

Doing it All: Self-Employed Women and Unpaid Domestic Labour during COVID-19

Keywords: Childcare, housework, self-employment, women, gender, COVID-19, pandemic

Abstract

This study addresses the profound issue of how gender inequalities in unpaid domestic work have been affected by the unique conditions of the COVID-19 pandemic and how they are associated with inequalities in the paid work of self-employed women. We use data from seven waves of the UK Understanding Society COVID-19 study (April 2020 – January 2021), together with data from before the pandemic to undertake a quantitative longitudinal analysis of the additional unpaid domestic work undertaken over an extended period during the pandemic. We find that self-employed women spent more time on both childcare and housework than employee women and men, whatever their employment. We also find that increased hours of childcare and housework by self-employed women are associated with a reduction in paid working hours, rather than the industry segregation suggested by studies earlier in the pandemic. This supports the link between the unequal division of domestic of labour and poorer paid work outcomes. We also propose a novel index of the division of domestic labour within households that measures primary responsibility for household tasks. This suggests that self-employed women have primary responsibility than all other groups. We propose that this is associated with greater mental labour, and that self-employed women will be carrying this greater mental burden as well as the additional hours they spend on unpaid domestic work.

Introduction

Prior literature has shown that despite their increased participation in paid employment, women in cohabiting couples still undertake the majority of housework and caring in the home (e.g. Bianchi and Milkie, 2010, Lachance-Grzela and Bouchard, 2010). Recent longitudinal data show that while the gender gap in housework is narrowing, for example on average women in the USA continue to undertake 1.6 times the amount of housework of men (Bianchi et al., 2012) and are more likely to reduce their paid work to undertake caring (Drew and Humbert, 2012, McGowan et al., 2012, Bari et al., 2021). To date, most studies focus on women who are employees. The few studies that have related unpaid work with entrepreneurship such as the analysis of the Australian time use study by Craig et al. (2012), show that self-employment is associated with unique time use patterns of paid work and domestic/unpaid work among women that warrants further exploration.

Understanding the division of labour within households is important. It is not simply sense of fairness, or to help address intra-family resentment, though these are important since they may result in intra-family conflict, break-up and the negative life consequences for those in the family (Bianchi and Milkie, 2010). Unequal division of labour reflects the distribution of power within households (Davis and Greenstein, 2013, Kabeer et al., 2021) and this is likely to impact other spheres of life for those involved, such as access to employment, networks, leisure and development opportunities and associated reductions in well-being (Seck et al., 2021). Studying the division of unpaid work in the home is also ‘key to understanding

gender inequality in paid work outcomes, where women, particularly mothers continue to suffer a 'wage penalty' or blocked mobility' (Bianchi and Milkie, 2010,p.708). These multiple penalties of the unequal division of unpaid work in the home can also be seen in the self-employment of women, with women more likely to work part-time, less likely to attract external funding and more likely to operate smaller businesses than their male equivalents (Marlow et al., 2009, Rouse et al., 2013, Ahl and Marlow, 2012, Foss et al., 2019).

The pandemic brought to the fore the importance of the domestic sphere and the work required to maintain it. Extended work-from-home orders have meant that, for many couples, both partners were required to spend long periods in the home, suggesting they would be able to share housework and caring. Similarly, the closing of schools, nurseries and the inability to draw on informal childcare such as grandparents, and the inability to buy in housework services such as cleaners, meant that there was more unpaid work to be done. Studies of the impact of the pandemic on employees in the UK (Hupkau and Peteongolo, 2020) and Australia found that while men increased their childcare time, women '*shouldered most of the extra unpaid work*', such that '*the relative [gender] gap in housework remained*' (Craig and Churchill, 2020, p.1).

We address the gap in knowledge about the division of unpaid work in the home amongst the self-employed in the UK. We do this against the background of the disproportionate impact of the COVID-19 pandemic on self-employed women's work found in many countries (Martinez Dy and Jayawarna, 2020). Reflecting the scale of the loss of earnings and working hours of self-employed women, Graeber et al., (2020) described Covid-19 as a crisis of the female self-employed (in Germany). The loss of businesses and exit from self-employment was also found to be higher among women than men in the USA and Canada in the early stages of the crisis (Fairlie, 2020; Beland and Mikola, 2020). We advance existing studies that have revealed the unequal impact of Covid-19 on self-employed women by providing a more complete understanding of how they were impacted by the pandemic. In particular, we explore the additional unpaid domestic work that they undertook and how this is associated with reduced paid earnings. Our work therefore addresses calls that to understand women's self-employment, it is necessary to study it in its fuller domestic setting (Bianchi and Milkie, 2010).

Our study addresses the profound issue of how gender inequalities in unpaid domestic work may have been challenged by the unique conditions created by the pandemic and how those inequalities in domestic work are associated with inequalities in paid work. We operationalise our study by means of the following research questions:

- Did self-employed women with dependent children in the UK undertake more childcare, unpaid domestic labour and experience more uneven division of domestic labour than employee women and men (both self-employed and employees) during the pandemic?
- Is an increase in these activities by self-employed women associated with a reduction in paid working hours?

The study draws on a large scale, longitudinal dataset in the UK, the UK Household Longitudinal Study also called the Understanding Society. It makes a number of contributions. To date consideration of domestic labour during the pandemic failed to undertake separate analysis of the self-employed, instead combining them with those that are employed. Previous studies of self-employment have suggested that this is flexible than employment and hence it different responses to increased domestic labour may be expected

amongst the self-employed (Wynarczyk, 2005, Hilbrecht and Lero, 2014, Peters et al., 2020). We therefore present the first analysis of domestic labour undertaken by the self-employed. We also propose a novel index of the division of domestic labour within households that measures primary responsibility for household tasks, rather than the more common measure of hours spent on housework. Our new index highlights that self-employed women take more primary responsibility than employee women or men of whatever employment type. We propose that primary responsibility is associated with greater mental labour, and that self-employed women will be carrying this greater mental burden. Finally, we challenge studies that have attributed the negative effects of the pandemic on self-employed women's paid work on industry segregation, by showing that reduced hours of working are associated with increased hours of childcare and housework rather than industry segregation.

The paper is structured as follows: the Literature Review considers theories of the division of unpaid domestic work and prior studies of childcare, housework and self-employment, including those that consider effects of the COVID-19 pandemic. The Methodology section presents the data used in the study and statistical analyses undertaken. We then present the findings of the study followed by a discussion. The conclusions summarise the study, identify limitations and make suggestions for future research.

Literature Review

Theoretical perspectives on the division of unpaid domestic work

There are three commonly cited theories on the division of unpaid work in the home. The first assumes that time is zero-sum and hence, if women spend less time than their partner in paid work, they will have more time for unpaid work. This is supported by the empirically based notion of 'iso-work', where the total of paid and unpaid work is approximately equal for men and women, and is found to be consistent across many developed countries and over decades (Sullivan et al., 2018). However, this theory lacks any notion of causality: does doing more unpaid work result in less paid work or does less paid work result in more unpaid work? Its assumption of zero-sum may also be questionable. Personal or leisure time is unaccounted for and this may be used for unpaid work if it can be seen as attractive, such as undertaking shared activities with children or others being cared for. More nuanced ideas of time use, such as multi-tasking (the combination of primary and secondary activities at the same time such as cooking and looking after children) are also over-looked. Fitting household duties into paid working time has been particularly linked to working from home (Geist and Ruppanner, 2018, Craig and Churchill, 2020). However, many office-based workers organise household activities from their workplace, something that is explicitly supported by some employers with the provision of concierge services.

