. Since the influence of the pandemic is tested through the respondents participating in the WVS that took place only in January 2022, while the pre-pandemic preferences were measured during a period of two years, important differences in the labor market between months are highly likely to drive the relationship instead.

## 5. Robustness

The estimations presented above rely on the transformation of the dependent variable from a scale ranging from 1 to 10 into a binary one and on OLS as the empirical strategy. In this Section, additional analyses are displayed so as to test the robustness of the results to alternative empirical strategies and treatment of the dependent variable.

### 5.1. Competition as an ordered categorical variable with OLS estimation

First, the initial scale of the competition variable is kept but in the reverse order so that 1 denotes a fully negative attitude towards competition and 10 a fully positive one. The effect is estimated with the OLS method because the variable follows a normal distribution, and the scale is very large. In Section 5.3, an ordered probit estimation method is employed, as well.

Table 5.1.1 below showcases similar results as the ones estimated in the benchmark empirical strategy (Section 4.1, Table 4.1). There is no relationship between the fourth pandemic wave and the gender gap in the taste for competition.

Regarding the impact of the two phases of the Omicron variant, compared to the main analysis (Section 4.2, Table 4.2) the coefficient of the interaction between the very significant period and the gender of the respondent is not significant in statistical terms and opposite in sign (Table 5.1.2). It is worth mentioning that the full specification (5) in the benchmark analysis (Section 4.2, Table 4.2) gives imprecise estimates. All other estimates are comparable to those in the main results.



Table 5.1.1. Impact of the 4<sup>th</sup> Covid-19 wave on the gender gap in competition taste

Statement	"Competition is good"				
Dependent variable	Agreement with Statement				
	(1)	(2)	(3)	(4)	(5)
Female	-0.4077*** (0.0548)	-0.4180*** (0.0607)	-0.4207*** (0.0599)	-0.4120*** (0.0602)	-0.4144*** (0.0600)
Covid-19	0.2934*** (0.0635)	0.2858*** (0.0706)	0.2548*** (0.0691)	0.2526*** (0.0675)	-0.0650 (0.2695)
Female x Covid-19	0.0106 (0.0971)	-0.0078 (0.0917)	-0.0067 (0.0917)	-0.0246 (0.0882)	-0.0243 (0.0859)
Constant	6.3195 (0.0364)	6.3499 (0.1866)	6.3084 (0.193)	7.3475 (0.2166)	7.8326 (0.457)
Controls	No	Yes	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
Month fixed effects	No	No	No	No	Yes
Observations	3,209	3,209	3,209	3,209	3,209
R <sup>2</sup>	0.0180	0.0441	0.0444	0.0478	0.0495

Notes: The dependent variable is an ordered categorical one ranging from 1 in case of a fully negative competition taste to 10 in case of a fully positive one. Column (1) presents the results of the baseline regression specification. In column (2), education, age, marital status, employment status, partner's employment status, and children are included as control variables. Column (3) adds mode of data collection fixed effects and column (4) adds region fixed effects. In column (5), fixed effects of the month the interview was conducted are also included. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 5.1.2. Impact of medium and very significant phases on the gender gap in competition taste

Statement	"Competition is good"				
Dependent variable	Agreement with Statement				
	(1)	(2)	(3)	(4)	(5)
Female	-0.4077*** (0.0548)	-0.4171*** (0.0611)	-0.4198*** (0.0602)	-0.4115*** (0.0607)	-0.4138*** (0.0605)
Medium	0.1690** (0.0728)	0.1606** (0.0709)	0.1284* (0.0642)	0.1169* (0.0649)	-0.1978 (0.2265)
Very significant	0.3976*** (0.1083)	0.3886*** (0.1167)	0.3577** (0.1186)	0.3626** (0.1177)	0.0484 (0.3145)
Female x Medium	0.1345 (0.1732)	0.1047 (0.1673)	0.1068 (0.1668)	0.0989 (0.17)	0.0995 (0.1665)
Female x Very significant	-0.0932 (0.1248)	-0.0996 (0.1184)	-0.0992 (0.1189)	-0.1252 (0.108)	-0.1251 (0.1099)
Constant	6.3195 (0.0364)	6.3545 (0.186)	6.3124 (0.1921)	7.3396 (0.2191)	7.8225 (0.4618)
Controls	No	Yes	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
Month fixed effects	No	No	No	No	Yes
Observations	3,209	3,209	3,209	3,209	3,209
R <sup>2</sup>	0.0187	0.0449	0.0452	0.0486	0.0504

Notes: The dependent variable is an ordered categorical one ranging from 1 in case of a fully negative competition taste to 10 in case of a fully positive one. Column (1) presents the results of the baseline

regression specification. In column (2), education, age, marital status, employment status, partner's employment status, and children are included as control variables. Column (3) adds mode of data collection fixed effects and column (4) adds region fixed effects. In column (5), fixed effects of the month the interview was conducted are also included. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## 5.2. Logit estimation

A logit model is also run with competition being a binary variable. Altogether, both analyses (Table 5.2.1 and Table 5.2.2) provide estimates that are similar in size and significance as the ones presented in the benchmark method (Section 4.1, Table 4.1; Section 4.2, Table 4.2). Please refer to Appendix 2 for a display of the corresponding average marginal effects.

Table 5.2.1. Impact of the 4<sup>th</sup> Covid-19 wave on the gender gap in competition taste

Statement Dependent variable	"Competition is good"				
	Agreement with Statement				
	(1)	(2)	(3)	(4)	(5)
Female	-0.2851*** (0.0862)	-0.2774*** (0.0795)	-0.2768*** (0.0779)	-0.2667*** (0.0818)	-0.2681*** (0.0781)
Covid-19	0.4394*** (0.0993)	0.4464*** (0.1037)	0.4526*** (0.1059)	0.4545*** (0.1054)	0.2183 (0.3191)
Female x Covid-19	0.1843 (0.1587)	0.1688 (0.1512)	0.1686 (0.1506)	0.1450 (0.1534)	0.1447 (0.1497)
Constant	0.7262 (0.0472)	0.8470 (0.3136)	0.8551 (0.3158)	1.1403 (0.3566)	1.6110 (0.5526)
Controls	No	Yes	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
Month fixed effects	No	No	No	No	Yes
Observations	3,209	3,209	3,209	3,202	3,198
Pseudo R <sup>2</sup>	0.0141	0.0330	0.0330	0.0345	0.0363

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful". Column (1) presents the results of the baseline regression specification. In column (2), the demographic characteristics of the respondents are included as control variables; education, age, marital status, employment status, partner's employment status, and children. Column (3) adds mode of data collection fixed effects and column (4) adds region fixed effects. In column (5), fixed effects of the month the interview was conducted are also included. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 5.2.2. Impact of medium and very significant phases on the gender gap in competition taste

Statement	"Competition is good"				
Dependent variable	Agreement with Statement				
	(1)	(2)	(3)	(4)	(5)
Female	-0.2851*** (0.0862)	-0.2764*** (0.0789)	-0.2758*** (0.0773)	-0.2660*** (0.0813)	-0.2673*** (0.0776)
Medium	0.4122*** (0.1037)	0.4163*** (0.0851)	0.4226*** (0.0827)	0.4144*** (0.0809)	0.1790 (0.3057)
Very significant	0.4624*** (0.1337)	0.4705*** (0.1459)	0.4765*** (0.1498)	0.4865*** (0.1516)	0.2528 (0.3434)
Female x Medium	0.1172 (0.2463)	0.0916 (0.2233)	0.0912 (0.2226)	0.0782 (0.2249)	0.0784 (0.2219)
Female x Very significant	0.2741** (0.1213)	0.2717** (0.129)	0.2716** (0.1288)	0.2388* (0.1304)	0.2383* (0.1275)
Constant	0.7262 (0.0472)	0.8432 (0.3154)	0.8512 (0.3179)	1.1334 (0.3608)	1.6028 (0.5567)
Controls	No	Yes	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
Month fixed effects	No	No	No	No	Yes
Observations	3,209	3,209	3,209	3,202	3,198
Pseudo R <sup>2</sup>	0.0144	0.0334	0.0334	0.0350	0.0367

Notes: The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful". Column (1) presents the results of the baseline regression specification. In column (2), the demographic characteristics of the respondents are included as control variables; education, age, marital status, employment status, partner's employment status, and children. Column (3) adds mode of data collection fixed effects and column (4) adds region fixed effects. In column (5), fixed effects of the month the interview was conducted are also included. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

### 5.3. Competition as an ordered categorical variable with ordered probit estimation

Here, competition is treated as an ordered categorical variable and an ordered probit model is used to estimate the effect of the Omicron variant as a whole and its two sub-phases on the gender gap in competition taste.

