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## Cause for concerns: gender inequality in experiencing the COVID-19 lockdown in Germany

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### ABSTRACT



COVID-19 is having a tremendous impact on gender relations, as care needs have been magnified due to schools and day-care closures. Using topic modeling on over 1,100 open reports from a survey fielded during the first four weeks of the lockdown in Germany, we shed light on how personal experiences of the lockdown differ between women and men. Our results show that, in general, people were most concerned about social contacts and childcare. However, we find clear differences among genders: women worried more about childcare while men were more concerned about paid work and the economy. We argue that the COVID-19 pandemic is affecting women more heavily than men not only at the physical level of work (e.g. women are reducing more paid work hours than men), but also through increasing the division regarding the cognitive level of work (e.g. women are more worried about childcare work while men are about paid work). These developments can potentially contribute to a future widening of the gender wage gap during the recovery process.

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**KEYWORDS** Corona; cognitive labor; pandemic; gender; Germany; topic models

### Introduction

The COVID-19 pandemic has dramatically affected Germans' social and economic lives. To control the virus, many countries, including Germany, took severe measures like curfews, school and border closures or lockdowns. Beginning in March 2020, the German government introduced universal counter measures to slow down the spread of COVID-19, which reduced most activities and services outside the household to a minimum. There is no doubt that such measures have increased time at home with family and children while declining time in paid work for many people. But the main

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question is whether the transition to home-office, home-schooling and self-isolation is hurting women more than men.

Existing research on the Covid-19 lockdown in Germany confirms that mothers predominantly provide childcare, with only a minority of households sharing care work equally among both partners (Möhring *et al.* 2020; Kreyenfeld and Zinn 2020; Hank and Steinbach, 2020). There are similar results from the UK (Andrew *et al.* 2020; Zhou *et al.* 2020), Canada (Shafer *et al.* 2020) and Spain (Farré *et al.* 2020). However, existing gender inequality at home did not seem to increase further by the Corona Crisis in the US (Carlson *et al.* 2020) or Australia (Craig and Churchill 2020). Despite extensive research on the gendered division of labor, we know little about the psychological experiences during the pandemic.

We contribute to the study of the gendered impact of COVID-19 in two important ways. First, we examine the main experiences, concerns or worries individuals were reporting during the first weeks of the lockdown. This is relevant because it shows what particular topics were most salient in Germany. Some experiences like isolation or lack of social contacts are linked to negative outcomes like poor mental and physical health (Thoits 2011; Hawkey and Cacioppo 2010). Second, we analyze whether personal experiences and concerns varied by gender. While previous studies on the impact of COVID-19 on gender inequalities have primarily focused on changes in time devoted to physical or educational tasks (e.g. doing housework, homeschooling), we relate to the *mental load* (i.e. concerns, worries, personal experiences), a theoretically relevant dimension of gender inequality that is largely overlooked in the literature (but see e.g. Daminger 2019; Walzer 1998; Barbeta and Cano 2017). This is particularly important because experiences and concerns reflect hopes and worries that lead to future behavior in form of anticipation, orientation, and action (Holmstron 1999). Therefore, knowing which topics women perceived as more (or less) important than men will inform us about the impact of COVID-19 on the *cognitive dimension* of gender inequality.

By using over 1,100 open reports from an online survey fielded during the first four weeks of the lockdown in Germany, we provide novel evidence on the experiences and concerns of the COVID-19 Crisis. We use a mixed-methods approach separated in a two-step process. First, we employ topic modeling, an inductive machine learning approach, to extract the issues that concerned our respondents most. Subsequently, we statistically test how men and women differ in their concerns.

Second, we qualitatively analyze central quotes reported by respondents in the open survey questionnaire. We believe that our mixed-method approach will help to shed light on the understanding of the impact of COVID-19 on individuals' every day experiences and, ultimately, to disentangle whether this crisis is leading towards a gender convergence, divergence or permanence.

