RESEARCH ARTICLE

Matching it up: Non-standard work and job satisfaction

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Abstract
We study the link between working arrangements and job satisfaction and provide novel insights on the (mis)match between preferred and actual working arrangements. We propose an empirical strategy to identify this mismatch at an individual level and apply this approach to data from the European Working Conditions Survey. We demonstrate that the extent of mismatch differs across European countries, and reducing the mismatch between working arrangements and workers could substantially boost overall job satisfaction. We find that the non-standard working arrangements are less frequently mismatched among women and parents. Overall, one-size-fits-all policies to deregulate or curb non-standard working arrangements are not likely to maximize job satisfaction across Europe.

INTRODUCTION

We study the (mis)match between actual and preferred working arrangements. Flexibility enactment theory proposes viewing non-standard working arrangements through the lens of boundary management (Kossek et al., 2004). Building on Lee et al. (2002), this theory posits that non-standard working arrangements (NWAs) put workers under greater pressure to proactively manage boundaries between work and private life as compared to standard working arrangements. A general hypothesis implied by the flexibility enactment theory is that all things being equal, job satisfaction is lowered by the mismatch between individual ability to manage boundaries and the degree of requirement to manage these boundaries ensuing from NWAs. As physical and time barriers between work and home blur, workers are subjected to the additional mental load of maintaining separation between the two domains.

Building on the flexibility enactment theory, we theorize that individuals differ in their ability to manage boundaries (such as varying working hours; working long hours, nights, or weekends; or the

ability to work from outside the official premises) associated with NWAs; some individuals struggle to prevent negative spillovers across life domains as a result. Flexibility enactment theory predicts that the ability to actively manage boundaries mediates the influence of NWAs on job satisfaction. In other words, not everyone is equally able to maintain high levels of job satisfaction under the strain of spillovers between professional and private spheres. The advantages of NWAs may well be the means to reconciling work–home conflicts for some workers. For example, it may be convenient for parents to share the care, when one of them is able to work long hours on specific days and fewer than the regular 8 hours per week on other days. However, as demands from both domains materialize and responses that are adequate in one domain prove to be inappropriate in the other, they give rise to new conflicts between the domains of work and home, both in terms of time and in terms of behavior (Nippert-Eng, 2008). For example, flexible hours may imply cognitive spillovers to leisure, deteriorating health and increasing the psychological strain of work (e.g., Cha & Weeden, 2014; Williams et al., 2013).

Based on these theoretical foundations, we conjecture that ability to manage boundaries (and spillovers) between work and private life is a factor mediating between NWAs and job satisfaction. Workers who are better able to manage boundaries between the two might find that NWAs allow them to attend to their home needs without neglecting their work duties and vice versa. Workers who lack this ability might thrive when boundaries are rigidly established within standard working arrangements. Importantly, some workers may be *mismatched* in terms of working time arrangements and individual ability to manage NWAs. Hence emerges an ambiguous relationship between NWAs and job satisfaction. On the one hand, non-standard working arrangements may allow for greater work–life balance thus contributing to workers' happiness (Atkinson et al., 2011) and productivity (Bloom et al., 2015). On the other hand, NWAs require workers to proactively manage boundaries and not everyone is equally able to maintain high levels of job satisfaction under such strain.

We propose to empirically evaluate the conjecture that the link between job satisfaction and NWAs is heterogeneous. Admittedly, the ability to proactively manage boundaries is latent and thus not observed in the data. To uncover this latent link between job satisfaction and NWAs we use machine learning (ML) methods. We deploy the ML algorithms to obtain data-driven model of the relationship between personal characteristics, job characteristics, and job satisfaction for workers employed in standard arrangements. Based on this model we obtain counterfactual levels of job satisfaction for each individual working with NWAs. The model provides the job satisfaction as if these workers were not employed in NWAs. By comparing the factual and counterfactual job satisfaction we identify the individuals matched to working conditions (their job satisfaction would have been the same even in the absence of NWAs) and individuals who are mismatched (their job satisfaction would have been higher or lower in the absence of NWAs). ML methods fully exploit the data without imposing any ad hoc restrictions in terms of model specification and functional forms. Indeed, we infer the counterfactuals from the deep, complex, and nonlinear underlying links between individual characteristics, job characteristics, and job satisfaction. Consequently, while our approach is rooted in theory, arbitrary modelling choices are avoided.

Empirical evidence to date relies on parametric approaches, and offers mixed evidence. Wheatley (2017) found positive correlations between job satisfaction and working in non-standard arrangements for men, but negative correlations for women. Bellmann and Hübler (2020) argued that patterns for job satisfaction are generally unclear, while the correlations with work–life balance are robustly negative. Individuals with caring obligations appreciate if the employer somehow accommodates their complicated time schedules (Bainbridge & Townsend, 2020). In Europe, full-time work makes mothers less happy than part-time or staying home altogether (Hamplová, 2019). Moreover, flexible hours may imply cognitive spillovers to leisure, deteriorating health and increasing the psychological strain of work (e.g., Cha & Weeden, 2014; Williams et al., 2013). These spillovers are highly heterogeneous across arrangement types and genders, with a multitude of patterns emerging from the data (see Lott, 2015, 2020, for a cross-country comparative study, and for uniquely profound data and analysis for Germany, respectively). In addition, the workplaces that discourage flexibility are considered less attractive by all types of workers (O'Connor & Cech, 2018). From the perspective of employers,

workers who ask for flexible work arrangements are evaluated negatively (Cech & Blaire-Loy, 2014; McCarthy et al., 2013; Munsch, 2016) and as poor workers (Rudman & Mescher, 2013; Vandello et al., 2013), irrespective of their gender. This broad and burgeoning literature notwithstanding, empirical inquiry into the mismatch between the working arrangements and ability to manage boundaries is lacking.