Similar to the findings of Section 5.1 above, keeping competition in the form of scale gives comparative results with the benchmark analysis. The two exceptions are the sign of the Covid-19 variable in the last specification which is negative but still insignificant (Table 5.3.1, column (5)), and the effect of the very significant phase on gender gap in competition taste that is not significant in any of the specifications and negative (Table 5.3.2). For the average marginal effects, please refer to Appendix 3.

Table 5.3.1. Impact of the 4<sup>th</sup> Covid-19 wave on the gender gap in competition taste

Statement	"Competition is good"				
Dependent variable	Agreement with Statement				
	(1)	(2)	(3)	(4)	(5)
Female	-0.2290*** (0.0303)	-0.2376*** (0.0348)	-0.2388*** (0.0343)	-0.2342*** (0.0344)	-0.2356*** (0.0343)
Covid-19	0.1661*** (0.0366)	0.1660*** (0.0404)	0.1524*** (0.039)	0.1516*** (0.0381)	-0.0159 (0.1483)
Female x Covid-19	-0.0051 (0.0514)	-0.0153 (0.0487)	-0.0148 (0.0487)	-0.0250 (0.0464)	-0.0250 (0.0452)
Controls	No	Yes	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
Month fixed effects	No	No	No	No	Yes
Observations	3,209	3,209	3,209	3,202	3,198
Pseudo R <sup>2</sup>	0.0048	0.0114	0.0115	0.0123	0.0128

*Notes:* The dependent variable is an ordered categorical variable ranging from 1 if the respondents have a fully negative competition taste to 10 if they have a fully positive competition taste. Column (1) presents the results of the baseline regression specification. In column (2), the demographic characteristics of the respondents are included as control variables; education, age, marital status, employment status, partner's employment status, and children. Column (3) adds mode of data collection fixed effects and column (4) adds region fixed effects. In column (5), fixed effects of the month the interview was conducted are also included. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 5.3.2. Impact of medium and very significant phases on the gender gap in competition taste

Statement	"Competition is good"				
Dependent variable	Agreement with Statement				
	(1)	(2)	(3)	(4)	(5)
Female	-0.2291*** (0.0303)	-0.2372*** (0.035)	-0.2384*** (0.0345)	-0.2340*** (0.0348)	-0.2353*** (0.0346)
Medium	0.0928** (0.0415)	0.0913** (0.0405)	0.0770** (0.036)	0.0709* (0.0367)	-0.0949 (0.1243)
Very significant	0.2280*** (0.0637)	0.2278*** (0.0684)	0.2141*** (0.0693)	0.2175*** (0.0688)	0.0520 (0.1749)
Female x Medium	0.0671 (0.0946)	0.0519 (0.0918)	0.0529 (0.0915)	0.0482 (0.0933)	0.0483 (0.0913)
Female x Very significant	-0.0656 (0.0717)	-0.0705 (0.0691)	-0.0702 (0.0692)	-0.0849 (0.063)	-0.0850 (0.0642)
Controls	No	Yes	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
Month fixed effects	No	No	No	No	Yes
Observations	3,209	3,209	3,209	3,202	3,198
Pseudo R <sup>2</sup>	0.0050	0.0116	0.0117	0.0126	0.0131

*Notes:* The dependent variable is an ordered categorical variable ranging from 1 if the respondents have a fully negative competition taste to 10 if they have a fully positive competition taste. Column (1) presents the results of the baseline regression specification. In column (2), the demographic characteristics of the respondents are included as control variables; education, age, marital status,

employment status, partner's employment status, and children. Column (3) adds mode of data collection fixed effects and column (4) adds region fixed effects. In column (5), fixed effects of the month the interview was conducted are also included. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

#### 5.4. Two gender-based subsamples

Finally, instead of running the OLS regression on the whole sample, two separate regressions are used; one for the female group and one for the male group.

Regarding the first hypothesis (Table 5.4.1), estimates are similar to the benchmark ones with the only exception of the negative sign of the Covid-19 coefficient for the female group, which nevertheless remains statistically insignificant. The sign, but not the statistical significance, of the very significant phase (Table 5.4.2) is another difference; it is negative for females.

Table 5.4.1. Impact of the 4<sup>th</sup> Covid-19 wave on the gender gap in competition taste

Statement	"Competition is good"				
Dependent variable	Agreement with Statement				
<i>Panel A: Females</i>					
	(1)	(2)	(3)	(4)	(5)
Covid-19	0.1351***	0.137***	0.1462***	0.1411***	-0.0426
	-0.025	-0.0292	-0.031	-0.0312	-0.0901
Constant	0.6085	0.5738	0.5908	0.8675	1.0975
	-0.0146	-0.0591	-0.0567	-0.0658	-0.1411
Controls	No	Yes	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
Month fixed effects	No	No	No	No	Yes
Observations	1,626	1,626	1,626	1,626	1,626
R <sup>2</sup>	0.0197	0.0448	0.0452	0.052	0.0564
<i>Panel B: Males</i>					
	(1)	(2)	(3)	(4)	(5)
Covid-19	0.0884***	0.0838***	0.0777***	0.0784***	0.1492
	-0.0191	-0.0233	-0.0241	-0.0243	-0.1136
Constant	0.674	0.7713	0.7654	0.8727	0.8515
	-0.0104	-0.0655	-0.0701	-0.0613	-0.1274
Controls	No	Yes	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
Month fixed effects	No	No	No	No	Yes
Observations	1,583	1,583	1,583	1,583	1,583
R <sup>2</sup>	0.0093	0.0446	0.0448	0.0471	0.049

Notes: The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful".

Column (1) presents the results of the baseline regression specification. In column (2), the demographic characteristics of the respondents are included as control variables. Column (3) adds mode of data collection fixed effects and column (4) adds region fixed effects. In column (5), fixed effects of the month the interview was conducted are also included. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 5.4.2. Impact of medium and very significant phases on the gender gap in competition taste

Statement	"Competition is good"				
Dependent variable	Agreement with Statement				
<i>Panel A: Females</i>					
	(1)	(2)	(3)	(4)	(5)
Medium	0.1167***	0.1143***	0.1235***	0.1178***	-0.0655
	-0.0323	-0.0313	-0.0328	-0.0329	-0.0778
Very significant	0.156***	0.1626***	0.1717***	0.1671***	-0.0161
	-0.0269	-0.0365	-0.0381	-0.0381	-0.1044
Constant	0.6085	0.5717	0.5886	0.8725	1.1023
	-0.0146	-0.0593	-0.0567	-0.062	-0.1372
Controls	No	Yes	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
Month fixed effects	No	No	No	No	Yes
Observations	1,626	1,626	1,626	1,626	1,626
R <sup>2</sup>	0.0204	0.0459	0.0462	0.0531	0.0575
<i>Panel B: Males</i>					
	(1)	(2)	(3)	(4)	(5)
Medium	0.0834***	0.0788***	0.0724***	0.0721***	0.1429
	-0.0203	-0.0175	-0.0161	-0.016	-0.1105
Very significant	0.0925***	0.0879**	0.0819**	0.0833**	0.1548
	-0.0247	-0.0311	-0.0325	-0.033	-0.1175
Constant	0.674	0.7718	0.7658	0.868	0.8464
	-0.0104	-0.0654	-0.07	-0.0608	-0.1304
Controls	No	Yes	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
Month fixed effects	No	No	No	No	Yes
Observations	1,583	1,583	1,583	1,583	1,583
R <sup>2</sup>	0.0093	0.0447	0.0449	0.0472	0.049