A similarly pragmatic theory is based upon the resources that partners bring to the household, and how these can be used to bargain excusal from unpaid work. The most commonly considered resource is that of earnings, and classical notions of maximising economic utility suggests that the partner who earns less should undertake more of the unpaid work in the home. A key challenge to this theory is that women who earn more than their partners are found to do more housework than equal-earning women (Geist and Ruppanner, 2018). These authors propose an extension to the resources theory that recognises '*intimacy, emotions (protecting one's own or that of the partner), and relationship history (e.g. knowledge of the other partner and previous conflicts)*' (p.245).

The third theoretical perspective posits that women doing more unpaid work in the home is a gendered effect. This may be either as a result of gendered societal conditions (e.g. lower pay rates for traditional women's roles) or women wishing to fulfil gendered expectations or roles, such as being seen to care for their families. The gendered perspective is drawn on to explain the persistent higher level of unpaid work in the home over many years, despite the increase in women's participation in the workforce (Bianchi et al., 2012). However, it suggests that individual women and couples have little agency in the face of tacit and unquestioned societal structures and expectations, and that they are reinforcing their own arenas of subjugation.

Others suggest that the three theories are present in combination and are self-reinforcing. For example, women are likely to accumulate less resources (resource view) as society devalues work associated with women (gendered view) (Davis and Greenstein, 2013). These authors also argue that consideration of power is also a means of melding the three perspectives.

Unpaid domestic work, self-employment and the pandemic

Childcare

Studies of unpaid domestic work tend to consider childcare and housework separately since they have a number of differences. For example, childcare in general is viewed as more important, pleasurable and rewarding than housework (Sullivan, 2013), and men, on average, are found to be increasing their contribution to childcare. However, despite being seen as more rewarding, *'the day-to-day aspects of making that [childcare] happen, especially when children are very young, are not in and of themselves rewarding'* (Davis and Greenstein, 2013, p.68), resulting in complex patterns in the increased male participation in child care, such as taking over pleasurable aspects or not being solely responsible for childcare, termed 'joining in' rather than 'taking over' (Craig and Churchill, 2020).

In their study of the impacts of self-employment and entrepreneurship on childcare, (Drew and Humbert, 2012) observe that many fathers who are employees cite that their employment limits their involvement in childcare and entrepreneurship offers the opportunity for more control. However, they find that *'fathers do not use entrepreneurship as an opportunity to achieve a more symmetrical distribution of entrepreneurial work and caring'* (p.63). In contrast, much literature suggests that women seek self-employment and entrepreneurship as a means of balancing work and childcare (Ekinsmyth, 2013, Duberley and Carrigan, 2013). Whilst this is often framed as a positive and beneficial choice, Foley et al., (2018)'s study finds that whilst self-employment is described by mothers as allowing independence, it is in fact the only way they can manage the *'temporal and perceived moral obligations of motherhood'* (p.325) and find fulfilling work. Independence is not therefore the positive pull factor it appears, rather mothers are often pushed into self-employment due to social factors recognised by the 'doing gender' theoretical lens and institutional voids such as, flexible working or lack of childcare that is affordable or is consistent with working patterns.

(Hupkau and Petrongolo (2020) investigate the effect of COVID-19 on childcare and housework in the UK amongst employees and the self-employed combined. While men had increased the time that they spend on childcare by an average of 6.9 extra hours compared to before the pandemic, women undertook a larger amount of the increased childcare needed due to school, nursery and childcare closures at an average of 9.5 extra hours. This resulted in an average gender gap of an additional 11.7 hours of childcare by working women in the UK

during the pandemic compared to their baseline comparator of 2014-15. Similar, findings of increased childcare by men during the pandemic, but smaller than the increases experienced by women were found in Australia (Craig and Churchill, 2020), US (Zamarro and Prados, 2021) and a multi-country study (De Pedraza et al., 2020) All of these studies combined employees and the self-employed. These latter authors find no psychological impact on women of this additional childcare. However, the more detailed study in the US of (Zamarro and Prados, 2021) finds a negative psychological impact that was still evident four months into the pandemic, indicating that the additional domestic work was leading to poorer mental as well as paid employment outcomes for women.

Housework

Housework describes the work required to maintain a household/home and care for those who live in it. The tasks include '*cooking, cleaning, shopping, repairs, and maintenance, but also to more amorphous tasks such as running errands or paying bills*' (Geist and Ruppner, 2018) (p.242). These tasks are often split into routine and non-routine tasks, with women not only taking a greater overall share of housework, but also a greater share of routine tasks, which tend to be viewed as less skilled (e.g. cleaning compared to DIY). The central tenant of studying housework is the notion that it is, on average, disliked, undervalued and unremunerated. Hence people will seek to minimise the time they spend doing it, which may include buying in services, the use of labour-saving devices, online shopping and eating convenience foods. Supposing any remaining tasks cannot be ignored, the assumption is that they would prefer to see their partner do them, while they did something else, either paid work, housework that is seen as more rewarding such as DIY or undertake 'deserved' leisure activities.

Multiple studies show that women undertake more housework than men and this is consistent across many developed countries (Sullivan, 2013, Bianchi et al., 2012). There has been evidence of a slight narrowing of the gender gap in unpaid housework, however, progress has been slow and uneven (Sullivan et al., 2018). There has been a slight decrease in women's housework, due in part to well-paid women buying in cleaning services or being willing to leave housework undone, rather than men increasing their contribution (Kabeer et al., 2021). However, there are also changes that have increased the unpaid work of both women and men, including increased shopping due to increased levels of consumption (Sullivan et al., 2018) although online shopping and deliveries which have soared during the pandemic may have changed this.

The extant studies of housework, particularly quantitative studies, have focussed on employees. Of the few quantitative studies of unpaid domestic work and self-employment, Craig et al., (2012)'s analysis of Australian Time Use data shows that self-employed women with children undertake more unpaid work than employee women, while self-employed men's time on unpaid work is similar to employee men, and is less than that of women. Qualitative studies have shown how mothers are both drawn to and balance self-employment and caring for children (Ekinsmyth, 2013, Duberley and Carrigan, 2013, Foley et al., 2018, McGowan et al., 2012). However, these studies are silent on the division of housework. Indeed, in their study of the motivations of self-employed mothers, (Foley et al., 2018) note that the assumption that women would be responsible for childcare was so socially embedded, as suggested by the 'doing gender' perspective, it was never questioned by their research subjects.