We aim at three contributions to the existing literature. First, to the best of our knowledge, we are the first to operationalize the flexibility enactment theory in a quantitative, empirical context and draw conclusions implied by the theory. Taking the flexibility enactment theory as granted, we characterize types of workers more able to manage boundaries. We do so by overcoming the common deficiency of the data: the ability to manage boundaries is a latent variable, unavailable in the existing data sets. We address this challenge by obtaining counterfactual levels of job satisfaction through machine learning algorithms. This innovation is our second contribution, as parametric estimates of counterfactuals could not deliver reliable results in our context. Third, our analysis is set in an international, comparative context. By using the data from the European Working Conditions Survey, we can characterize the extent and drivers of mismatches between actual and optimal NWAs across individuals and countries.

Our study has relevance for general audiences as well as policy implications. In the context of digitalization and internationalization, it becomes a policy concern if workers experience anxiety about the expectation of 24/7 availability, and about work transgressing their private spaces. These concerns have triggered policy initiatives such as the right to disconnect.[1] Our results may be used to evaluate firm-policies as well as government and transnational policy initiatives.

Our study is structured as follows. The section "Literature Review and Research Questions" provides an overview of the existing literature. In "Data," we present the data and in "Methodology," we introduce our empirical approach. The results of our estimations as well as the counterfactual experiments are discussed at length in the "Results" section. Exploring heterogeneity of the mismatch between actual and optimal working arrangements, we discuss in detail the drivers of this mismatch as well as country-specific implications.

LITERATURE REVIEW AND RESEARCH QUESTIONS

Early on, sociological theory provided several explanations for why individual abilities to proactively manage boundaries may be highly heterogeneous. First, role theory, self-discrepancy theory and social identity theory all emphasize that individuals define themselves through the lenses of how they are perceived by others and by themselves (Kahn et al., 1964; Katz & Kahn, 1978). These lenses are by design individual and thus highly heterogeneous in the sense that the social norms and stereotypes exhibit differently across social classes, education achievement levels, or even local communities. This combination of individual perceptions of oneself and of social norms alleviates or exacerbates work–family and family–work conflicts. This line of scholarly work was further advanced by spillover theory (Westman & Piotrkowski, 1999) and boundary theories (Clark, 2000; Nippert-Eng, 1996). With their specific angles, these theories posit that by integrating life experiences from both personal and work environments, people automatically transmit these experiences across life spheres and thus spillovers, both positive and negative, are unavoidable.

Given that spillovers cannot be avoided, they have to be actively managed. The crux of flexibility enactment theory is that the ability to actively manage the spillovers depends on an individual's general boundary management abilities (Kossek et al., 2004). This is why the individual satisfaction defined from a job depends not only on the specific arrangements at work, but also on the ability to manage

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[1] In Europe, the *Working Time Directive* specifies that the time during which the worker is expected to answer phone calls or emails should count as regular working time, irrespective of whether the phone calls or emails occurred. France and Italy have introduced specific legislation: the former requires that all employment contracts specify which hours are "off grid" for the employers; in the latter the legislation concerns self-employed information and communications technology–based workers. The U.S. perspective is covered extensively by Secunda (2019).

boundaries between work and private life, which is easy for some individuals and troublesome for others. An individual boundary management strategy relates to a combination of boundaries (related to time, space, and sense of belonging) and is defined as a continuum over different aspects of non-standard arrangements.

Despite this rich body of theoretical work in psychology, social psychology, and sociology, the empirical studies of non-standard working arrangements focus on preferences (e.g., Piasna & Drahokoupil, 2021). Often they also isolate one type of NWA, e.g., part-time work or shift work. For example, it was repeatedly established that full-time work makes mothers less happy than part-time or staying home altogether (see Hamplová, 2019, for evidence from Europe). This result extends to individuals with caring obligations, who appreciate if the employer somehow accommodates for complications implied by those obligations (see Bainbridge & Townsend, 2020, for evidence from Australia). Much less effort was devoted to which specific hours are worked, though this was found to be one of the key factors for women's engagement in so-called gig jobs (Cook et al., 2021; Mas & Pallais, 2017). Recently, Lachowska et al. (2023) used a revealed preferences approach to show that the mismatch between desired and actual working hours reduces mental well-being. In addition to differences in preferences, there seem to exist profound differences in time endowments, that is, the ability to occasionally work long hours (Cortes & Pan, 2019; Zapf & Weber, 2017) or specific hours (Cubas et al., 2019; Duchini & van Effenterre, 2018).

Qualitative and quantitative evidence support the hypothesis that job pressure is felt strongly in occupations where time and location boundaries are not set. For example, a study by Schieman and Glavin (2016) corroborated this observation, exploring a nationally representative sample of workers and delineating the job pressure for individuals holding high status jobs, such as professionals and managers. In a study comparing workers from four culturally distant countries, Barney and Elias (2010) argued that, in some cultural contexts, the autonomy in setting one's own schedule actually exacerbates work-related stress. Dumas and Sanchez-Burks (2015) argued in an extensive review paper that the perspective on boundary management and spillovers in the literature alternates between treating them as a tool for handling role responsibilities on the one hand and as a tool for shaping workplace identity and relationships on the other.[2]

In summary, the literature theorizes that working in non-standard arrangements requires individuals to manage boundaries more proactively than standard working arrangements. Systematic evidence on who is able to manage the boundaries is scarcer, both in terms of individual characteristics (such as gender and household structure) and in terms of NWA characteristics (such as the type of non-standard working arrangement). Our study contributes to the literature by empirically addressing three research questions. Note that we do not challenge the flexibility enactment theory. Instead, we test some implications of the theory. In everything what follows, we assume that flexibility enactment theory holds and all inference we provide is conditional on this assumption.