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful". Column (1) presents the results of the baseline regression specification. In column (2), the demographic characteristics of the respondents are included as control variables. Column (3) adds mode of data collection fixed effects and column (4) adds region fixed effects. In column (5), fixed effects of the month

the interview was conducted are also included. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Overall, few differences are observed when the dependent variable “Competition” is treated as an ordered categorical variable instead of a binary one. The most pronounced one concerns the impact of the very significant phase on the gender gap in competition. In the benchmark method, the said coefficient has a positive statistically significant relationship with the gender gap. When competition is in scale form, no effect is observed. This deviation is mainly driven by the fact that the first focuses on the gender gap in the competitive attitudes, which are either positive or negative before and during the pandemic. It is, thus, not interested in exploring the specific individual preferences of men and women, as is the case with the methods presented in Sections 5.1 and 5.3. What is more, this discrepancy is very uncertain given that in the benchmark results, the estimate is imprecise with a wide confidence interval that includes 0. Finally, any differences between the main analysis and the estimation method that uses two samples by gender are likely attributed to the latter, assuming that gender interacts with all covariates. However, this study aims to examine whether there is a heterogeneous effect for males and females on competitive attitudes for one variable; the fourth wave and its two different phases. Therefore, this method is probably not the most suitable one.

## 6. Assessing the assumptions

The rationale behind the investigation of the potential shift in the gender gap in attitudes towards competition during the fourth wave of Covid-19 is twofold. On the one hand, competition taste has been linked to labor outcomes like income and promotions (Buser, 2019). Therefore, a potential shift in this economic preference would ultimately mean a change in the labor market. On the other hand, focusing on the last wave adds value as to whether preference changes persist. Initial findings about Covid-19 find evidence in favor of a differential treatment for working mothers and for those occupied in the service sector (Couch et al., 2021; Petts et al., 2020; Albanesi and Kim, 2021). However, subsequent studies support that these consequences concerned mainly the descent into the pandemic, while later, both genders faced the same labor outcomes (Farré et al., 2020; Goldin, 2022; Lee et al., 2021).

The main result of this study is that neither the Omicron variant period nor the two different phases into which it can be divided impacted the gender gap in competition taste. Yet, given the motivations that drove the present study, it is essential to further explore the effect in that regard. Hence, Section 6.1 adds the service sector as a determinant of the gender gap in competitive preferences, while Section 6.2 applies the benchmark analysis only on working

mothers. Finally, in Section 6.3 the gender gap in competitive taste is tested as a potential mechanism for labor outcomes.

## **6.1 Industry**

The demand for services declined during the pandemic, and as a result, the population occupied in this sector, which is predominantly comprised of women, saw a higher decrease in their employment and working hours (Albanesi and Kim, 2021). Therefore, below, new outcomes are presented accounting for the industry in which a respondent is employed. First, industry is used to create two sub-samples to run the benchmark analysis, and then industry is introduced directly into the model.

The measure for the industry is based on the survey question, “To which of the following occupational groups do you belong?”. It is noted that the possible answers in the EVS differed from those in the WVS, and thus a matching exercise was conducted according to which 9 broad categories arose. The variable created called “Service” takes the value 1 if the respondent is employed in the services industry and 0 otherwise. It includes, among others, restaurant owners, police officers, waitresses, and caretakers. For a distribution of the occupations by gender please refer to Appendix 4.

### *6.1.1 Covid-19 effect according to subsamples by industry*

The results of the full specification ran to test the two hypotheses are shown in the tables below (see Appendix 5 for the specifications without controls and fixed effects). Both tables show no change compared to the initial findings. Hence, being occupied in the service sector is not linked to the gender gap in competition attitudes as a result of either the Omicron variant as a whole or its two separate phases. The only difference involves the size of the gender gap, which is larger for the service sector compared to all other sectors. However, caution is needed since one limitation of this approach is the very small sample of the services group.



Table 6.1.1. Impact of industry on the 4<sup>th</sup> Covid-19 wave and gender gap in competition taste relationship

Statement Dependent variable	"Competition is good"	
	Agreement with Statement	
	Service	Other
Female	-0.2464** (0.0977)	-0.0447** (0.0188)
Covid-19	0.4038 (0.5357)	0.0165 (0.0567)
Female x Covid-19	0.1773 (0.1827)	0.0271 (0.0316)
Constant	0.9811 (0.5709)	1.0501 (0.0942)
Controls	Yes	Yes
Mode fixed effects	Yes	Yes
Region fixed effects	Yes	Yes
Month fixed effects	Yes	Yes
Observations	301	2,908
R <sup>2</sup>	0.1538	0.0464

Notes: The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful". Service is a binary variable equal to 1 if the respondent is occupied in the service sector and 0 otherwise. Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 6.1.2. Impact of industry on the medium and very significant policies and gender gap in competition taste relationship

Statement Dependent variable	"Competition is good"	
	Agreement with Statement	
	Services	Other
Female	-0.2461** (0.1001)	-0.0445** (0.0186)
Medium	0.3919 (0.5373)	0.0123 (0.0567)
Very significant	0.4331 (0.5414)	0.0203 (0.0601)
Female x Medium	0.1819 (0.2066)	0.0114 (0.0460)
Female x Very significant	0.1694 (0.1792)	0.0468 (0.0297)
Constant	0.9625 (0.5906)	1.0580 (0.0900)
Controls	Yes	Yes
Mode fixed effects	Yes	Yes
Region fixed effects	Yes	Yes
Month fixed effects	Yes	Yes
Observations	301	2,908
R <sup>2</sup>	0.1543	0.0468

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement “Competition is good” and 0 if the respondents agree with the statement “Competition is harmful”. Service is a binary variable equal to 1 if the respondent is occupied in the service sector and 0 otherwise. Control variables include income, education, age, marital status, employment status, partner’s employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

### 6.1.2 Industry as a direct factor

Tables 6.1.3 and 6.1.4 display the results of the regressions when industry is directly introduced, including control variables and fixed effects (please see Appendix 6 for the specifications without controls and fixed effects). As above, being a female in the service sector during Covid-19 does not change the competitive taste. Nonetheless, the sector is associated with the gender gap; being a female in the services sector leads to a less positive taste of competition.

Table 6.1.3. Impact of industry on the 4<sup>th</sup> Covid-19 wave and gender gap in competition taste relationship

Statement	"Competition is good"
Dependent variable	Agreement with Statement
Female	-0.0508** (0.0190)
Covid-19	0.0500 (0.0563)
Female x Covid-19	0.0317 (0.0321)
Services sector	0.0205 (0.0313)
Female x Services sector	-0.0852*** (0.0188)
Female x Services sector x Covid-19	0.0538 (0.0601)
Constant	1.0437 (0.0952)
Controls	Yes
Mode fixed effects	Yes
Region fixed effects	Yes
Month fixed effects	Yes
Observations	3,209
R <sup>2</sup>	0.0469

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement “Competition is good” and 0 if the respondents agree with the statement “Competition is harmful”. Service is a binary variable equal to 1 if the respondent is occupied in the service sector and 0 otherwise. Control variables include income, education, age, marital status, employment status, partner’s employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 6.1.4. Impact of industry on the medium and very significant phases and gender gap in competition taste relationship

Statement	"Competition is good"
Dependent variable	Agreement with Statement
Female	-0.0506** (0.0189)
Medium	0.0426 (0.0539)
Very significant	0.0566 (0.0605)
Female x Medium	0.0193 (0.0441)
Female x Very significant	0.0486 (0.0307)
Services sector	0.0210 (0.0314)
Female x Services sector	-0.0857*** (0.0186)
Female x Services sector x Medium	0.0523 (0.0359)
Female x Services sector x Very significant	0.0528 (0.1061)
Constant	1.0467 (0.0952)
Controls	Yes
Mode fixed effects	Yes
Region fixed effects	Yes
Month fixed effects	Yes
Observations	3,209
R <sup>2</sup>	0.0474

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement “Competition is good” and 0 if the respondents agree with the statement “Competition is harmful”. Service is a binary variable equal to 1 if the respondent is occupied in the service sector and 0 otherwise. Control variables include income, education, age, marital status, employment status, partner’s employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

From the above, it can be inferred that being occupied in the service sector in the Netherlands is not linked to the gender gap in competition taste before and during the fourth wave of Covid-19, as a whole or divided into the very significant and medium phases. There is, however, an effect of the industry on competitiveness, as females employed in service-related jobs are about 8.5 percentage points less likely to prefer competition than males in the same industry or respondents in other industries.