Methodology

Data

Our data are taken from the Understanding Society (USoc) panel dataset (Institute for Social and Economic Research, 2021). This dataset started in 2009/10 with a large sample of 40,000 UK households. The same households, and all members aged 16 years or older are re-interviewed annually (Burton et al., 2011). An additional COVID-19 study, to understand the social impacts of the pandemic was first administered to all active adult members of USoc in April 2020 (n=42,330) and again in every month until July 2020 and every two months thereafter. The survey was live online for seven days towards the end of the month (Institute for Social and Economic Research, 2020). At the time of our study, seven waves of the COVID-19 study were available spanning April 2020 (wave 1) to January 2021 (wave 7). For our study, we exploited the unique design of the USoc and created a derived, longitudinal dataset with pre-COVID-19 variables of interest and the same variables for each of seven available COVID-19 survey rounds. Our study therefore covers the period pre-pandemic to end-January 2021. Social restrictions to curb the spread of the pandemic varied over the period of our data. For example, waves 1, 2 and 7 (April 2020, May 2020 and January 2021) represent national lockdowns with requirements or advice to stay at home, although some other factors varied over these three periods, such as the definition of key workers.

Our longitudinal dataset has clear advantages over cross-sectional survey data. We are able to consider impacts over the extended and varied nature of the response to the pandemic. Repeated measures are available allowing us to derive at a fuller and more robust models compared to cross-sectional data. Finally, information from the COVID-19 Study linked to the (pre-COVID) comprehensive main USoc panel study allows us to directly compare some variables before and during the unfolding pandemic, allowing us to investigate change associated with the pandemic.

A limitation of our data is that we cannot link all partners and spouses in the dataset. Notably, the USoc main study is a household panel study that allows household and matched partner analysis. In contrast, the Covid-19 Study is a survey of individuals. The Covid-19 Study user guide suggests that partners/spouses can be identified through using the partner ID of the last main survey and the address ID of the Covid-19 study that allows all respondents to be identified that live at the same address. If this includes the partner from the last survey and the respondent still lives as couple, then it is very likely that this is the current partner/spouse. We followed this guide but the matched partner sample differs significantly from respondents who live as couple and for whom we could not match partner information. Respondents in the latter sub-sample were significantly younger. We therefore did not match some partners for our analysis.

Variables

Unpaid work

Time spent on childcare (including home schooling) is captured in the COVID-19 Study. However, an equivalent question is not available in the main USoc study so that we cannot measure change for this activity caused by the pandemic.

Housework undertaken by the individual was measured by the average number of hours of housework undertaken each week. This was captured in the main USoc study before the pandemic (taken from the 2019 interview) and in five of the COVID-19 surveys (waves 1 (April), 2 (May), 3 (June), 5 (September) and 7 (January 2021)). We can therefore directly

measure an increase (decrease). The question in the main USoc (About how many hours do you spend on housework in an average week, such as time spent cooking, cleaning and doing the laundry?) and the COVID-19 Study (Thinking about last week, how much time did you spend on housework, such as time spent cooking, cleaning and doing the laundry?) are directly comparable.

We further explore the unpaid work provided by self-employed women during the pandemic through adding up the hours spent on housework and hours spent on childcare for the pandemic months. As stated above, we cannot derive an equivalent measure for a point in time prior to the pandemic with the Understanding Society as we do not have time spent on childcare prior to the pandemic. Similar to the measures of housework, we are able to derive this measure of 'unpaid work' for the five waves noted above.

To explore the division of unpaid labour in the household, both the main USoc study and COVID-19 study ask respondents who does the grocery shopping, cooking, cleaning, washing/ironing, gardening, DIY and childcare. Gardening and DIY are non-routine tasks, also often hobbies, and may therefore distinct from the routine tasks that are required for maintaining a functioning household on an everyday basis (Geist and Ruppanner, 2018). We therefore derive an index of unequal division of labour that only includes routine tasks and counts whether the respondent does primarily the grocery shopping, cooking, cleaning, washing/ironing and childcare. Our derived index can take values from 0 (when the respondent does not do any of these tasks) to 5 (does all of this task primarily). The higher the value (with the maximum value of five), the more domestic tasks the respondents do themselves. As reference point for the division of labour, we use information from the Wave 10 of the main USoc study.

The COVID-19 study also asked respondents with child/ren between 0-18-years old whether they felt an impact of childcare and home schooling on their working hours (yes or no) or the timing of work (yes/no).

Paid work

Each survey in the COVID-19 study captured the number of hours the respondents worked in the last week. As benchmark we use the number of hours they worked in January/February 2020. This information was asked retrospectively when people first joined the survey.

Sample

Our derived sample includes women and men who are self-employed or employees in their main job in the respective COVID-19 survey rounds. We further limit our sample to parents with dependent children 0-15-years-old living in their household. Included in our final sample are 287 self-employed men and 259 self-employed women who lived in together with a partner/spouse and dependent child/ren. This is 41% of self-employed women in the study sample and 36% of self-employed men. The comparison group consists of 1572 men and 1939 women who are employees (including being on furlough) and lived with partner/spouse and dependent child/ren.

Statistical Analysis

Descriptive analysis of hours spent on childcare (including home schooling), housework, total unpaid domestic work and the division of domestic labour were undertaken using box plots and t-tests. For childcare and total unpaid domestic work, t-tests were used to compare hours of self-employed and employee women and between women and men. For housework

and the division of domestic labour, paired t-tests were undertaken between hours/score before and during the pandemic.

Multivariate analysis was undertaken to explore the relationship between unpaid domestic work and paid hours worked during the pandemic. The dependent variable is 'paid' hours worked (logged) during the pandemic months. We use repeated measures of the same individuals and apply random effects panel models. We restrict the analysis to those who are still at work, i.e. who could reduce their working hours for childcare/domestic labour reasons. We undertake separate models for those who worked full-time (30 hours and more) versus part-time (less than 30 hours a week) before the pandemic started on the basis that the former may wish to continue working on a full-time basis.

We add to our models industry sector that has been highlighted in previous research as key influencing factor of gender inequalities (Graeber et al., 2021). We further add separately measures of unpaid work: i) time spent on childcare (logged), ii) time spent on domestic work (logged), and iii) the derived measure of domestic division of labour. The following controls are used (and not reported): age, highest qualification, works from home and wave dummies. Because some variables are not available each survey round, the reported number of observations and individuals varies.