Our study builds on the flexibility enactment theory to provide new empirical results. First, we propose to think about the ability to manage boundaries as a counterfactual: for individuals who work in NWAs we obtain a hypothetical level of job satisfaction if they did not have NWAs, and everything else remained the same. We obtain the difference between the actual and the counterfactual level of job satisfaction for workers with NWAs and study the distribution of this differential. Note that if flexibility enactment theory was not quantitatively relevant for job satisfaction, we should observe that for most individuals there is no difference between the actual and counterfactual job satisfaction.

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[2] There is also ample qualitative evidence that men less frequently request flexibility at work (Vandello et al., 2013). Requesting flexibility is stigmatizing (Munsch, 2016; Rudman & Mescher, 2013; Vandello et al., 2013) and stereotypically associated with different motivations across genders: leisure aspirations for men and family devotion schema for women (Albanesi & Olivetti, 2009; Flabbi & Moro, 2012; Williams et al., 2013). Indeed, men are less likely to receive acceptance on the request for non-standard arrangements if it is for family reasons (Brescoll et al., 2013).

Research Question 1: Is the mismatch between actual and preferred working arrangements prevalent?

We expect that some individuals work under arrangements suited for their abilities to manage boundaries, i.e., those with better abilities are more likely to enjoy flexibility, and those less able work, on average, more frequently under standard contracts. We expect these matched workers to report high levels of job satisfaction. However, some individuals are forced to work under arrangements that challenge their abilities to manage boundaries. These individuals are likely to report lower levels of job satisfaction. While there is no direct way to test that the mismatch is attributed to boundary management, our approach rests upon obtaining the most accurate counterfactual in the absence of NWAs, and thus difference in job satisfactions between actual (with NWAs) and counterfactual (without NWAs) working arrangements is (at least partially) driven by differences in ability to manage boundaries.

Second, we explore if the mismatch is more likely to emerge among workers with specific characteristics. If that is the case, then one could think about the mismatch in a way analogous to heterogeneity of treatment effects across different types of individuals. We consider two dimensions of heterogeneity: gender and parenthood status.

Research Question 2: Is the mismatch between actual and preferred working arrangements systematic?

We expect that ability to actively manage boundaries is higher for women and parents. Notably, caring for relatives is stereotypically a task expected of women. Likewise, parents need to accommodate not only their own boundaries but also those implied by the duty to care for their children. Consequently, women and parents face more spillovers between work and private life, which raises their experience in proactively managing the boundaries. When working with NWAs, they deploy this experience and thus enjoy higher job satisfaction from the granted flexibility. Note that this is not a foregone conclusion: Individuals experiencing more spillover strain may well benefit mentally from clearly delineated boundaries associated with standard working arrangements. Since they may be unable to effectively commit to those arrangements due to their care obligations and the social pressures around those obligations, they may be forced to work in NWAs, to the detriment of their job satisfaction.

Having studied the individual level, we analyze the aggregate implications. After establishing a proxy of mismatch between actual and preferred working arrangements, we investigate whether policies aimed at reducing NWAs raise overall satisfaction. We ask whether the costs identified by the flexibility enactment theory outweigh the benefits that workers can derive from working in NWA, such as the possibility to reconcile job and household demands.

Research Question 3: Can aggregate job satisfaction be raised by removing NWAs?

The existing research finds conflicting results, admittedly studying differentiated sub-populations and different forms of NWAs. We propose to reconcile the literature by quantifying the groups that would benefit from standard rather than NWAs, and the groups that would be harmed by eliminating NWAs.

Despite new research questions and empirical strategy, our study approach draws heavily on the existing literature. Our study takes a similar starting point as Wooden et al. (2009), who studied the role of mismatch between stated, preferred, and actually worked hours in job satisfaction of Australian workers. They show that this mismatch is relevant for full-time workers. Studying Germany, Wunder and Heineck (2013) showed that this mismatch is related to caring obligations, with strong spillovers from a partner's mismatch, not the hours per se. Angrave and Charlwood (2015) relied on longitudinal

data from the UK and showed that potential mismatch has no lasting effects on job satisfaction of workers because they either adapt or change jobs. Lee et al. (2015) showed that job satisfaction may increase when employers remedy hours mismatch reported by workers. However, data on preferred working arrangements are rare across countries and, when available, they are restricted to the number of working hours. This limitation leaves a broad range of non-standard working arrangements under-researched. Furthermore, stated preferences may be inconsistent with actions: measurement suffers from several biases.

Our study differs in three important aspects from previous research. First, we base our conjectures on flexibility enactment theory: our latent variable is the ability to proactively manage boundaries. Specifically, heterogeneity of preferences among workers is no longer required for our empirical approach to be valid. This is relevant because, axiomatically, preferences tend to be constant over time, whereas the ability to proactively manage boundaries may vary over time, jobs, and living arrangements. Second, our empirical strategy does not require information about preferences towards working arrangements. Indeed, our identification relies on counterfactuals emerging from ML methods. Third, we innovate by looking at four different aspects of NWAs, whereas the existing literature typically isolated one aspect, most frequently working hours.

DATA

We use data from the European Working Conditions Survey (EWCS).[3] It is administered across an increasing number of countries, with harmonized sampling methodology and questionnaire. This survey is administered every 5 years. The available data span the years between 1991 and 2015. However, some of the variables necessary for our study are only available starting with the third wave, thus our study covers the period 2001 to 2015.