## 6.2 Female subgroup with working mothers

An additional assumption upon which the present study is developed is that working mothers in particular burdened heavier labor consequences of the pandemic compared to any other demographic group. Hence, the main analysis is now conducted specifically on this group.

Regarding the demographic characteristics of the sample, 325 Dutch working mothers participated in the EVS, with a mean age of 47.58 years. Most of them (70%) are either married or living as married. Slightly less than half of the sample (49%) have 2 children. The same share of women (22%) has either 1 or 3 children and 7% has more than 4 children. 53% have received an upper education, 30% a middle one and 17% a lower education. Almost half of participants (48%) reported to be in the higher income scale, 39% in the middle and the rest 14% in the lower one. Most of the participated mothers (52%) have a part-time employment contract, while 38% work full-time and 10% are self-employed. Finally, their partners' employment status is mainly full-time (58%), with the remaining statuses having very few responses. It is also noted that this question does not apply to 21% of the participants.

The characteristics of participants in the WVS sample are very similar to those of the EVS. There are 277 observations, while the mean age is 48.90, with 88% of the females being married or living as married. 44% have two children, and around the same share have one or more than 3 children. Slightly more than half of the WVS sample consists of participants in the higher education group, while 33% and 11% belong to the high- and low-education levels, respectively. The largest share of the sample (55%) has a part-time employment contract, full-time employment is exercised by 41% of the working mothers, and the remaining 4% are self-employed respondents. 64% of their partners work full-time, with the remaining statuses having very few responses.

The only difference can be found in income levels, with the same percentage of respondents earning a higher and middle level of income (45% and 44%, respectively), whereas the WVS participants in the lower level are close to those in the EVS (10% and 14%, respectively). Please refer to Appendix 7 for the table with the summary statistics.

Moving on to the results, the tables below (Table 6.2.1 and 6.2.2) present the same, full specifications run in the benchmark analysis (refer to Appendix 8 for the specifications without controls and fixed effects). No effect of the Omicron variant on the gender gap in competition taste is observed when only the working mothers of the sample are taken into consideration. Irrespective of which phase of the Omicron period is tested, the coefficients are not statistically significant. It is mentioned that one limitation of this method is the small sample size.

Table 6.2.1. Impact of the 4<sup>th</sup> Covid-19 wave on the gender gap in competition taste

Statement	"Competition is good"
Dependent variable	Agreement with Statement
Covid-19	0.0780 (0.1798)
Constant	0.8567 (0.2232)
Controls	Yes
Mode fixed effects	Yes
Region fixed effects	Yes
Month fixed effects	Yes
Observations	602
R <sup>2</sup>	0.0798

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful". Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 6.2.2. Impact of medium and very significant phases on the gender gap in competition taste

Statement	"Competition is good"
Dependent variable	Agreement with Statement
Medium	0.0240 (0.1627)
Very significant	0.1578 (0.1942)
Constant	0.9350 (0.2116)
Controls	Yes
Mode fixed effects	Yes
Region fixed effects	Yes
Month fixed effects	Yes
Observations	602
R <sup>2</sup>	0.0889

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful". Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

### 6.3 Income consequences

The ultimate motivation of this study is that Covid-19 may have altered the gap in the competition attitudes of men and women with a subsequent effect on labor outcomes. While no influence of the pandemic on competitive preferences is found, this relationship could instead act as a mechanism for different employment results based on gender.

Focusing on income, this section investigates this relationship employing an ordered probit estimation method. Income is the dependent variable following a scale from 1 to 10, with 1 meaning that the respondent belongs to the lowest income level and 10 to the highest one. Gender, competition and Covid-19 or the two different phases are the main determinants, as specified in the main analysis (Section 3.5). Interaction terms between these variables are also included in the model so as to test for a potential heterogeneous effect on income.

Table 6.3.1 shows the regression estimates corresponding to whether the gender gap in competitiveness during the Omicron variant period influences the income of the respondents. The results indicate that no such relationship exists. More specifically, the coefficients of the variables “Female”, “Covid-19” and “Competition” are statistically significant. They suggest that both females and the pandemic negatively impacted income and that having a positive competitive taste is positively associated with income. However, none of the coefficients of the interaction terms are significant in statistical terms. For the specifications without controls and fixed effects as well as the marginal effects, please refer to Appendix 9, Tables 9.1 and 9.2.

Table 6.3.1. Impact of the 4<sup>th</sup> Covid-19 wave, gender and competition on income

Dependent variable	Income scale
Female	-0.2927*** (0.0729)
Covid-19	-0.4347*** (0.1689)
Competition	0.1675*** (0.0422)
Female x Competition	0.0213 (0.0670)
Competition x Covid-19	-0.0072 (0.0756)
Female x Covid-19	0.1730 (0.1115)
Female x Covid-19 x Competition	-0.0864 (0.1009)
Controls	Yes
Mode fixed effects	Yes
Region fixed effects	Yes
Month fixed effects	Yes
Observations	3,209
Pseudo R <sup>2</sup>	0.1356

*Notes:* The dependent variable is an ordered categorical variable equal to 1 if the respondent belongs to the lowest income scale and 10 if the respondent belongs to the highest income scale. Control variables include income, education, age, marital status, employment status, partner’s employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Regarding the effect of the medium and very significant phases of the 4<sup>th</sup> Covid-19 wave, as in Table 6.3.1, separately gender, phase and competitive preference influence the income earned. The coefficients are similar to the ones presented above in sign and significance. Interestingly, the very significant phase does have a differential effect on income for men and women; being a female during this phase increases the income earned. What is more, being a female during the very significant phase but with a positive competitive taste decreases the income received. Consequently, experiencing the very significant phase of the Omicron variant has a differential effect on income for males and females with positive and negative competitive attitudes. For the specifications without controls and fixed effects, as well as the marginal effects, please refer to Appendix 9, Tables 9.3 and 9.4.

Table 6.3.2. Impact of medium and very significant phases, gender, and competition on income

Dependent variable	Income scale
Female	-0.2924*** (0.0727)
Medium	-0.3644** (0.1772)
Very significant	-0.4951** (0.1981)
Competition	0.1673*** (0.0423)
Female x Competition	0.0215 (0.0671)
Competition x Medium	-0.1081 (0.1134)
Competition x Very significant	0.0770 (0.1284)
Female x Medium	0.0384 (0.1593)
Female x Very significant	0.3155** (0.1224)
Female x Medium x Competition	0.1570 (0.1172)
Female x Very significant x Competition	-0.3380** (0.1677)
Controls	Yes
Mode fixed effects	Yes
Region fixed effects	Yes
Month fixed effects	Yes
Observations	3,209
R <sup>2</sup>	0.1359

*Notes:* The dependent variable is an ordered categorical variable equal to 1 if the respondent belongs to the lowest income scale and 10 if the respondent belongs to the highest income scale. Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

To sum up, although Covid-19 does not seem to have impacted the competitive preferences of Dutch men and women, competition mediates the relationship between the very significant phase and income for the two genders. There is evidence that when in an extreme environment, income is affected through competitive attitudes, amplifying the existing gender gaps in labor outcomes.