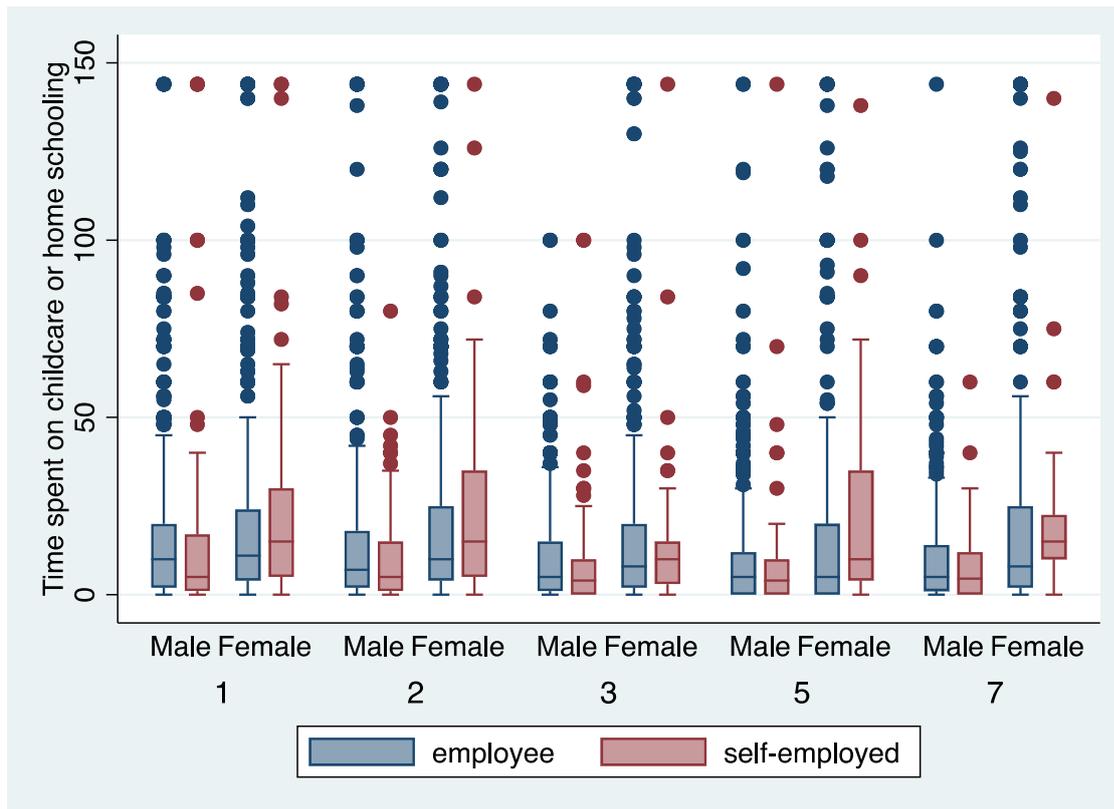
Findings

Childcare and home schooling

The boxplots in Figure 1 show the median and the interquartile range (25th percentile and 75th percentile) of the distribution of the hours spent on childcare and home schooling of self-employed women and men compared to employee women and men. In all waves during the pandemic covered by the study period, the median of hours spent on childcare and home schooling was higher among self-employed women than employee women. Hours of childcare were particularly increased for self-employed women during full lockdowns: wave 1 (April 2020), wave 2 (May 2020) and wave 7 (January 2021).

T-tests (not reported) confirm that self-employed women spent significantly longer hours on childcare than employee women (24.8 hours vs 22.5 hours) averaged over all waves of data collected during the pandemic ($p=0.036$). Our findings further confirm that women, both as employees or self-employed, spent substantially and statistically significantly more time in childcare and home schooling than men during the pandemic months. This is generally consistent with previous findings of self-employed and employees together from Australia (Craig and Churchill, 2020). Information on hours spent on childcare is not available for pre-pandemic surveys in the Understanding Society and therefore we cannot investigate further the extent and gendered pattern of change.

Figure 1. Hours spent on childcare and home schooling of previous full-time workers by waves, gender and employment status



Note: Unweighted data; respondents who live with their partner/spouse and dependent child/ren. This question was only asked in waves 1 (April), 2 (May), 3 (June), 5 (September) and 7 (January 2021).

Source: Understanding Society Covid-19 Study

Hours spent on domestic work

In line with previous of combined employees and self-employed, we find significant increases in hours spent on housework among female and male employees (Hupkau and Petrongolo, 2020, Zamarro and Prados, 2021). Self-employed men who worked full-time prior to the crisis also experienced on average a significant increase in domestic work due to the pandemic (compared to 2019). However, this does not apply to self-employed women. The time self-employed women, whether full-time or part-time, spent on housework has on average not changed in the pandemic. This is because self-employed women had substantially higher levels of domestic work before the pandemic. Employee women during the pandemic increased their hours of domestic work to the levels self-employed women experienced before the pandemic.

Table 1. Hours of housework during the pandemic and prior to the pandemic (2019), paired t-tests

	Full-time employed pre-Covid-19				Part-time employed pre-Covid-19			
	Mean		Sig.	Obs.	Mean		Sig.	Obs.
	Covid-19	Pre-Covid-19			Covid-19	Pre-Covid-19		
Self-employed								

Women	13.8	13.4	n.s.	115	17.2	16.7	n.s.	141
Men	8.8	5.5	***	232	12.9	14.2	n.s.	24
Employee								
Women	13.3	10.7	***	1182	15.7	14.1	***	878
Men	9.2	6.4	***	1573	11.6	10.6	n.s.	67

Note: Unweighted data; respondents who live with their partner/spouse and dependent child/ren. This question was asked in the Understanding Society Covid-19 Study in waves 1 (April), 2 (May), 3 (June), 5 (September) and 7 (January 2021). The pre-Covid-19 data come from the wave 10 of the Understanding Society Main Study.

*Significance level: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, n.s. = not significant at 5%*

Source: Understanding Society Covid-19 Study & Understanding Society Main Study (wave 10 or 11)

Aggregate unpaid domestic work during the pandemic

Our derived measure of unpaid work reveals a significantly higher level of unpaid work among self-employed women compared to employee women who worked full-time prior to the pandemic (in January/February 2020). This is a result of their high hours of housework prior to the crisis and their increased hours of childcare and home schooling during the pandemic. In contrast, there is not a statistically significant difference between the hours of unpaid work undertaken by self-employed women and women employees who worked part-time during the pandemic. For men, there is no statistically significant difference across employment types or full-time or part-time working.

Table 2. Hours spent on unpaid work during the pandemic

	Full-time worker pre-Covid-19			Part-time worker pre-Covid-19		
	Mean	Sig. ¹	Obs.	Mean	Sig. ¹	Obs.
Women						
Self-employed	38.9	***	285	43.9	n.s.	318
Employees	31.7		3155	41.1		2299
Men						
Self-employed	20.5	n.s.	561	25.4	n.s.	92
Employees	21.5		4375	26.9		141

Note: Unweighted data; respondents who live with their partner/spouse and dependent child/ren. Unpaid work adds up hours spent on housework and hours spent on childcare and home schooling from waves 1, 2, 3, 5 & 7.

*Significance level: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, n.s. = not significant at 5%*

¹T-test self-employed compared to employees within women/men

Source: Understanding Society Covid-19 Study

Domestic division of labour

Table 3 shows the mean values of our derived domestic division of labour index (based on routine domestic tasks) directly compared for the same respondents during the pandemic with their pre-pandemic score. The lower (higher) the mean the less (more) tasks are the respondents doing primarily themselves in the household. Self-employed women who worked part-time pre-COVID lived in the most unequal households prior to the crisis. They have not experienced a change in the domestic division of labour. They are still providing a large share of the domestic responsibilities themselves. The same is found for part-time working female employees although their aggregate index level was slightly lower compared to part-time self-employed women. Full-time working women (pre-COVID) experienced a significant increase in their household share.

Men in this sample have low values of our shared domestic work index, meaning that only in rare cases they primarily undertook tasks themselves instead of their partners or external help/services. The values for full-time men, both in self-employment and paid employment, have significantly increased in the pandemic – but on a very low level compared to women.