Each wave of EWCS provides extensive information about the socio-demographic individual characteristics of the workers. In addition to gender and age, individuals report the size of their household, the number and age of children within their household, and their subjective health status, occupation, and industry. Individuals report also the type of contract (temporary or permanent) and the number of hours worked. Self-employment is reported separately from wage-employment. In addition, the commute time is reported. These variables jointly are used in our models as explanatory variables. The full list of variable codes and their transformation are reported in Appendix A.[4]

Clearly, one of the most important aspects of job satisfaction is the earnings an individual receives. An important question is whether workers under flexible schedules are compensated more or less (depending on whether they are considered employment benefits or not) than workers under standard contracts. Also, different types of non-standard working arrangements should compensate workers differently. However, the dataset lacks information on wages.[5] We believe that our proposed method is to some extent robust to the exclusion of certain characteristics, and adding wages would not increase the predictive power of the model significantly once we control for hours worked, occupation, and industry.

We utilize responses for salaried workers, aged between 18 and 65 years of age. Due to specificity of public sector, such as health care or police, we restrict the sample to individuals employed within private entities. Overall, the data covers 27 countries and roughly 58,000 workers.

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[3] https://www.eurofound.europa.eu/en/surveys/european-working-conditions-surveys-ewcs

[4] All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's website and use the search engine to locate the article at http://onlinelibrary.wiley.com.

[5] Questions on exact or range earnings are only asked from the fifth wave onwards. Hence, approximately 65% of the sample misses that information.
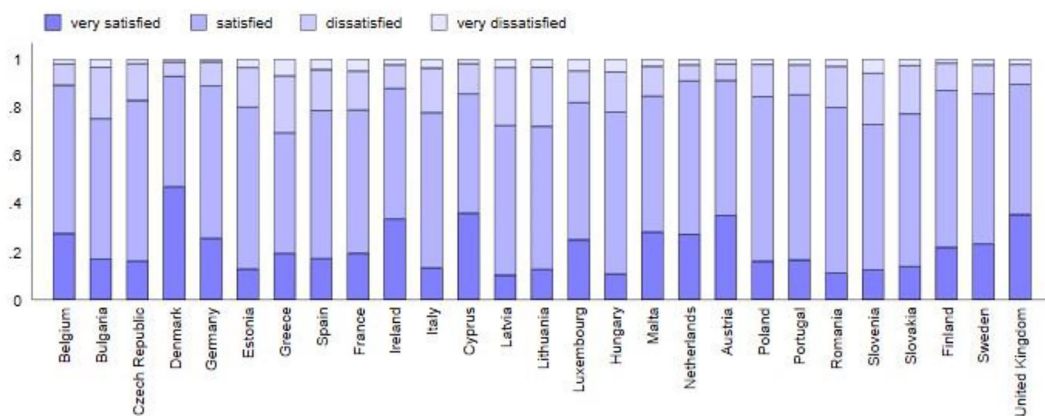
FIGURE 1 Job satisfaction across countries in waves in EWCS.
[Color figure can be viewed at wileyonlinelibrary.com]
Notes: The graph is based on EWCS data from waves 3 to 6.

Job satisfaction

All but the first wave of EWCS include the question, "On the whole, are you very satisfied, satisfied, not very satisfied or not at all satisfied with working conditions in your main paid job?" This variable provides our main indicator of job satisfaction (JS). The answers come on a 4-level Likert scale, ranking from *very satisfied* (1) to *very dissatisfied* (4). On average, 25% of individuals are very satisfied, with an additional 57% of individuals being satisfied. The distribution of job satisfaction across countries is portrayed in Figure 1.

Information on working arrangements

EWCS provides rich information on working conditions, which makes it uniquely suitable for our analysis. The respondents are asked whether they normally face several dimensions of the non-standard working arrangements in their main job.

First, the workers report if their work involves varying hours. This arrangement implies that the worker's starting and finishing times at work vary within a week and between weeks. Prior research focused on shift work, especially evening or night shifts (e.g., Chait Barnett et al., 2008; Han, 2008). By comparison, the questionnaire in EWCS has a broader meaning, as in addition to shift work and rotation, it also includes arrangements where the hours vary between days of the week or within a week in an irregular manner. The literature argues that lack of regularity in working hours is harmful to well-being (Chait Barnett et al., 2008), stability of relationships (Florean & Engelhardt-Woelfler, 2020; Hertz & Charlton, 1989), and parental success (Barnett & Gareis, 2007; Gracia & Garcia-Roman, 2018; Han, 2008). However, the discretion to adjust hours may raise well-being (Grzywacz et al., 2008; see also a review by Bolino et al., 2021). We define a dummy variable taking on the value of 0, when workers report "fixed starting and finishing times" and 1 otherwise.[6]

Second, the workers report if their work involves nights (working hours between 10:00 p.m. and 5:00 a.m.). The effects of working at nights for physical and mental health have been researched in ergonomics (Bohle & Tilley, 1989). They are detrimental for many markers of life quality, such as

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[6] Note that EWCS does not specify if the varying hours are set by the employer or selected autonomously by the worker. The question about autonomy to set working hours was not asked to all workers: roughly 58% of the workers declare no autonomy in setting the hours, but in roughly 24% cases the question was not asked. Thus, the autonomy question could not be used in our study.

sleep quality (Cheng et al., 2021) and mental health (Torquati et al., 2019). Once mainly predominant in caring, policing, and manufacturing, work during the nights is becoming increasingly normalized due to technological changes, especially in large cities (see Mueller, 2019). We obtain an indicator variable that takes on the value of 1 when a worker's schedule involves at least two nights a month and 0 otherwise.