## 7. Discussion

The aim of this study is to examine whether the gender gap in attitude towards competition shifted during Covid-19 for the Dutch population. For that purpose, the Joint EVS / WVS 2017-2022 dataset was employed. The focus is on the last wave of the pandemic, during which the Omicron was dominating the Netherlands. The reason behind this choice is to explore the competitive reactions of men and women after they confront the first shock so as to uncover any longer-lasting impact. To further unveil the dynamics of preference change based on the context, the influence of the stringency level in the measures implemented by the Dutch government is also investigated. All in all, the findings suggest no impact of Covid-19 on the gender gap in competition taste. Although the results regarding the very significant phase are statistically significant, they are imprecise and do not pass the robustness checks deeming the estimation method less reliable. Evaluating the assumptions on which this research was built, it follows that being employed in the services sector as well as being a mother did not change the results. However, in line with prior research (Buser et al., 2014; Buser, 2019), the preference for competition was instead a determinant of income during the pandemic.

Contrary to the original hypotheses, it can thus be inferred that the pandemic did not alter the gender in taste for competition. It is likely that Covid-19 did not entail the same labor and attitude repercussions for Dutch women as in other nations as presented in Section 2. The distinct Dutch context, with the advanced remote work means and the high share of part-time employment, may have created a different landscape that affects preferences in a different way than the one documented in Section 2. Even though there are suggestions that Dutch women shouldered the majority of unpaid work during the pandemic (Alon et al., 2021), the working culture of remote and part-time work is likely to have prevented the amplification of the gender disparities in competitive tastes. Another parameter that might have contributed to the opposite results is the extremely limited percentage of people that adhere to conservative gender role attitudes<sup>1</sup> along with the high score in the European gender equality index.

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<sup>1</sup>Approximately 3% of the total sample agrees with statements included in the dataset that reveal traditional views on gender role attitudes.



Looking at the second World War, this economic shock triggered an increase in the female labor supply which changed preferences (Fernández et al., 2004). The change was less dependent on whether women were employed during that time and more on the expectations shaped about the future labor (Fernández et al., 2004). That is, for the first case, although the effect was direct, it did not last, while for the latter, the impact was indirect and long-lasting (Fernández et al., 2004). This pattern had far-reaching consequences on attitudes for the cohort that was too young to be directly affected, but that was at the right age to be influenced a few years later (Fernández et al., 2004). Similarly, the pandemic may not have altered the competitive attitudes for the respondents that were immediately affected, but the effects may materialize later. Thus, research in the future is suggested to explore the competitive tastes of men and women that were too young to be directly impacted by the pandemic to discover any longer-term shifts in the gender gap.

Alternatively, belief updating, or more precisely, the lack of it, could have also acted as a mechanism that left attitudes unchanged. Belief updating is the process by which individuals revise their beliefs based on newly available information (Bennett, 2015). When rational agents encounter new evidence that contradicts their existing beliefs, they should adjust their attitudes accordingly (Ambuehl and Li, 2018). However, humans cannot be characterized as fully rational and thus, this process turns out to be ineffective in many situations (Kahneman, 2011; Ambuehl and Li, 2018). The pandemic may well be one such case. Covid-19 can be characterized as an abrupt event and research indicates that it is difficult for people to form beliefs following such a shock (Fetzel et al., 2020; Gallagher, 2014; Rabin, 2002), since they cannot consult prior information to assess the likelihood and then form decisions (Tversky and Kahneman, 1973). Thus, people are likely to shape their beliefs following a different mechanism compared to previous, more standard, economic crises. As long as attitudes are a reflection of beliefs (Alwin et al., 1983), it is likely that preference formation or change could manifest itself in a different way.

At the same time, the findings should be viewed in light of several limitations. With respect to the research design, although, overall, the findings pass the robustness checks, when the dependent variable “Competition” is introduced in the model in a scale form rather than as a binary variable, the estimates of the interaction between the very significant and the gender of the respondent lead to different results. This suggests that individual competitive preferences may have followed a different process during Covid-19 compared to the gender gap in those preferences. On top of that, the sample size of the two subphases of the Omicron variant is relatively small which threatens the reliability of the results, especially regarding the interaction terms. As mentioned in Section 3.3, the Dutch government implemented different measures for the vaccinated and unvaccinated populations. This asymmetry could entail important implications for the analysis, as the attitudes of individuals that did not receive the Covid-19

vaccine, and were faced with stricter policies, could have been impacted differently than those that received the vaccine. Future research could shed light on whether and how preferences changed for the two populations by incorporating information on vaccination status. Another drawback related to the dataset is that the two surveys that were combined to create the Joint EVS / WVS 2017-2022 dataset were not identical in the answers they offered to the respondents, and as a result, relevant information was lost due to matching exercises.

Most of the literature related to Section 2 focused on the U.S., where most of the Covid-19 evidence and consequences have been observed. It is possible, then, that the same rationale does not apply to the Dutch case. Documenting the labor effects of the pandemic in the Netherlands could, hence, be the topic for future research. A more precise theoretical framework could add to the analysis and the formation of highly relevant hypotheses to better examine the gender gap in competitive attitudes in one of the most advanced countries in the world. The analysis falls somewhat sort of external validity in that the Dutch context is very unique and the results are very difficult to replicate in other countries. However, there is a trade off since focusing on one culture promises a limited influence of unobservable factors. Last but not least, it is extremely difficult to formally study and examine preference or attitude change in general. There are a plethora of internal mechanisms at play that are very complicated to observe and measure (Loewenstein and Anger, 2003). After accumulating more knowledge on the topic of how preferences are shaped and subsequently change, the present research could be replicated to unveil a more accurate understanding of the mechanisms of taste for competition in the event of an unprecedented economic shock like the Covid-19 pandemic.

## 8. Conclusion

This research aimed at answering one critical question: “What was the impact of Covid-19 on the gender gap in attitudes towards competition?”. Two hypotheses were formulated to explore this issue expecting, first, that the gap increased during the pandemic relative to the pre-pandemic phase, and second, that the effect was wider during strict versus medium containment measures.

The results show that the pandemic did not produce a shift in the Dutch gender gap in competition attitudes, nor did the very significant or medium phases. Since the major motivation of the study was to ultimately discover any repercussions of Covid-19 on labor market outcomes, the three main assumptions on which the hypotheses were based were also assessed. According to the findings, the service sector, which employs many women and was vastly affected by the pandemic did not seem to alter the results; the gender gap in competition taste remained intact. The same holds true when working mothers are taken into account. While the gap that exists in the taste for competition between men and women in the Netherlands has

neither widened nor narrowed during the fourth Covid-19 wave, the competitive preferences as manifested during the very significant phase contributed to women earning less than men.

In understanding the opposite outcomes, two main explanations have been employed. First, it is very likely that the discrepancies stem from the unique Dutch context. The Netherlands had already developed a working-from-home culture, while, at the same time, being a country with very advanced gender role attitudes. Taken together, these aspects may have created a more stable and certain environment, especially for women, which did not affect the competitive preferences. Second, the process of preference change as a result of an economic shock likely follows a different process. It is suggested that it materialize either instantly or during later generations. As such, the competition gap cannot have been shifted during the period under study. Belief updating could also interfere with the process and produce contradictory results.

Despite its limitations, the present study can still be considered a valuable contribution to the existing literature on attitude change in the wake of an exogenous economic shock. The gender gap in attitudes towards competition has the potential to have far reaching implications in the workplace and education, leading to unequal pay and opportunities for women. Therefore, it is imperative to understand the power dynamics at play and the role of competition in our society. Even though the results do not point to a significant impact of the pandemic on competitive preferences, they do offer valuable insights about the topic of attitude change. Understanding when and how preferences change is crucial for policymakers and economists in order to accurately respond and implement targeted policies and interventions.