Table 3. Domestic division of labour index, paired t-tests

	Full-time employed pre-Covid-19				Part-time employed pre-Covid-19			
	Mean		Sig.	Obs.	Mean		Sig.	Obs.
	Covid-19	Pre-Covid-19			Covid-19	Pre-Covid-19		
Self-employed								
Women	3.12	2.84	*	92	3.63	3.73	n.s.	103
Men	0.58	0.37	**	151	1.13	0.74	*	31
Employee								
Women	2.72	2.63	*	936	3.47	3.45	n.s.	751
Men	0.72	0.49	***	1270	0.81	0.86	n.s.	43

Note: Unweighted data; respondents who live with their partner/spouse and dependent child/ren. The index is composed of five routine tasks with value =1 if the respondent is doing them primarily in the household and 0 if the partner is primarily doing them, these are shared equally or done by neither partner primarily. The compound takes six values ranging from 0 to 5.

*Significance level: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, n.s. = not significant at 5%*

Source: Understanding Society Covid-19 Study & Understanding Society Main Study wave 10

Changes in paid working hours and work timing due to childcare and home schooling

Tables 4 and 5 present bivariate tests for proportions of respondents reporting reductions in paid working hours and the changes in the timing of paid work respectively due to childcare or home schooling during the pandemic. Across all groups, self-employed women had the highest proportion experiencing reductions in paid working time *and* changes in the timing of their paid work. The impact on self-employed women's paid work was generally larger in relation to the reduction in working time than the change in timing of working time and

varied, as expected, by the extent of lockdown and school closures. However, self-employed women also significantly differed to employee women in having to adapt the timing of work.

Self-employed men also had significantly higher proportions of those who had to reduce their working time compared to employee men and the difference became more pronounced the longer the pandemic lasted.

Table 4. Proportions of self-employed and employees reporting working time reductions by gender and survey waves

	Waves 2 & 7 (lockdown)			Wave 3 (some school opening)			Wave 5 (schools open but local lockdowns)		
	Men	Women	Sig ¹	Men	Women	Sig ¹	Men	Women	Sig ¹
Self-employed	18.2	39.4	***	18.3	41.8	***	14.8	17.1	n.s.
Employee	12.7	17.4	***	9.9	17.1	***	4.2	7.6	**
Sig ²	*	***		**	***		***	**	
n s/emp	258	236		126	141		108	111	
n employee	1,725	2,186		918	1,189		819	1,017	

Note: Unweighted data; only respondents who live with their partner/spouse and dependent child/ren.

¹Chi Square test women compared to men within self-employed and employees

²Chi Square test self-employed compared to employees within women and men

Significance level: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, n.s. = not significant at 5%

Source: Understanding Society Covid-19 Study

Table 5. Proportions of self-employed and employees reporting change of timing of work by gender and survey waves

	Waves 2 & 7 (lockdown)			Wave 3 (some school opening)			Wave 5 (schools open but local lockdowns)		
	Men	Women	Sig ¹	Men	Women	Sig ¹	Men	Women	Sig ¹
Self-employed	28.9	48.7	***	29.4	49.7	**	25.7	39.9	n.s.
Employee	33.6	41.3	***	33.6	40.1	**	19.4	20.2	n.s.
Sig ²	n.s.	*		n.s.	*		n.s.	***	
n s/emp	256	238		126	141		109	111	
n employee	1723	2182		918	1186		820	1018	

Note: Unweighted data; only respondents who live with their partner/spouse and dependent child/ren.

¹Chi Square test women compared to men within self-employed and employees

²Chi Square test self-employed compared to employees within women and men

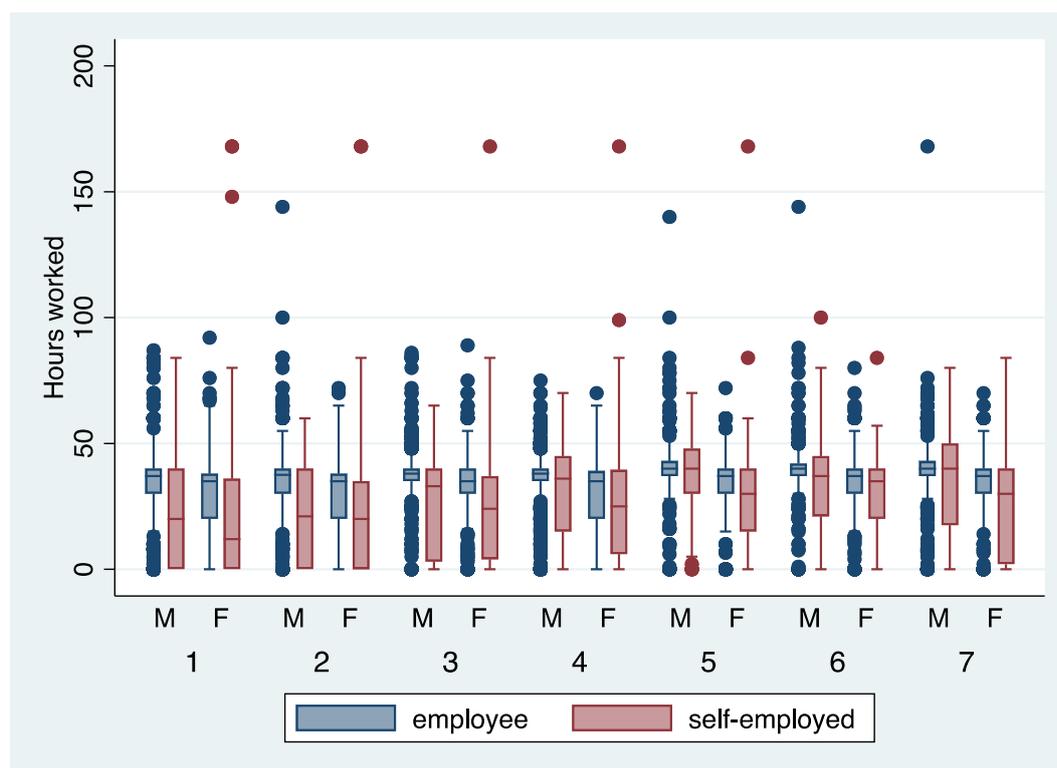
Significance level: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, n.s. = not significant at 5%

Source: Understanding Society Covid-19 Study

Self-employed women also worked significantly fewer hours than self-employed men and their female counterparts across all waves in our study period, underlining that they were most likely to answer that they had to reduce their hours worked because of childcare or home schooling. Figure 2 displays the reported hours worked of all women and men who worked full-time prior to the pandemic (in January/February 2020) as box plots by waves (1-7). Note that furloughed workers are included in these figures.

For both self-employed women and men, the differences were large compared to their employee counterparts during the first three waves until end of June when COVID-19 restrictions were substantially relaxed. The median of self-employed men caught up with employee men in wave 5 (September 2020) although the variation of working hours remained high among the self-employed. However, self-employed women’s median was still below the median of employee women in September 2020 and the gap widened again in the January 2021 lockdown, with one quarter of self-employed women who previously worked full-time falling back to hours close to zero.