Third, EWCS inquiries about working long hours (more than 10 hours a day). This is not akin to overtime, because it signifies an arrangement in which one or more working days extend beyond the standard 8 hours. Then either the working time is shorter on other working days or there is a larger number of free days per week. Note that such working arrangements can indeed be helpful for caring obligations as well as for personal development, because shorter hours or more free days may be conducive to nurturing non-work-related activities, when family or institutionalized assistance is available on the days of long working hours (Angrave & Charlwood, 2015; Cortes & Pan, 2019). We obtain an indicator variable that takes on the value of 1 when a worker reports long hours at least 4 days a month and 0 otherwise.

Finally, fourth, the workers report if their work involves the weekends. We focus specifically on Sundays given the special cultural role attributed to Sundays as free days across countries in our sample.[7] Working on Sundays is unequivocally forbidden by the law (except dedicated weekend working schedules, in which case it is heavily regulated), even though it may be particularly suitable for combining personal life with professional activity (Cook et al., 2021). We obtain an indicator variable that takes on the value of 1 when a worker reports working on Sundays at least twice a month and 0 otherwise.

In the further analysis, we focus on workers who report none or one of those specific NWAs. Among 58,518 workers in our sample, 28,378 report no NWAs. In addition, 14,924 workers report one of the four above NWAs. The remaining 15,216 workers report two or more NWAs. For example, some workers report that their work involves working on Sundays as well as nights. Given the special status of Sunday work across the European countries, we construct a fifth group, which is a conjunction of Sundays and nights ("Sundays & nights").[8] A second large group are workers who report that their work involves long hours, but the specific start and end times vary between days in a week and/or between weeks.[9] Consequently, we construct a sixth group: a conjunction of varying hours and long hours. Overall, we have six distinct types of NWAs: varying hours, nights, long hours, Sundays, long-and-varying hours, and Sunday nights. After these six distinct groups are formed, we eliminate from the analysis the few workers who report more than one NWA at the time.[10] The final sample consists of 56,107 workers.

Our approach to studying each NWA separately is consistent with the theoretical foundations stemming from Kossek et al. (2004). Specifically, using the individual worker perspective, we focus on the types of non-standard working arrangements that require a proactive management of boundaries. We obtain seven distinct groups of workers. The reference sample consists of workers who report none of the six NWAs. This sample contains 28,378 workers. In addition, there are six distinct groups of workers with NWAs.

Note that each of the six NWAs bring about the risk of transgressions between work and private life. In some cases, though, they may facilitate combining obligations and aspirations in the private life with the work life. Roughly 49% of the workers report NWAs (with a cross-country coefficient of variation = 1.01). We report the distribution of NWAs across countries in Figure 2. The figure

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[7] Respondents in EWCS do not report religion, thus, we cannot identify person-specific days of worship.

[8] This group may be working on Sunday nights or on Sundays *and* during the nights on other days of the week. EWCS does not permit to pin point if these two NWAs exist jointly or separately.

[9] Again, while EWCS is not sufficient to identify if both these features are inherent to the main job, it seems plausible that for this group of workers, a combination of these two NWAs is a designated characteristic of their jobs.

[10] For example, 636 individuals report that their schedule involves both nights work and varying hours. However, this group is too small to obtain reliable estimates.
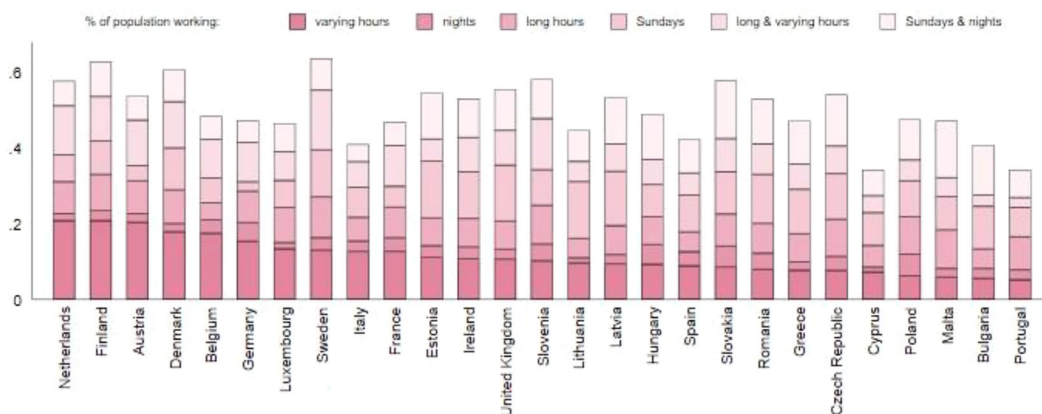
FIGURE 2 Non-standard working arrangements (NWAs) across countries in EWCS.
[Color figure can be viewed at wileyonlinelibrary.com]
Notes: The graph is based on EWCS data from waves 3 to 6. The countries are ordered by prevalence of work in varying hours.

reveals paramount role of varying start and finish times, as well as the prevalence of work on Sundays, with nights and long working hours contributing to a lower fraction of NWAs. The figure also reveals remarkable differences across countries, both in terms of prevalence and in terms of the composition of NWAs.