### **Psychological experiences, cognitive labor, and gender inequality during the COVID-19 pandemic**

Given the characteristics of the COVID-19 pandemic, individuals have seen their lives profoundly altered. During the COVID-19 pandemic, the economy shut down and schools were closed in a global response to contend the virus. Starting in March 2020, social distancing measures were at play by most countries, including Germany. Borders were closed and recommendations to self-isolate at home and avoid close contacts were spread across institutions, media and the public discourse (Bennhold and Eddy 2020). Such measures led most families to combine working from home with taking care of, and homeschooling, their children. Other families and individuals lost their jobs or had to stop working for money during the weeks or months until social distancing measures were lifted or eased (Specht 2020). Therefore, we expect that in the description of their personal experiences during the beginning of the COVID-19 lockdown, individuals are particularly concerned about their social life, their economic situation and job security, and how to care for, and educate, their children.

However, our main research question is whether these psychological experiences and concerns differed by gender. Recent studies show that in the 2000s gender inequality remains in place (Dernberger and Pepin 2020) and the gender convergence in paid and unpaid work is rather slow, even during periods of economic recession — when men had significantly more available time due to unemployment (see e.g. Cano 2019). While the Great Recession of 2008 affected men's employment more than women's, COVID-19 is having an opposite effect, impacting women's employment more than men's (Alon *et al.* 2020a; Alon *et al.* 2020b; Collins *et al.* 2020). We hypothesize, therefore, that the current pandemic is also leading toward a gendered effect over concerns, worries, and the cognitive dimension of labor.

Following Daminger (2019: 610) cognitive labor refers to 'the work of (1) anticipating needs, (2) identifying options for meeting those needs, (3)

deciding among the options, and (4) monitoring the results'. In this study, we focus on the cognitive labor sub-dimensions 1 and 2, that is, 'anticipating needs' and 'identifying options for meeting those needs'. While Daminger (2019) expands cognitive labor beyond previous studies that only focused on childcare work (e.g. Walzer 1998) to a more holistic analysis of household work, in our analysis of cognitive labor, we look beyond household work to a more holistic view of work, regardless if it is paid or unpaid, done inside or outside the home. Therefore, we augment the scope of analysis beyond household work, but we only look at its two first dimensions (i.e. anticipating needs and identifying options).

'Anticipating needs' refers to the process of perceiving future problems or opportunities that may arise together with upcoming necessities, while 'identifying options' refers to the process where individuals or couples start thinking and working on the direction towards meeting the needs that have been previously anticipated, which can be something between a quick mental reflection and an extensive research, action or thought (Daming, 2019). We might expect that during the COVID-19 lockdown, the cognitive labor of women was more focused on activities like childcare, while for men it was more focused on paid work or the economy.

A key theory to explain why men tend to spend more time – thinking and doing – paid work and women unpaid work is the *doing gender theory* (West and Zimmerman 1987). This perspective considers that worrying and being concerned about specific activities and actions, e.g. 'care' or 'money' linked ones, is another channel through which individuals *do gender* in their everyday interactions, thoughts, and actions. This is because gender is constituted by 'sex-class-specific ways of appearing, acting and feeling' (Goffman 1977: 303) that serve to *accomplish gender* or to reaffirm membership into a categorical identity (i.e. sex-typed behaviors that *align* members to each other in social situations) (Berk 1985). The accomplishment of gender is put into practice on every-day interactions by doing specific activities, acting in directions, or feeling in ways, that are culturally scripted as feminine or masculine. Thus, by being *particularly concerned* about childcare women *do gender*, while men do gender by being particularly concerned about paid work or the economy. Therefore, we expect women to be particularly concerned about topics like childcare and social contacts, while men be more concerned about topics like paid work and the economy.

## Data

We investigate gender differences<sup>1</sup> in personal experiences and concerns using an online survey fielded between 27 March and 26 April 2020 in Germany (i.e. the first weeks of the lockdown). The data are registered at: [<https://doi.org/10.7802/2034>]; the underlying code is available at: [<https://doi.org/10.17605/OSF.IO/6S7RP>]. The survey was advertised through a press release of the University of Frankfurt shared on the website *Psychologie Heute* and on official Facebook pages of German cities. Respondents were asked to report their personal situation during the lockdown in an open question introduced with: ‘*Social life of many people has changed as the corona virus spreads. Here you get the opportunity to report your personal situation, your family life or your experience of being together in general.*’ This resulted in 1,119 analyzable responses<sup>2</sup> with an average response length of 562 characters. As Table 1 shows, women dominate our sample with 78 percent. Importantly for our comparison, however, the relative distribution of sociodemographic characteristics is similar between genders (see Table 1). For both genders, we oversampled young and highly educated individuals: about 63 percent hold at least a university degree, and 58 percent are younger than 45. Assuming gender equality is higher among younger and more educated people, our findings should be understood as the lower bounds of potential gender differences in Germany. Moreover, we are likely to underreport, for example, financial struggles, which correlate with socio-economic status. However, if we find a gendered impact where we would least expect it (i.e. among the younger and highly educated), effects should be even more severe among the economically deprived.