Figure 2. Hours worked by gender, employment status and wave, full-time workers in Jan/Feb 2020

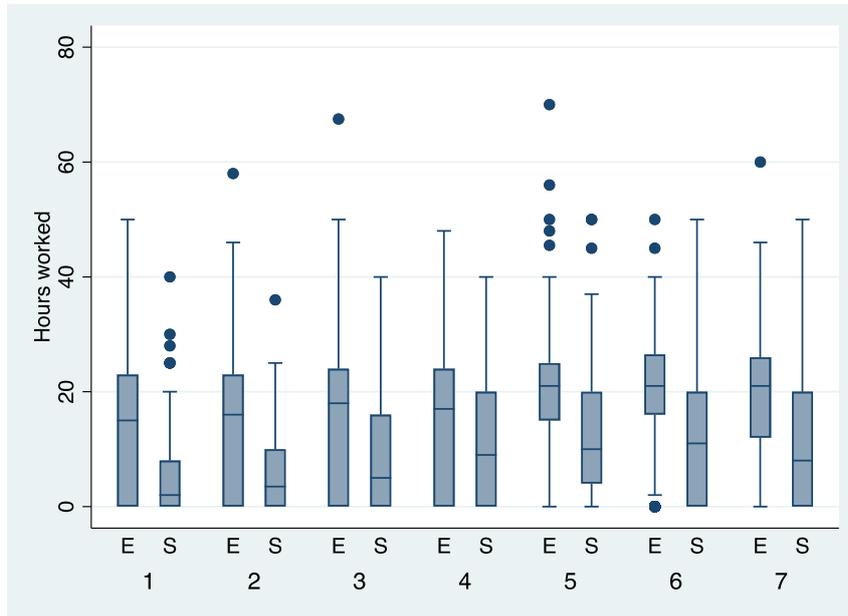


Note: Unweighted data; only respondents who live with their partner/spouse and dependent child/ren.

Source: Understanding Society Covid-19 Study

Among women who worked part-time in Jan/February 2020, the differences in impact on working hours between self-employed and employee women are even more pronounced (Figure 3).

Figure 3. Hours worked of women who worked part-time in Jan/Feb 2020, employees (E) and self-employed (S) by wave



Note: Unweighted data; only women who live with their partner/spouse and dependent child/ren.

Source: Understanding Society Covid-19 Study

Multivariate analysis of impact of unpaid domestic work on paid work

Table 6 reports findings of hours worked during the pandemic for the self-employed and employees who worked full-time before the pandemic (in Jan/Feb 2020). We include an interaction term between self-employment and gender (women) to directly test gender differences among the self-employed compared to employees.

The significance of the self-employed and women interaction term in M1 confirms that self-employed women who used to work full-time had disproportionately reduced their working hours compared all other groups: employee women and both groups of men. This adverse impact on self-employed women is still statistically significant after controlling for industry segregation (M2).

Models 3 and 4 confirm the detrimental impact of time spent on childcare and housework on hours worked during the pandemic months. Importantly, in these models the interaction term between self-employment and women is no longer significant, indicating that their significantly reduced working hours is related to their time spent on unpaid caring and domestic labour rather than other variables in the model such as industry sector or the control variables (age, highest qualification, works from home).

Table 6. Hours worked (logged), self-employed and employees who worked full-time in Jan/February 2020, coefficients with standard errors

	M1	M2	M3	M4	M5
Self-employed. (ref. employees)	-0.199*** (0.027)	-.179*** (.030)	-.224*** (.036)	-.222*** (.032)	-.178*** (.035)
Female (ref. Male)	-0.111*** (0.016)	-.097*** (.017)	-.090*** (.019)	-.068*** (.018)	-.026 (.025)
Self-employed × female	-0.131** (0.048)	-.146** (.051)	-.031 (.059)	-.087 (.055)	-.137* (.056)
Industry (ref. production)					
Wholesale, retail, hospitality	-	-.078** (.028)	-.054 (.034)	-.056 (.030)	-.056 (.031)
Transport, communication	-	-.007 (.025)	.017 (.030)	.001 (.027)	-.003 (.028)
Finance, insurance, prof & admin services	-	-.017 (.022)	-.009 (.026)	-.024 (.023)	-.021 (.025)
Public admin, education, health, social services	-	-.035 (.021)	-.037 (.025)	-.039 (.023)	-.034 (.024)
Arts, recreation, entertainment, other services	-	-.060* (.023)	-.071* (.029)	-.072** (.025)	-.056* (.026)
Time spent on childcare (logged)	-	-	-.028*** (.005)	-	-
Time spent on housework (logged)	-	-	-	-.059*** (.007)	-
Index of domestic division of labour	-	-	-	-	-.034*** (.007)
Number of obs.	9,476	8,850	4,930	6,177	7,428
Number of respondents	2,381	1,952	1,655	1,861	1,595
R2 (overall)	0.060	0.059	0.070	0.080	0.069

In M5, the index of domestic division of labour is negative and statistically significant suggesting that the more respondents live in unequal households and have to do domestic routine tasks themselves, the fewer hours they work. However, the self-employment and women interaction term in M5 is statistically significant and negative, suggesting that the division of labour does not directly relate to the differential reduction in working hours experienced by self-employed women. The coefficient for gender in M5 is non-significant, suggesting that the unequal division of domestic labour, rather than gender, is a better explanatory variable for the reduction in working hours among employees. That is, it not being a woman *per se* that is associated with a reduction in working hours, but that undertaking of a large share of domestic duties, which is usually undertaken by women, is associated with a reduction in paid working hours during the pandemic.

The separate models for those who were part-time self-employed and employees before the pandemic showed no gender differences, suggesting that men who worked part-time show similar relationships between the dependent variable, paid hours worked, and the explanatory variables.

Discussion

The findings of our study show that self-employed women in the UK, particularly those that worked part-time prior to the pandemic shouldered the greatest amount of childcare and home schooling during the pandemic, compared to employee women and men, whatever their employment type (Figure 1). Self-employed women, both full-time and part-time, did not increase their average hours of housework per week during the pandemic, mainly because this was high beforehand, particularly for part-time self-employed women (Table 1). Studies have shown that overall childcare and housework increased during the pandemic (Zamarro and Prados, 2021), and we show that most groups of men increased the time spent on housework during the pandemic, but not to the levels of either self-employed or employee women.

Our novel index of the division of domestic labour highlights that even before the pandemic, self-employed women lived in the most unequal households than all other groups (Table 4). That is they were primarily responsible for more household tasks such as cooking, cleaning than their partners. This lack of equality did not change during the pandemic, with self-employed women continuing to live in the most unequal households. While our index is novel, our findings accord with previous studies that find that men are more likely to join in domestic labour and caring, rather than take full responsibility (Sullivan, 2013). This difference has not been explored in extant literature. We posit that analysing the division of domestic labour provides a different and important perspective to routine comparison of hours spent on childcare or housework by women and men. Taking prime responsibility for tasks suggests not only more time spent on them, but also more mental labour or headspace in aspects such as planning and problem solving. In contrast, while men's joining in may represent time spent, it suggest an abrogation of the worry and concern associated with prime responsibility for the task. We therefore suggest that our findings show that self-employed women not only spend the most time on aggregate domestic work (Table 2), but that they are additionally burdened with the most mental labour associated with that work. This resonates with previous studies that found that women's mental wellbeing was more negatively affected than men's during the pandemic and lockdowns (Etheridge and Spantig, 2020).