Descriptive statistics

Table 1 provides the descriptive statistics of our final sample. We report the full sample as well as sub-samples for the reference group and for each of the specific six NWAs. Approximately 40% of our sample are women. Women are less likely to work during the nights, in long hours, and in arrangements combining Sundays and nights. The proportion of women in the reference group is slightly larger than in the full sample, which suggests that women are more likely to work with standard working arrangements than men. Roughly 10% of workers in our sample live in single households, while approximately 12% of individuals in our sample report having one or more children under the age of 7 in the household. Both characteristics are similar across sub-samples. The households in our sample are rarely multi-generational, only 1% to 2% of the individuals share a household with an elderly person. The fact that these characteristics are so similar across the sub-samples suggests that the link between caring obligations for the elderly and non-standard working arrangements is not driven by joint residence in Europe. This observation is consistent with the conflicting empirical evidence presented by Wheatley (2017).

Table 1 additionally summarizes job characteristics. Roughly 11% of workers are employed part-time, with higher figures in the varying hours and Sundays sub-samples. Individuals working at nights and in long hours are rarely on part-time contracts. The proportion of workers who claim working on Saturdays is around 38%, with high correlation of working on Saturdays and Sundays. Table 1 also shows workers' subjective opinions on their working environment. Finally, Table 1 reports the prevalence of non-standard working arrangements in the total sample.

METHODOLOGY

Our starting point is that the difference between actual and preferred working arrangements arise from the fact that some individuals work in schedules inconsistent with their inner ability to manage

TABLE 1   Descriptive statistics.

Variable	Full sample	Reference group	Varying hours	Nights	Long hours	Sundays	Long & varying hours	Sundays & nights
% satisfied with their job	**82.9**	**85.1**	**84.6**	**75.5**	**81.0**	**78.3**	**83.7**	**76.2**
Personal characteristics:								
% of women	40.4	46.1	46.4	23.7	27.7	52.0	20.3	25.6
% of single hh	10.3	10.2	11.5	10.3	9.5	9.4	11.6	10.0
% of hh with a child aged <7 years	12.3	12.0	12.8	13.1	12.2	11.6	14.0	12.2
% of hh with an elder member	1.5	1.5	1.0	1.8	1.1	1.6	1.8	2.2
Job characteristics:								
% working part-time	11.2	11.8	18.5	6.8	4.0	17.5	2.8	7.9
% working on Saturdays	37.6	23.1	30.9	35.8	33.8	89.7	33.5	90.7
% report hours fit schedules	81.9	89.5	86.4	74.7	78.4	71.6	71.1	58.1
% report supportive colleagues	92.7	92.5	91.1	92.4	95.1	92.6	93.2	93.2
% report enough time for tasks	92.8	94.1	93.6	93.5	89.6	92.4	88.1	91.9
% with long commute	29.7	27.0	30.6	28.1	36.2	26.3	40.6	32.0
hazardous conditions (count)	3.03	2.95	2.67	4.00	3.23	3.19	2.78	3.53
NWA:								
% working in varying hours	11.9	0	100	0	0	0	0	0
% working nights	3.6	0	0	100	0	0	0	0
% working in long hours	8.1	0	0	0	100	0	0	0
% working on Sundays	8.4	0	0	0	0	100	0	0
% working long & varying hours	8.7	0	0	0	0	0	100	0
% working on Sunday nights	8.5	0	0	0	0	0	0	100
Observations	**56,107**	**28,378**	**6,312**	**1,728**	**4,461**	**5,577**	**4,408**	**5,243**

Notes: Table presents EWCS data from waves 3 to 6. We report the sample means, weighted. The weighted proportion of workers with standard working arrangements is 50.8%. In addition to the reported variables, we also use the information about age (categorized into 5-year age groups), industry (categorized into agriculture, manufacturing, market services, non-market services and others), and occupation (grouping ISCO categories into low-skilled, medium-skilled, and high-skilled).

boundaries. In order to study the difference between actual and preferred working arrangements empirically, we construct counterfactual levels of job satisfaction. We obtain a model linking individual and job characteristics to job satisfaction for all workers in standard arrangements. We then apply this model to workers actually employed in NWAs and we obtain their job satisfaction as if they worked in standard arrangements, and everything else remained the same. Our approach resembles the well-known Oaxaca-Blinder counterfactuals (Blinder, 1973; Oaxaca, 1973), where parameters from a regression on one gender are used to recover counterfactual average wage for the other gender. We use machine learning (ML) methods to uncover the latent link between job satisfaction and working time arrangements. The ML algorithm predicts job satisfaction as if individuals with NWAs had been working under standard arrangements.

The ML algorithm comes down to a set of decision rules, which, applied to data, provide classification outcomes. In our framework, the data is split according to different values of explanatory variables (here individual and job characteristics) to provide final classification into four levels of job satisfaction. There are two important advantages of this approach over a standard parametric estimation. First, we do not specify a functional form: given all the available variables, the ML algorithm recovers the

deep linkages between individual (and job) characteristics on the one hand, and job satisfaction on the other hand. Second, prediction is a direct classification into job satisfaction levels rather than a parametric prediction; ML thus frees the researcher from setting arbitrary cut-off points for comparing the actual and counterfactual classifications. In other words, we eliminate the scope of arbitrary choices.

Clearly, ML methods do have drawbacks: the need for large sample sizes and commonly outlined difficulty to uncover individual marginal effects for the explanatory variables. We train the model on roughly 28,000 observations, and our main goal is to obtain the most accurate classification. The algorithm that we use does not allow recovering individual marginal effects, nor does it distinguish the relative importance of the different characteristics.[11]

Empirical strategy

We characterize job satisfaction as a function of individual and work characteristics (x_i) and unobserved ability to manage boundaries (u_i), which is crucial if an individual works under non-standard arrangements but is irrelevant when an individual works with standard arrangements (hence the interaction with NWAs).

$$JS_i = f(x_i, NWA_i \times u_i) \tag{1}$$

Denote $\mathbb{X}_0$ the set of individuals who work in standard arrangements and $\mathbb{X}_1$ the set of individuals who work in NWAs. We proceed in three steps:

Step 1. Obtain model of job satisfaction

We train (estimate) the f, a ML model for the determinants of job satisfaction for the respondents, from a reference group $(x_i \in \mathbb{X}_0)$, i.e., individuals who work under standard arrangements. The ML algorithm predicts job satisfaction using workers' individual (e.g., gender, parenting status, age) and work (occupation, industry, part-time indicator, commuting time) characteristics.