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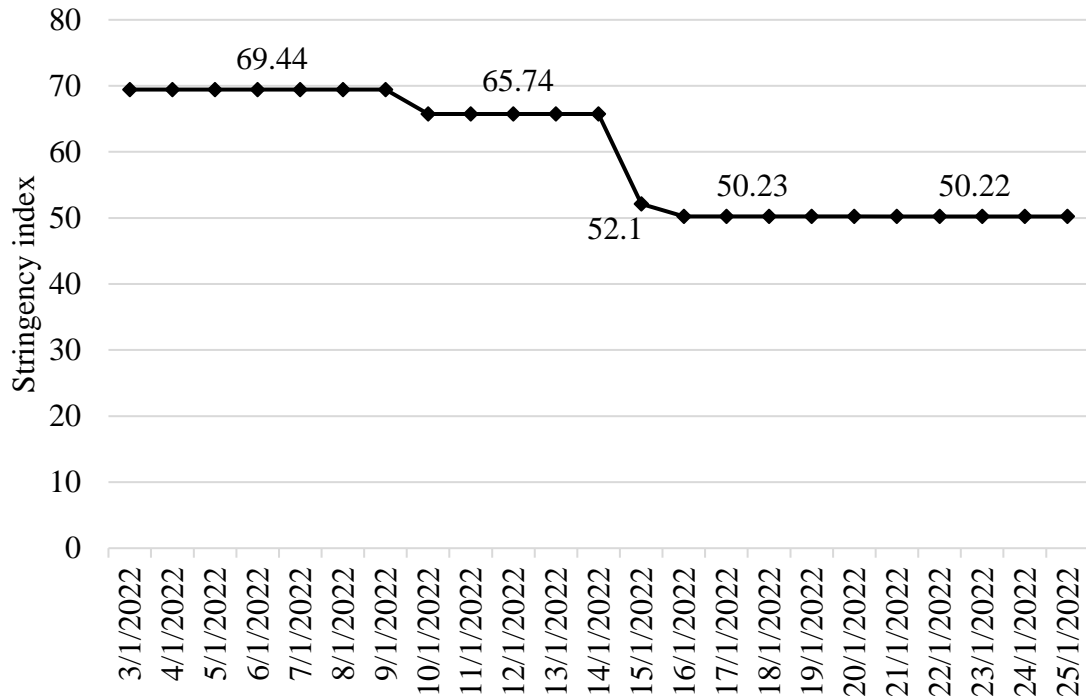


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# Appendix

## Appendix 1: Stringency index

Figure 1. Stringency index for the period 3-25 of January 2022, Netherlands



Adapted source: Hale et al., 2021

## Appendix 2: Robustness – Logit estimation

Table 2.1. Impact of the 4<sup>th</sup> Covid-19 wave on the gender gap in competition taste - Average marginal effects based on outcome 10

Statement	"Competition is good"				
Dependent variable	Agreement with Statement				
	(1)	(2)	(3)	(4)	(5)
Female	-0.0461*** (0.0112)	-0.0445*** (0.0078)	-0.0444*** (0.0076)	-0.0440*** (0.0079)	-0.0443*** (0.0073)
Covid-19	0.1120*** (0.0151)	0.1093*** (0.0213)	0.1105*** (0.0237)	0.1083*** (0.0233)	0.0604 (0.0619)

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement “Competition is good” and 0 if the respondents agree with the statement “Competition is harmful”. Marginal effects are calculated by the means of the independent variables. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 2.2. Impact of the medium and very significant phases on the gender gap in competition taste - Average marginal effects based on outcome 10

Statement	"Competition is good"				
Dependent variable	Agreement with Statement				
	(1)	(2)	(3)	(4)	(5)
Female	-0.0453*** (0.0110)	-0.0434*** (0.0075)	-0.0433*** (0.0073)	-0.0430*** (0.0076)	-0.0432*** (0.0070)
Medium	0.0949*** (0.0092)	0.0911*** (0.0141)	0.0923*** (0.0167)	0.0894*** (0.0160)	0.0443 (0.0549)
Very significant	0.1192*** (0.0214)	0.1179*** (0.0266)	0.1190*** (0.0282)	0.1177*** (0.0282)	0.0747 (0.0642)

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement “Competition is good” and 0 if the respondents agree with the statement “Competition is harmful”. Marginal effects are calculated at the means of the independent variables. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

### Appendix 3: Robustness – Ordered probit estimation

Table 3.1. Impact of the 4<sup>th</sup> Covid-19 wave on the gender gap in competition taste - Average marginal effects based on outcome 10

Statement	"Competition is good"				
Dependent variable	Agreement with Statement				
	(1)	(2)	(3)	(4)	(5)
Female	-0.0209*** (0.0015)	-0.0220*** (0.0021)	-0.0221*** (0.0021)	-0.0221*** (0.0021)	-0.0222*** (0.0022)
Covid-19	0.0152*** (0.0036)	0.0147*** (0.0041)	0.0134*** (0.0043)	0.0129*** (0.0042)	-0.0023 (0.0133)

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement “Competition is good” and 0 if the respondents agree with the statement “Competition is harmful”. Marginal effects are calculated at the means of the independent variables. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 3.2. Impact of the medium and very significant phases on the gender gap in competition taste - Average marginal effects based on outcome 10

Statement	"Competition is good"				
Dependent variable	Agreement with Statement				
	(1)	(2)	(3)	(4)	(5)
Female	-0.0208*** (0.0015)	-0.0218*** (0.0022)	-0.0219*** (0.0021)	-0.0219*** (0.0022)	-0.0220*** (0.0022)
Medium	0.0116*** (0.0034)	0.0108*** (0.0040)	0.0094** (0.0038)	0.0085** (0.0036)	-0.0065 (0.0115)
Very significant	0.0200*** (0.0057)	0.0197*** (0.0061)	0.0182*** (0.0065)	0.0179*** (0.0064)	0.0016 (0.0145)

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement “Competition is good” and 0 if the respondents agree with the statement “Competition is harmful”. Marginal effects are calculated at the means of the independent variables. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## Appendix 4: Distribution of occupations

Table 4.1. Respondents' occupation distribution

Occupation	Male	Female	Total
Professional and technical	54.77%	47.60%	51.14%
Clerical	10.68%	18.88%	14.83%
Services	6.57%	12.12%	9.38%
Sales	4.80%	7.75%	6.29%
Skilled workers	9.98%	1.41%	5.64%
Semi-skilled workers	5.56%	1.29%	3.40%
Unskilled workers	1.77%	4.12%	2.96%
Skilled farm workers	0.95%	0.31%	0.62%
Armed forces	0.38%	0.00%	0.19%
Never had a job	0.13%	0.55%	0.34%
Do not know	1.07%	1.35%	1.22%
No answer	1.90%	1.23%	1.56%
Not applicable	1.45%	3.38%	2.43%

*Notes:* Table 4.1 reports the percentage of respondents in each occupation category, by gender and for the total sample.

## Appendix 5: Covid-19 effect according to subsamples by industry

Table 5.1. Impact of industry on the 4<sup>th</sup> Covid-19 wave and gender gap in competition taste relationship

Statement	"Competition is good"			
Dependent variable	Agreement with Statement			
<i>Panel A: Service sector</i>				
	(1)	(2)	(3)	(4)
Female	-0.2037**	-0.2268**	-0.2223**	-0.2159**
	-0.0915	-0.09	-0.0848	-0.0902
Covid-19	-0.0174	0.0251	0.0557	0.0601
	-0.1394	-0.1382	-0.1407	-0.1506
Female x Covid-19	0.2116	0.1535	0.1503	0.1498
	-0.1771	-0.1666	-0.1646	-0.176
Constant	0.7317	0.9952	1.0327	1.2393
	-0.0715	-0.1203	-0.1009	-0.2772
Controls	No	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes
Region fixed effects	No	No	No	Yes
Month fixed effects	No	No	No	No
Observations	301	301	301	301
R <sup>2</sup>	0.0397	0.1241	0.1269	0.1464
<i>Panel B: Other sectors</i>				
	(1)	(2)	(3)	(4)
Female	-0.0507**	-0.0446**	-0.0446**	-0.0433**
	-0.0203	-0.0188	-0.0186	-0.0192
Covid-19	0.0961***	0.0919***	0.0926***	0.0919***
	-0.0173	-0.0181	-0.0194	-0.0193
Female x Covid-19	0.0296	0.0284	0.0284	0.0259
	-0.0309	-0.0316	-0.0315	-0.0318
Constant	0.6712	0.6667	0.6676	0.931
	-0.0097	-0.067	-0.0675	-0.0605
Controls	No	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes
Region fixed effects	No	No	No	Yes
Month fixed effects	No	No	No	No
Observations	2,908	2,908	2,908	2,908
R <sup>2</sup>	0.0159	0.041	0.041	0.0436