## Analytic strategy

We used R for the analysis. We organized the open-end survey responses in a document term matrix (DTM), where each row corresponds to a respondent’s answer and each column to a term (word), with each cell

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<sup>1</sup>We focus on differences between respondents who are male and female. 15 respondents in the overall data reported a diverse gender identity, but none of them answered the open question.

<sup>2</sup>We follow the ‘structural sampling model’ (Ibáñez 1979). Therefore, the sampling was done *ad hoc* and intended to collect information on the experiences and meanings given to the COVID-19 lockdown by women and men. Our intention, as in Barbeta and Cano (2017: 16), ‘was not to investigate any aggregate of individual discourses, nor a population universe. The sample developed was structural in nature and aimed to represent a discursive universe linked to macro social groups.’ In our case, the social groups were women and men living in Germany during the lockdown to study gender variations in perceptions of the Corona crisis.

**Table 1.** Descriptive statistics.

Variable	Men (n = 235)	Women (n = 884)
Age		
0–17	0.85%	1.36%
18–29	22.65%	25.65%
30–44	29.91%	32.24%
45–59	28.63%	28.63%
60–74	16.24%	11.35%
75+	1.71%	0.57%
Education		
Primary level or less	1.7%	2.73%
Secondary level	31.91%	35.49%
Tertiary level	66.38%	61.77%
Household		
With partner and child(ren)	27.78%	29.71%
With partner, no children	36.32%	28.68%
No cohabitants	15.81%	18.14%
No partner, with child(ren)	2.14%	5.44%
Other	17.95%	18.03%
Financial satisfaction		
Not satisfied	0.43%	3.79%
Rather unsatisfied	15.15%	12.87%
Rather satisfied	58.01%	56.32%
Satisfied	26.41%	27.01%

counting the occurrence of each term in an answer. To reduce dimensionality, we deleted stop words, terms occurring in more than a fifth or less than 0.1 percent of all answers, non-letter characters and we stemmed terms. For these pre-processing steps, we used the *quanteda* package of Benoit *et al.* (2018). The cleaned data resulted in a DTM with 1,119 rows (usable answers) and 3,135 columns (relevant terms).

To identify the main topics respondents addressed in their answers, we draw upon Structural Topic Modelling (STM) using the *stm* package of Roberts *et al.* (2014). STM identifies which words in the data cluster together, defining each word cluster as a *topic*. STM is a machine-based approach, where the only a-priori decision is the number of topics one wants to identify. We opted for a model with eight topics. In particular, STM yields two posterior probability distributions. First, the distribution of each term's probability to be in each topic (i.e. the clustering of words, Table 2 below). Every topic consists of all terms, but with a varying probability, theoretically ranging from zero (term certainly does not belong to the topic) to one (term certainly belongs to the topic). Second, the eight topics distribute over each individual answer, depending on the words a respondent used. Again, every answer consists of all topics, but with a varying probability. Theoretically, the probability of each topic in an answer ranges from zero (topic does not appear in the answer at all) to one (answer consists only of this topic). We

include gender as a document-level covariate in the STM model, allowing topic probability to vary between women and men (see Roberts *et al.* 2014 for further details on the method).

### Experiences and concerns in Germany during COVID-19

Table 2 shows the terms that are most probable within each topic. One can see that two broader aspects dominate: Social and economic themes. The former, which we consider the topics *Social Contacts*, *Children*, *Family* and *Society*, outnumbers the latter, which corresponds to the last two topics (*Paid Work* and *Economy*). We want to exemplify the content of selected topics by showing those answers that most clearly belong to the respective topic (having the highest probability of the respective topic).