From a wide range of machine learning classification techniques, the random forest (RF) classifier (Breiman, 2001) works best in our data.[12] We make this judgment in terms of number of cases correctly classified (i.e., accuracy) as well as the out-of-diagonal elements of the confusion matrix (i.e., the number of cases for which a model predicts a value different than the actual one).

Our final model has high sensitivity (accurately classified cases), and maintains high specificity. Appendix Table C1 reports the actual and the model-implied levels of job satisfaction for the individuals without NWAs. For comparison, we also report analogous results from a standard parametric regression approach, demonstrating superiority of the ML. In fact, an ordered probit model utilizing the same variables assigns 95% of observations to the largest category (*satisfied*), when in the data less than 61% of individuals reported this level. Moreover, the ordered probit model never assigns *very dissatisfied*, and less than 1% of individuals are assigned to *dissatisfied*.

We also validate our predicted job satisfaction by comparing it with an index of job satisfaction that was not used to train the ML models. This index is composite derived from several variables available solely in the sixth wave of EWCS. We estimate correlations between composite index of job satisfaction on the one hand, and actual JS as well as predicted JS on the other hand. The results are reported in Appendix Table C2. We obtain very similar estimates of correlations and R^2 for models with factual and counterfactual job satisfaction.

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[11] Molnar (2022) provided middle-ground, with regression-type ML estimation, but this approach cannot be applied in our case.

[12] We elaborate on the specifics of our use of ML methods in Appendix B.

Step 2. Obtain counterfactual job satisfaction

We use the ML trained model to predict counterfactual level of job satisfaction for respondents in $\mathbb{X}_1$, i.e., individuals who work under non-standard arrangements. We use the decision rules produced by the ML algorithm in the previous point to predict the counterfactual job satisfaction that workers with NWA would have experienced if they worked in standard work arrangements. The ML algorithm recovers $\hat{f}(x_i, [NWA_i = 0] \times u_i)$ if $x_i \in \mathbb{X}_1$, the job satisfaction for an individual with characteristics x_i, where we counterfactually set NWA to be equal to zero. For example, we use the predictive model estimated on the reference group to predict the job satisfaction of individuals who work on Sundays, as if they worked in standard arrangements.

Step 3. Obtain the difference between factual and counterfactual job satisfaction

We construct the difference between the actual and the model-derived counterfactual job satisfaction. In the remainder of this paper we refer to counterfactual job satisfaction "counterfactual JS" and to actual job satisfaction as "factual JS." We can write this difference as:

$$\Delta JS_i = \textit{Factual JS}_i - \textit{Counterfactual JS}_i = f(x_i, NWA_i \times u_i) - \hat{f}(x_i, [NWA_i = 0] \times u_i) \,\forall x_i \in \mathbb{X}_1, \quad (2)$$

where ΔJS_i is the difference in job satisfaction, and *Counterfactual JS$_i$* indicates the levels for worker i in working arrangements NWA. For example, imagine an individual who works long hours ($NWA = 1$) and reports low job satisfaction (4). Given this individual's personal and job characteristics, our ML model indicates that if this worker had been employed in regular working hours (i.e., taking away NWA), her or his job satisfaction would have been 1. Then, the value of the mismatch measure equals the difference in job satisfaction: $\Delta JS_i = 4 - 1 = 3$. In this example, removing NWA would lead to an improvement by three levels.

A comparison of the actual and the counterfactual levels of job satisfaction results in one of three possible outcomes for workers in $\mathbb{X}_1$. First, it can occur that the actual and the counterfactual job satisfactions are the same (a worker is just as well off with and without NWA_i). Second, it could be that job satisfaction is higher in actual than in counterfactual (a worker is better off keeping $NWA_i = 1$ and would lose from having standard working arrangements). Finally, job satisfaction could be lower in actual than in counterfactual (a worker would benefit from changing from $NWA_i = 1$ to standard working arrangements $NWA_i = 0$).

Our objective is to obtain counterfactual levels of job satisfaction for individuals working in non-standard arrangements ($x_i \in \mathbb{X}_1$) *as if* they worked in standard ones ($\mathbb{X}_0$). We want to maximize the sample sizes to avoid the case of singletons: individuals with a given set of characteristics in only one of the two sets ($\mathbb{X}_0$ or $\mathbb{X}_1$). The reference group (all $x_i \in \mathbb{X}_0$) is used to classify individuals into the four levels of job satisfaction. We estimate the model on individuals who work in standard working arrangements and we do predictions for individuals who have non-standard working arrangements. Indeed, we never do predictions for individuals with standard working arrangements. Elimination of singletons assures that the distribution of individuals working in standard arrangements $\mathbb{X}_0$ has common support with the distribution of individuals working in the non-standard ones $\mathbb{X}_1$.

Further analyses: Systematic component of mismatch

Once we complete the three steps, we check whether the difference between actual and counterfactual levels of job satisfaction depends on personal characteristics. We use ΔJS_i as the dependent variable

in a standard regression model. Given that job satisfaction variables have four levels, the differences can take on seven different possible values (three positive, three negative, and no change). Individuals with $\Delta JS_i = 0$ imply that no gain in job satisfaction arises from eliminating NWAs. Positive values of ΔJS_i correspond to greater improvement in job satisfaction if the counterfactual working arrangements were to become factual; analogously, negative values of ΔJS_i imply a decline in job satisfaction.