Our analysis of changes in paid working hours and in paid work timing due to childcare and home schooling reveal that self-employed women showed the greatest proportion reporting a reduction in paid working hours and the greatest proportion reporting changes in the timing of their work (Tables 4 and 5). Our analysis at different time points during the pandemic shows that the proportion reporting reduced hours and changes in timing varied according to the social restrictions in place. As may be expected, higher proportions of self-employed women reported reductions in working hours during May 2020 and January 2021 respectively when there were national lockdowns including school closures and this was significantly greater than the proportion of self-employed men reporting reduced paid working hours during these periods. The proportion of self-employed men and women reporting reduced paid working hours declined for September 2020 when schools were open and there were only local lockdowns, reflecting that many were able to resume work, either in their place of work or at home. Interestingly, a slightly different temporal pattern is seen for the change in the timing of paid work. Again, self-employed women have the highest proportion reporting a change in timing of their work and this is statistically greater than the proportion of men reporting a change for May 2020 and January 2021. However, this remains high for both self-employed women and men in September 2020, suggesting that the temporal flexibility often associated with self-employment was beneficial and drawn upon, despite many aspects of paid work and schooling returning to near-normal. In contrast, lower proportions of employed women and men changed the timing of their work in September 2020, suggesting they either did not have this flexibility or did not feel the need for it.

While our descriptive bivariate analyses demonstrate the stark gender patterns of unpaid domestic work experienced in the Covid-19 pandemic, our multivariate analysis provides a possible and overlooked explanation. Previous studies have suggested (Martinez Dy and Jayawarna, 2020; Graeber et al., 2021) that self-employed women are more likely to have experienced reduction in working hours and income during the pandemic due to their over-representation in sectors that were closed for extended periods, such as hospitality and personal services. We have shown that, after accounting for such industry selection, there is a statistically significant association between time spent on childcare and a reduction in paid working hours for self-employed women. Similarly, there is a statistically significant association between time spent on housework and a reduction in paid working hours. This finding underlines the importance of including the study of domestic labour in the study of self-employment and entrepreneurship. Our findings show that the reduction in working hours is associated with domestic labour, rather than industry segregation posited in early studies of the pandemic (e.g. Graeber et al., 2021)

We recognise that it is difficult to establish the direction of causality in studies of domestic and paid labour, which is reflected in the coexistence and complex generative nature of the multiple theories previously discussed. Sullivan (2013) suggests considering childcare and housework separately due to underlying differences. In the case of childcare, the pandemic caused the unique context of school and nursery closures, as well as the inability to draw on informal care such as grandparents and friends. Since most would not leave children unsupervised, it seems likely that the need to undertake additional childcare caused the reduction in working hours reported. More time at home and the inability to hire domestic services is likely to have resulted in the need for more housework. However, given the posited near-universal unpopularity of this activity, and it is possible to leave some of it undone, it would seem that the direction of causality may be opposite to that of childcare. That is, the reduction in paid work caused increased housework. This premise is supported by the popularity of social media postings of baking bread and clearing cupboards while on

furlough. Whilst context and behaviours during the pandemic suggest different causal paths, both resulted in self-employed women undertaking more of both childcare and housework than other groups. Assuming self-employed men have similar paid work flexibility to self-employed women, it would seem that notions of ‘doing gender’ continue to prompt women to undertake more domestic work and for men’s behaviours to perpetuate this expectation.

That our index of the division of domestic labour acted differently in the multivariate analysis (model 5) to time spent on housework (model 4) supports our assertion that this is a distinct measure. We suggest that this measure captures the mental labour involved in being primarily responsible for household tasks and encourage further exploration of this measure and its latent constructs.

Conclusion

It has been observed that crises ‘*can starkly expose longstanding and systemic social problems and this has been the case with COVID-19 and gendered divisions of labor*’ (Craig and Churchill, 2020, p.11). Our study shows that self-employed women undertook more childcare and housework during the pandemic than employee women and men, regardless of their employment type. Through multivariate models, we show that this increase in childcare and housework is associated with reduced working hours. While the direction of causality is complex and difficult to establish, we argue that the context and behaviours witnessed during the pandemic suggest that continued gender expectations underlie this increased domestic work undertaken by self-employed women and the detrimental effect that this has on their paid work. As has been argued by other scholars, it is imperative to understand and address inequalities in unpaid domestic work, since this is inextricably linked to gender inequality in paid work outcomes (Bianchi and Milkie, 2010).

The practical implications of our study include recognising the value of domestic labour. Globally, government responses to the pandemic were predicated on harnessing the domestic sphere. Countries would not have been able to withstand this health crisis without the ability of homes to absorb caring responsibilities, and to provide work places for many. Caring was not only required for children, but also for the elderly, the vulnerable and the thousands who had COVID itself and its after effects. Studies have shown that rather than invest in construction and infrastructure, which are the normal routes to stimulate recovery in economies, investment in care services would provide greater economic and social benefits (Craig and Churchill, 2020).

There are limitations to our study that should be addressed. It was not possible to match fully the individuals in our sample with the data for their partner. It was not therefore possible, for example, to explore how self-employed couples shared childcare and housework, whether there is a zero-sum between the partners, and how they balanced reduced working hours and the timing of their work. Not everyone experienced the same restrictions during the pandemic. For example, key workers were allowed to send their children to school during lockdowns and hence would not have needed to provide childcare, particularly if both of a couple were key workers.

We would suggest that future work further explores our novel index of the division of domestic labour. In particular, qualitative research may be able to reveal the latent constructs associated with having the primary responsibility for household tasks, and also extend this to

having the primary responsibility for childcare. We have suggested that there may be mental labour in carrying this responsibility and future research could seek to explore the validity of this. We are also aware that our study has assumed hetero-normativity in couples. We would like to encourage future work that explores the relationship between domestic and paid work in different types couples. We suggest that studying different types of partnership would also allow a challenge to existing knowledge. Recognising intersectionality would also provide challenge and also reflect the lived experience of many our multi-gendered, multi-racial society.