As Figure 1 shows, the most salient topic overall was *Social Contact*, which is perhaps not too surprising, given the nature of the lockdown. This topic has an overall probability of about 14.9 percent to occur in a comment. The topic is mainly concerned with the rapid lack of direct social contacts and the substitution with digital communication. The most probable comment of this topic, coming from a childless woman in her twenties, illustrates this well:

Other than [seeing my boyfriend], I reduced my social life to social media [...] because my family and friends mostly live in another federal state, I do feel quite lonely and miss the direct contact.<sup>3</sup>

Another female participant in a similar situation elaborates this point further:

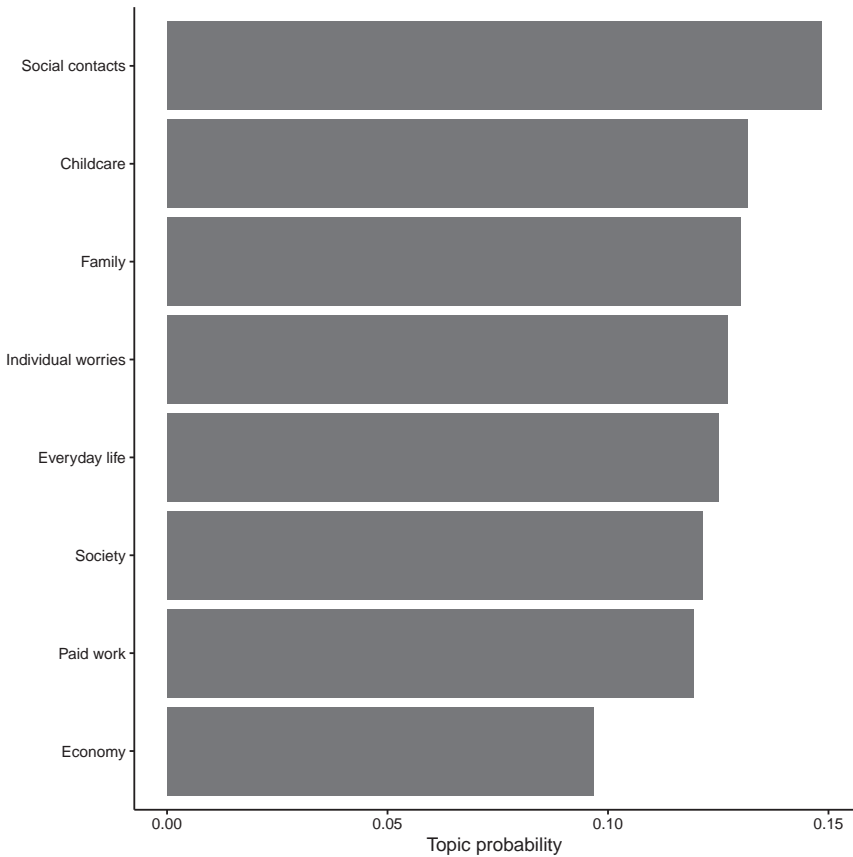
It makes me sad that I cannot see my relatives. Telephone and skype is better than nothing, but it cannot replace a hug and personal contact.

**Table 2.** Most probable terms of each topic.

Social contacts	Childcare	Family	Individual worries	Everyday life	Society	Paid Work	Economy
social	child	mum	worry	shopping	behavior	office	economy
meet	school	week	financially	house	social	home	crisis
at home	homeoffice	house	restrict	distance	environment	action	corona
missing	positive	visit	parents	stop	anxiety	important	Germany
phone	stop	go	do	homeoffice	panic	simultaneously	currently
miss	together	daughter	positive	find	buying		
alone	social	parents	spend	son	old	social	strong
					corona	suffering	social

<sup>3</sup>All translations by the authors.





**Figure 1.** Overall probabilities of topics.

Most respondents report similar struggles and the theme of missing social contacts is central in most narratives. However, some highlight positive changes in their social life as well. For instance, a young woman living with her partner states: ‘[...] At home I spend much more time with my partner, which is very nice!’ and a young female student states: ‘Since the crisis, I enjoy going for a walk with my boyfriend on a daily basis’. This illustrates that positive contacts within the household can be valuable resources for some and help dealing with the rapid reduction in social contacts with friends and families. Nevertheless, the lion’s share of respondents reports severe struggles and worries related to social distancing. Noticeably, none of the most probable comments in this topic come from respondents with children.