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful". Service is a binary variable equal to 1 if the respondent is occupied in the service sector and 0 otherwise. Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 5.2. Impact of industry on the medium and very significant phases and gender gap in competition taste relationship

Statement	"Competition is good"			
Dependent variable	Agreement with Statement			
<i>Panel A: Service sector</i>				
	(1)	(2)	(3)	(4)
Female	-0.0537**	-0.2268**	-0.2223**	-0.2155**
	-0.0918	-0.0909	-0.0856	-0.0918
Medium	-0.0442	0.0027	0.0346	0.0429
	-0.1665	-0.1527	-0.156	-0.1663
Very significant	0.0102	0.0513	0.0792	0.0801
	-0.1225	-0.1338	-0.1354	-0.1465
Female x Medium	0.2107	0.1604	0.1563	0.1547
	-0.1994	-0.1798	-0.1771	-0.1985
Female x Very significant	0.2118	0.144	0.1419	0.1415
	-0.17	-0.1702	-0.169	-0.1759
Constant	0.7317	0.9967	1.0333	1.2293
	-0.0718	-0.1194	-0.0995	-0.2809
Controls	No	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes
Region fixed effects	No	No	No	Yes
Month fixed effects	No	No	No	No
Observations	301	301	301	301
R <sup>2</sup>	0.0411	0.1249	0.1275	0.1468
<i>Panel B: Other sectors</i>				
	(1)	(2)	(3)	(4)
Female	-0.0507**	-0.0445**	-0.0445**	-0.0431**
	-0.0204	-0.0186	-0.0183	-0.019
Medium	0.0943***	0.0890***	0.0897***	0.0873***
	-0.0224	-0.0185	-0.0183	-0.0182
Very significant	0.0975***	0.0940***	0.0946***	0.0952***
	-0.0245	-0.026	-0.0277	-0.0279
Female x Medium	0.0139	0.0113	0.0113	0.0101
	-0.0483	-0.0458	-0.0456	-0.0461
Female x Very significant	0.0484*	0.0493	0.0493	0.0455
	-0.0271	-0.0303	-0.0302	-0.0299
Constant	0.6712	0.6656	0.6665	0.9393
	-0.0098	-0.0675	-0.0681	-0.0564
Controls	No	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes
Region fixed effects	No	No	No	Yes
Month fixed effects	No	No	No	No
Observations	2,908	2,908	2,908	2,908
R <sup>2</sup>	0.0162	0.0414	0.0414	0.0441

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful". Service is a binary variable equal to 1 if the respondent is occupied in the service sector and 0 otherwise. Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## Appendix 6: Industry as a direct factor

Table 6.1. Impact of industry on the 4<sup>th</sup> Covid-19 wave and gender gap in competition taste relationship

Statement	"Competition is good"			
Dependent variable	Agreement with Statement			
	(1)	(2)	(3)	(4)
Female	-0.0537** (0.0208)	-0.0522** (0.0192)	-0.0521** (0.0189)	-0.0500** (0.0198)
Covid-19	0.0887*** (0.0192)	0.0863*** (0.0200)	0.0879*** (0.0202)	0.0880*** (0.0200)
Female x Covid-19	0.0370 (0.0333)	0.0346 (0.0325)	0.0346 (0.0324)	0.0312 (0.0328)
Services sector	-0.0069 (0.0345)	0.0195 (0.0319)	0.0194 (0.0318)	0.0197 (0.0313)
Female x Services sector	-0.0857*** (0.0196)	-0.0886*** (0.0195)	-0.0885*** (0.0194)	-0.0864*** (0.0188)
Female x Services sector x Covid-19	0.0686 (0.0546)	0.0631 (0.0577)	0.0631 (0.0576)	0.0565 (0.0588)
Constant	0.6743 (0.0098)	0.6921 (0.0639)	0.6942 (0.0647)	0.9547 (0.0621)
Controls	No	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes
Region fixed effects	No	No	No	Yes
Month fixed effects	No	No	No	No
Observations	3,209	3,209	3,209	3,209
R <sup>2</sup>	0.0188	0.0415	0.0416	0.0443

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful". Service is a binary variable equal to 1 if the respondent is occupied in the service sector and 0 otherwise. Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



Table 6.2. Impact of industry on the medium and very significant phases and gender gap in competition taste relationship

Statement Dependent variable	"Competition is good"			
	Agreement with Statement			
	(1)	(2)	(3)	(4)
Female	-0.0537** (0.0208)	-0.0520** (0.0191)	-0.0519** (0.0188)	-0.0498** (0.0197)
Medium	0.0838*** (0.0208)	0.0804*** (0.0166)	0.0820*** (0.0158)	0.0802*** (0.0154)
Very significant	0.0928*** (0.0245)	0.0909*** (0.0270)	0.0925*** (0.0276)	0.0940*** (0.0279)
Female x Medium	0.0244 (0.0488)	0.0205 (0.0445)	0.0204 (0.0443)	0.0186 (0.0448)
Female x Very significant	0.0531* (0.0287)	0.0528 (0.0312)	0.0528 (0.0311)	0.0481 (0.0312)
Services sector	-0.0065 (0.0348)	0.0199 (0.0320)	0.0199 (0.0319)	0.0203 (0.0313)
Female x Services sector	-0.0860*** (0.0195)	-0.0890*** (0.0193)	-0.0889*** (0.0193)	-0.0869*** (0.0186)
Female x Services sector x Medium	0.0583 (0.0412)	0.0576 (0.0349)	0.0576 (0.0348)	0.0553 (0.0348)
Female x Services sector x Very significant	0.0761 (0.1001)	0.0660 (0.1038)	0.0660 (0.1038)	0.0550 (0.1051)
Constant	0.6743 (0.0098)	0.6912 (0.0642)	0.6932 (0.0650)	0.9582 (0.0595)
Controls	No	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes
Region fixed effects	No	No	No	Yes
Month fixed effects	No	No	No	No
Observations	3,209	3,209	3,209	3,209
R <sup>2</sup>	0.0192	0.0420	0.0420	0.0447

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful". Service is a binary variable equal to 1 if the respondent is occupied in the service sector and 0 otherwise. Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## Appendix 7: Demographic characteristics of working mothers

Table 7.1. Demographic characteristics of working mothers, EVS and WVS survey respondents

<i>Study</i>	<b>EVS</b>				<b>WVS</b>			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Age	47.58	10.260	20	80	48.90	10.496	20	76
<i>Marital status</i>								
Married/Living together	0.70	0.460	0	1	0.88	0.329	0	1
Divorced/Separated	0.15	0.361	0	1	n/a	n/a	n/a	n/a
Widowed	0.03	0.173	0	1	n/a	n/a	n/a	n/a
Single/never married	0.12	0.322	0	1	0.12	0.329	0	1
<i>Children</i>								
1 child	0.22	0.416	0	1	0.28	0.451	0	1
2 children	0.49	0.501	0	1	0.44	0.498	0	1
3 children	0.22	0.418	0	1	0.20	0.402	0	1
4 children	0.05	0.217	0	1	0.04	0.204	0	1
more than 5 children	0.02	0.135	0	1	0.03	0.168	0	1
<i>Education</i>								
Lower	0.17	0.376	0	1	0.11	0.316	0	1
Middle	0.30	0.460	0	1	0.33	0.472	0	1
Upper	0.53	0.500	0	1	0.56	0.498	0	1
<i>Income scale</i>								
Low	0.14	0.343	0	1	0.10	0.307	0	1
Middle	0.39	0.488	0	1	0.45	0.499	0	1
High	0.48	0.500	0	1	0.44	0.498	0	1
<i>Employment</i>								
Full time	0.38	0.487	0	1	0.41	0.493	0	1
Part time	0.52	0.500	0	1	0.55	0.499	0	1
Self employed	0.10	0.298	0	1	0.04	0.204	0	1
<i>Partner's employment</i>								
Full time	0.58	0.495	0	1	0.64	0.482	0	1
Part time	0.04	0.196	0	1	0.05	0.219	0	1
Self employed	0.07	0.262	0	1	0.05	0.212	0	1
Retired/pensioned	0.06	0.235	0	1	0.08	0.271	0	1
Housewife	0.01	0.078	0	1	0.01	0.104	0	1
Unemployed	0.02	0.145	0	1	0.02	0.146	0	1
Other	0.02	0.123	0	1	0.03	0.178	0	1
Not applicable	0.21	0.405	0	1	0.12	0.329	0	1
Observations	325				277			

Notes: Table 7.1 shows the demographic statistics of the respondents who are females with children and are employed full time, part time or are self-employed, by survey. The variable name, mean, standard deviation, minimum and maximum are shown respectively.