Acknowledgements

Financial support: UKRI/ESRC grant ES/V008781 “Addressing Inclusivity in the Spatial and Social Impacts of COVID-19 on the Self-Employed in the UK”. Data Source: University of Essex, Institute for Social and Economic Research. (2021). Understanding Society: COVID-19 Study, 2020-2021. [data collection]. 10th Edition. UK Data Service. SN: 8644, <http://doi.org/10.5255/UKDA-SN-8644-10>

References

- Ahl, H. and Marlow, S. (2012) 'Exploring the dynamics of gender, feminism and entrepreneurship: advancing debate to escape a dead end?', *Organization*, 19(5), pp. 543-562.
- Bari, L., Turner, T. and O'Sullivan, M. (2021) 'Gender differences in solo self-employment: Gendered flexibility and the effects of parenthood', *Gender, Work & Organization*, pp. 1-19.
- Bianchi, S. M. and Milkie, M. A. (2010) 'Work and family research in the first decade of the 21st century', *Journal of Marriage and Family*, 72, pp. 705-725.
- Bianchi, S. M., Sayer, L. C., Milkie, M. A. and Robinson, J. P. (2012) 'Housework: Who Did, Does or Will Do It, and How Much Does It Matter?', *Soc Forces*, 91(1), pp. 55-63.
- Burton, J., Laurie, H. and Lynn, P. (2011) 'Appendix: Understanding Society Design Overview', in McFall, S. & Garrington, C. (eds.) *Understanding Society: Early Findings from the First Wave of the UK's Household Longitudinal Survey*. Colchester, UK: University of Essex.
- Craig, L. and Churchill, B. (2020) 'Working and Caring at Home: Gender Differences in the Effects of Covid-19 on Paid and Unpaid Labor in Australia', *Feminist Economics*.
- Craig, L., Powell, A. and Cortis, N. (2012) 'Self-employment, work-family time and the gender division of labour', *Work, Employment and Society*, 26(5), pp. 716-734.
- Davis, S. N. and Greenstein, T. N. (2013) 'Why study housework? Cleaning as a window into power in couples', *Journal of Family Theory & Review*, 5(2), pp. 63-71.
- De Pedraza, P., Guzi, M. and Tijdens, K. (2020) 'Life Dissatisfaction and Anxiety in COVID-19 pandemic', *Global Labor Organization Working Paper No. 544.*, 544.
- Drew, E. and Humbert, A. (2012) '“Men have careers, women have babies”: unequal parental care among Irish entrepreneurs', *Community, Work & Family*, 15(1), pp. 49-67.
- Duberley, J. and Carrigan, M. (2013) 'The career identities of ‘mumpreneurs’: Women’s experiences of combining enterprise and motherhood', *International Small Business Journal: Researching Entrepreneurship*, 31(6), pp. 629-651.
- Ekinsmyth, C. (2013) 'Managing the business of everyday life: the roles of space and place in “mumpreneurship”', *International Journal of Entrepreneurial Behaviour & Research*, 19(5), pp. 525-546.
- Etheridge, B. and Spantig, L. (2020) *The gender gap in mental well-being during the Covid-19 outbreak: Evidence from the UK*, University of Essex, Institute for Social and Economic Research (ISER), ColchesterNo. 2020-08).
- Foley, M., Baird, M., Cooper, R. and Williamson, S. (2018) 'Is Independence Really an Opportunity? The Experience of Entrepreneur-Mothers', *Journal of Small Business and Enterprise Development*, 25(2), pp. 313-329.
- Foss, L., Henry, C., Ahl, H. and Mikalsen, G. H. (2019) 'Women's entrepreneurship policy research: a 30-year review of the evidence', *Small Business Economics*, 53(2), pp. 409-429.

- Geist, C. and Ruppner, L. (2018) 'Mission Impossible? New Housework Theories for Changing Families', *Journal of Family Theory & Review*, 10(1), pp. 242-262.
- Graeber, D., Kritikos, A. S. and Seebauer, J. (2021) 'COVID-19: a crisis of the female self-employed', *Journal of Population Economics*, 34(4), pp. 1141-1187.
- Hilbrecht, M. and Lero, D. S. (2014) 'Self-employment and family life: constructing work-life balance when you're 'always on'', *Community, Work & Family*, 17(1), pp. 20-42.
- Hupkau, C. and Petrongolo, B. (2020) 'Work, Care and Gender during the COVID-19 Crisis*', *Fiscal Studies*, 41(3), pp. 623-651.
- Institute for Social and Economic Research (2020) 'Understanding Society: COVID-19 Study, 2020-2021. [data collection]'. Available at: <http://doi.org/10.5255/UKDA-SN-8644-9> (Accessed: June 21st 2021).
- Institute for Social and Economic Research (2021) *Understanding Society: The UK Household Longitudinal Study User Guide*. Colchester, Essex: University of Essex. Available at: <https://www.understandingsociety.ac.uk/documentation/mainstage/user-guides/main-survey-user-guide/> (Accessed: August 19th 2021).
- Kabeer, N., Razavi, S. and van der Meulen Rodgers, Y. (2021) 'Feminist Economic Perspectives on the COVID-19 Pandemic, Feminist Economics', *Feminist Economics*.
- Lachance-Grzela, M. and Bouchard, G. (2010) 'Why do women do the lion's share of housework? A decade of research', *Sex Roles*, 63(11), pp. 767-780.
- Marlow, S., Henry, C. and Carter, S. (2009) 'Exploring the Impact of Gender upon Women's Business Ownership', *International Small Business Journal: Researching Entrepreneurship*, 27(2), pp. 139-148.
- Martinez Dy, A. and Jayawarna, D. (2020) 'Bios, mythoi and women entrepreneurs: A Wynterian analysis of the intersectional impacts of the COVID-19 pandemic on self-employed women and women-owned businesses', *International Small Business Journal*, 38(5), pp. 391-403.
- McGowan, P., Redeker, C., Cooper, S. and Greenan, K. (2012) 'Female entrepreneurship and the management of business and domestic roles: Motivations, expectations and realities', *Entrepreneurship & Regional Development*, 24(1/2), pp. 53-72.
- Peters, P., Blomme, R., de Jager, W. and van der Heijden, B. (2020) 'The impact of work-related values and work control on the career satisfaction of female freelancers', *Small Business Economics*, 55(2), pp. 493-506.
- Rouse, J., Treanor, L. and Fleck, E. (2013) 'The gendering of entrepreneurship: theoretical and empirical insights', *International Journal of Entrepreneurial Behaviour & Research*, 19(5), pp. 452-459.
- Seck, P. A., Encarnacion, J. O., Tinonin, C. and Duerto-Valero, S. (2021) 'Gendered Impacts of COVID-19 in Asia and the Pacific: Early Evidence on Deepening Socioeconomic Inequalities in Paid and Unpaid Work', *Feminist economics*, 27(1-2), pp. 117-132.
- Sullivan (2013) 'What Do We Learn About Gender by Analyzing Housework Separately From Child Care? Some Considerations From Time-Use Evidence', *Journal of Family Theory and Review*, 5(2), pp. 72-84.
- Sullivan, O., Gershuny, J. and Robinson, J. P. (2018) 'Stalled or Uneven Gender Revolution? A Long-Term Processual Framework for Understanding Why Change Is Slow', *Journal of Family Theory & Review*, 10(1), pp. 263-279.
- Wynarczyk, P. (2005) 'The impact of connectivity technologies on e-flexible working practices of small and medium-sized enterprises in the North East of England', *New Technology, Work & Employment*, 20(3), pp. 234-247.
- Zamarro, G. and Prados, M. J. (2021) 'Gender differences in couples' division of childcare, work and mental health during COVID-19', *Rev Econ Househ*, 19(1), pp. 1-40.