The second most salient topic is *Childcare*, with a probability of 13.2 percent. This indicates the crucial importance of childcare for our

respondents. To a degree, this finding reflects the overrepresentation of women in our data. Again, the most probable comment of this topic is written by a woman who says:

It was very nice not to have to keep appointments with the children. We have time for the family and the children have learned many everyday activities (cooking, cleaning up, cleaning, washing clothes ...).

This points to the increased care needs during the lockdown. However, the new situation is not without problems, as she continues:

It is difficult to support the children in school-related matters alongside my job. [...] I notice that my batteries have to be refilled.

On the other hand, the topic *Economy* mainly deals with the lockdown's economic impact on society. One of the top comments is from a young woman without children who is concerned about '[...] many worrying developments [...]: unemployment rates are rising, recession, etc.'. A male respondent urges that the 'health care system should be completely regulated by the state. It cannot be that it is all about money'. Another man complains that 'too much attention is paid to the medical profession and too little to economists.'

Responses of the *Paid Work* topic also concern financial and economic consequences, but on a more personal level. Generally, our respondents seemed rather optimistic at the point of the survey. A woman in her thirties who is working in the public health sector says that she does not want to fear working 'right at the "front"', but hopes that 'we will keep [...] the respect for essential workers', a point several other respondents mention as well. A mother reports that she is glad that 'my employer has great understanding of the challenge of home office / childcare / homeschooling'. Similarly, a female student seems rather carefree, saying that she has a 'secure job that can be done easily from the home office'. However, another female respondent in the same age group fears negative long-term consequences of being forced to work from home: 'I am worried about the higher level of stress caused by the delimitation of private life and work'. Another concern comes from a young man in his twenties who reports that 'personal exchange is missing, whether during work or in private'. The remarkably positive view of one's own economic situation is surely driven by that fact that our respondents were rather young and well educated. However, the point of this analysis is that, regardless of tone or emotion, men were more likely to address these economic issues, as we will show in the following.

## Gender inequality in experiences and concerns during the lockdown

Figure 2 shows the effects on the probability of each topic, where we see clear gender differences. Men talk significantly more often about *Paid Work* and *Economy*, while women address *Social Contacts* and *Childcare* more often. Differences in topic importance, thus, reflect the social situation of both genders: One where the division of paid and unpaid work follows the traditional male breadwinner model – even among those relatively well educated.

That women are more worried about childcare and men about paid work is coming with no surprise and is in tune with our theoretical expectations. We can also consider such gender differences in concerns as part of ‘cognitive labor’, which is another key dimension of gender