## Appendix 8: Female subgroup with working mothers

Table 8.1. Impact of the 4<sup>th</sup> Covid-19 wave on the gender gap in competition taste

Statement	"Competition is good"			
Dependent variable	Agreement with Statement			
	(1)	(2)	(3)	(4)
Covid-19	0.1223*** (0.0241)	0.1266*** (0.0322)	0.1280*** (0.0317)	0.1357*** (0.0325)
Constant	0.6431 (0.0177)	0.5560 (0.1463)	0.5583 (0.1432)	0.7532 (0.1806)
Controls	No	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes
Region fixed effects	No	No	No	Yes
Month fixed effects	No	No	No	No
Observations	602	602	602	602
R <sup>2</sup>	0.0177	0.0510	0.0510	0.0759

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful". Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 8.2. Impact of medium and very significant phases on the gender gap in competition taste

Statement	"Competition is good"			
Dependent variable	Agreement with Statement			
	(1)	(2)	(3)	(4)
Medium	0.0712** (0.0248)	0.0721** (0.0319)	0.0730** (0.0272)	0.0784** (0.0272)
Very significant	0.1931*** (0.0391)	0.2014*** (0.0479)	0.2023*** (0.0491)	0.2120*** (0.0487)
Constant	0.6431 (0.0177)	0.5628 (0.1478)	0.5645 (0.1421)	0.8336 (0.1801)
Controls	No	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes
Region fixed effects	No	No	No	Yes
Month fixed effects	No	No	No	No
Observations	602	602	602	602
R <sup>2</sup>	0.0256	0.0596	0.0596	0.0850

*Notes:* The dependent variable is a binary variable equal to 1 if the respondents agree with the statement "Competition is good" and 0 if the respondents agree with the statement "Competition is harmful". Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## Appendix 9: Income consequences

Table 9.1. Impact of the 4<sup>th</sup> Covid-19 wave, gender and competition on income

Dependent variable	Income scale			
	(1)	(2)	(3)	(4)
Female	-0.3322*** (0.0676)	-0.2929*** (0.0710)	-0.2891*** (0.0725)	-0.2890*** (0.0724)
Covid-19	0.1159 (0.0757)	-0.2066*** (0.0508)	-0.1795*** (0.0462)	-0.1775*** (0.0449)
Competition	0.2372*** (0.0409)	0.1692*** (0.0456)	0.1702*** (0.0462)	0.1700*** (0.0447)
Female x Competition	0.0783 (0.0736)	0.0205 (0.0672)	0.0178 (0.0686)	0.0262 (0.0669)
Competition x Covid-19	-0.0024 (0.0815)	-0.0104 (0.0832)	-0.0109 (0.0824)	-0.0104 (0.0774)
Female x Covid-19	0.2012 (0.1458)	0.1742 (0.1156)	0.1722 (0.1148)	0.1694 (0.1119)
Female x Covid-19 x Competition	-0.2135 (0.1315)	-0.0969 (0.1017)	-0.0946 (0.1012)	-0.0912 (0.1012)
Controls	No	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes
Region fixed effects	No	No	No	Yes
Month fixed effects	No	No	No	No
Observations	3,209	3,209	3,209	3,209
Pseudo R <sup>2</sup>	0.0081	0.1327	0.1328	0.1352

*Notes:* The dependent variable is an ordered categorical variable equal to 1 if the respondent belongs to the lowest income scale and 10 if the respondent belongs to the highest income scale. Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 9.2. Average marginal effects based on outcome 10

Dependent variable	Income scale
Female	-0.0366*** (0.0082)
Covid-19	-0.0624** (0.0268)
Competition	0.0245*** (0.0060)
Controls	Yes
Mode fixed effects	Yes
Region fixed effects	Yes
Month fixed effects	Yes
Observations	3,209

*Notes:* The dependent variable is an ordered categorical variable equal to 1 if the respondent belongs to the lowest income scale and 10 if the respondent belongs to the highest income scale. Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Marginal effects are calculated at the means of the independent variables. Standard errors

clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 9.3. Impact of the medium and very significant phases, gender, and competition on income

Dependent variable	Income scale			
	(1)	(2)	(3)	(4)
Female	-0.3324*** (0.0677)	-0.2925*** (0.0707)	-0.2888*** (0.07212)	-0.2887*** (0.0721)
Medium	0.1655 (0.1478)	-0.1422 (0.1031)	-0.1155 (0.0968)	-0.1070 (0.0994)
Very significant	0.0735 (0.0861)	-0.2606*** (0.0877)	-0.2336*** (0.0894)	-0.2364** (0.0934)
Competition	0.2373*** (0.0409)	0.1691*** (0.0456)	0.1700*** (0.0463)	0.1698*** (0.0448)
Female x Competition	0.0783 (0.0736)	0.0207 (0.0673)	0.0180 (0.0687)	0.0264 (0.0670)
Competition x Medium	-0.0885 (0.1692)	-0.1138 (0.1178)	-0.1133 (0.1174)	-0.1106 (0.1142)
Competition x Very significant	0.0701 (0.0915)	0.0762 (0.1304)	0.0749 (0.1300)	0.0732 (0.1299)
Female x Medium	0.1996 (0.2183)	0.0444 (0.1657)	0.0427 (0.1647)	0.0358 (0.1602)
Female x Very significant	0.1802 (0.1585)	0.3145*** (0.1178)	0.3122*** (0.1177)	0.3110** (0.1218)
Female x Medium x Competition	-0.0987 (0.2308)	0.1454 (0.1248)	0.1464 (0.1241)	0.1513 (0.1164)
Female x Very significant x Competition	-0.3053 (0.1896)	-0.3483** (0.1613)	-0.3449** (0.1617)	-0.3418** (0.1688)
Controls	No	Yes	Yes	Yes
Mode fixed effects	No	No	Yes	Yes
Region fixed effects	No	No	No	Yes
Month fixed effects	No	No	No	No
Observations	3,209	3,209	3,209	3,209
R <sup>2</sup>	0.0084	0.1330	0.1331	0.1355

Notes: The dependent variable is an ordered categorical variable equal to 1 if the respondent belongs to the lowest income scale and 10 if the respondent belongs to the highest income scale. Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 9.4. Average marginal effects based on outcome 10

Dependent variable	Income scale
Female	-0.0368*** (0.0082)
Medium	-0.0556** (0.0235)
Very significant	-0.0603*** (0.0223)
Competition	0.0246*** (0.0059)
Controls	Yes
Mode fixed effects	Yes
Region fixed effects	Yes
Month fixed effects	Yes
Observations	3,209

*Notes:* The dependent variable is an ordered categorical variable equal to 1 if the respondent belongs to the lowest income scale and 10 if the respondent belongs to the highest income scale. Control variables include income, education, age, marital status, employment status, partner's employment status, and children. Marginal effects are calculated by at the means of the independent variables. Standard errors clustered at the region level are presented in parentheses below the coefficient estimates. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.