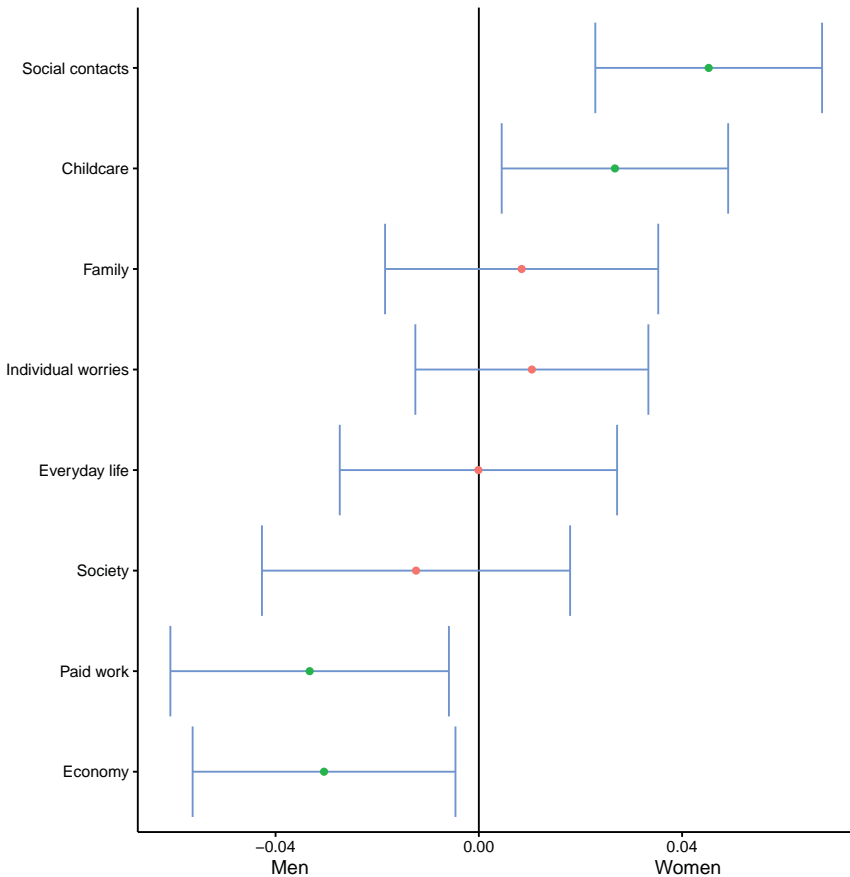


Figure 2. Gender differences in topic probabilities.

inequality in the distribution of labor within different-sex couples. The sum of the stress caused by the pandemic and the unequal gender distribution of cognitive labor might be linked with greater deteriorating career prospects for women than for men and the widening of the gender wage gap during the recovery process. One mother in our sample puts it in this way:

Currently I have to take care of three children, one at school age, one at kindergarten age, and one baby. It is a juggling act. One has to be home-schooled, the kindergarten child wants to play, the baby still needs a lot of care. That is stress. Added to that the limitations of social contacts, which is particularly difficult for the children to deal with. The prospect that the measures will continue for a long time causes me anxiety.

The topics where we do *not* find gender differences are interesting, too. Women and men seem to be similarly worried about the impact of the lockdown on *Society* and about the *Family* in general. There are also no gender differences in topics *Everyday Life* and *Individual Concerns*.

## Discussion and conclusion

We analyzed the main experiences during the first weeks of the lockdown due to the COVID-19 pandemic in Germany and how these experiences differed by gender. Our results show that main concerns were social ones about contacts, childcare and family. Respondents in our study were rather optimistic about the situation during the first weeks of the lockdown, which is in line with research carried out in France, and which labeled this unexpected rise in well-being as the 'Eye of the hurricane' paradox (Recchi *et al.* 2020). Most importantly, handling childcare during the lockdown was not only highly relevant for our respondents but also more often addressed by women. In contrast, men talked more often about paid work and the economy. We interpret these results as a critical indicator of the reproduction of gender inequality in the cognitive dimension of labor during the COVID-19 pandemic in Germany, which is in tune with studies focusing on gender inequality in the physical dimension of work during the pandemic (Möhring *et al.* 2020; Kreyenfeld and Zinn 2020; Hank and Steinbach 2020; Alon *et al.* 2020a; Alon *et al.* 2020b; Collins *et al.* 2020; Andrew *et al.* 2020; Zhou *et al.* 2020). Thus, it seems that the COVID-19 pandemic affects women more heavily than men at the physical level of work (e.g. women are reducing more paid work hours than men) (Collins *et al.* 2020). In addition, the pandemic seems to boost

existing differences at the cognitive level of work further (e.g. women are more worried about childcare work while men about paid work). Both processes may lead to a widening of the gender wage gap during the recovery process (Alon *et al.* 2020b; Grunow and Baur 2014; Leopold *et al.* 2018; Pfau-Effinger and Smidt 2011).

While we believe to offer important insights, our study only shows a fraction of the overall social situation in Germany. Since our analysis mainly includes young and highly educated respondents, the differences we find should be significantly stronger among the elderly or less educated, who both tend to hold more traditional values. We also do not capture some important problems the lockdown may cause, such as increasing domestic violence, child abuse, or mental health issues. Some of these problems relate to gender (e. g. domestic violence), other might not. Finally, we are only covering the first four weeks of the lockdown, but gender inequality and social tensions linked to self-isolation might have increased in subsequent weeks.

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## Disclosure statement

No potential conflict of interest was reported by the author(s).

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