We utilize ΔJS_i variable in two ways. First, we construct a dummy that takes on the value of 1 if there is improvement in job satisfaction and 0 otherwise. We call this outcome variable improvement. Further, we measure the intensity, i.e., we use the original 7-level categorical variable where larger positive values are greater improvement and larger negative values are greater deterioration of job satisfaction.

We estimate a probability of mismatch in working arrangements in M1 (logit) and intensity of mismatch in M2 (ordered logit), obtained through a counterfactual experiment of taking away NWA.

$$Improvement\left(Y/N\right)_i = \beta_c + \beta_w \times woman + \beta_p \times parent + \gamma woman \times parent + \delta controls_i + \varepsilon_i \; (M1)$$

$$\Delta JS_i \; = \alpha_c + \alpha_w \times woman + \alpha_p \times parent + \pi woman \times parent + \theta controls_i + \varepsilon_i \; (M2)$$

The parameters indexed with c denote country fixed effects. The parameters indexed with w and p reflect the own effects of gender (on non-parents) and parenthood status (on men). The interaction terms γ and π reflect the additional effect of motherhood. We focus on exploring the role of gender and parenting in the mismatch of working arrangements. We thus include the personal characteristics of main importance, i.e., gender and presence of child under 7 years of age in the household. All regressions adjust age and household characteristics. These models are estimated separately in six sub-samples representing six different forms of NWAs.

Further analyses: Country-level analyses

Aggregating the individual results to country-level, we can similarly identify three groups: those for whom non-standard arrangements are optimal, those for whom standard arrangements are optimal, and those who work in non-standard arrangements but would be better off in standard working arrangements. We can compute these measures for each specific NWA, as well as for all NWAs taken together.

Assumptions

Our approach explores deep underlying patterns in the data, in a way similar to Athey et al. (2021). The key assumptions underlying our methodology are as follows.

Assumption 1: There is common support

We assume that we can compute counterfactual $\hat{f}(x_i, [NWA_i = 0] \times u_i) \, \forall x_i \in \mathbb{X}_1$ for everyone in the $NWA = 1$ sub-sample. More generally, assignment to $\mathbb{X}_0$ or $\mathbb{X}_1$ samples is probabilistic in the population. This assumption is mechanically imposed in our approach, because singletons (observations available only in either $\mathbb{X}_0$ or $\mathbb{X}_1$ sample) are dropped from the analysis before the ML model was trained.

Assumption 2: The unobserved ability to manage boundaries (u_i) affects JS only when $NWA = 1$

This means that job satisfaction is independent of ability to manage borders in standard working arrangements (i.e., when one does not need to manage the potential spillovers). From the theory, we additionally expect that $f(.)$ is not decreasing in $NWA_i \times u_i$, i.e., more capable workers can derive higher job satisfaction from working in NWAs than workers who are not able to manage boundaries.

Assumption 3: Individuals are heterogeneous along a single dimension

This means that the ability to manage boundaries is the only unobserved variable affecting job satisfaction that differs systematically between workers with NWAs and without them. Consider that there are two sources of unobserved heterogeneity, such that $JS_i = f(x_i, NWA_i \times (u_i + v_i))$, where v_i could be related to another factor systematically driven by NWAs. If that was the case, then we would not be able to tell apart the difference between u_i and v_i. For example, the additional factor v_i could be related to potential dissatisfaction of individual i with his or her pay, relative to his or her peers who work in jobs with different NWAs than individual i.

   Note that the policy analysis focuses on the removal of NWAs rather than introducing them. This focus arises from our theoretical premises. The theory emphasizes that some workers will have difficulties in setting boundaries when work arrangements are non-standard. Hence, everything else being the same, the existence of NWAs leads to lower job satisfaction on average. For workers who work in standard arrangements we cannot construct the counterfactual job satisfaction if they worked in NWAs, because the term u_i is not defined in this population. Our empirical approach attributes NWAs critical role in determining job satisfaction through an adequate match from the same assumptions as in the standard treatment effect methodology. These rely on Assumptions 1 and 2: common support and conditional independence of treatment and potential outcomes. We provide the full derivation in Appendix D.

RESULTS

We describe the results in three substantive parts, which match the three research questions stated at the beginning. First, we briefly characterize the prevalence of mismatch in the light of our empirical approach, thus we start from Research Question 1. Next, we refer to Research Question 2 and discuss individual level drivers of the mismatch. Third, we provide aggregations of counterfactual NWA to establish the potential scope for job satisfaction gains and losses, to answer Research Question 3. We conclude this section by placing our results in the context of the flexibility enactment theory.

Prevalence of (mis)match in working arrangements

In our sample, for 43% of individuals no change in job satisfaction is implied by comparing actual job satisfaction and $\hat{f}$. Further, 33% of the sample would have observed a decline in job satisfaction if NWAs were removed, whereas the remaining 24% would have seen a rise in their job satisfaction absent NWAs. In other words, the distribution is skewed to the left. Figure 3 presents the distribution of ΔJS_i in our $x_i \in \mathbb{X}_1$ sample.

   Note that positive values arise as high levels of dissatisfaction ($JS \in [3, 4]$) are replaced in the counterfactual scenarios with job satisfaction ($JS \in [1, 2]$). Conversely, negative values of ΔJS_i emerge as job satisfaction is replaced with job dissatisfaction.

   The overall share of 33% of individuals whose job satisfaction would have been lower had they been deprived the opportunity to work with NWAs suggests that on average roughly a third of
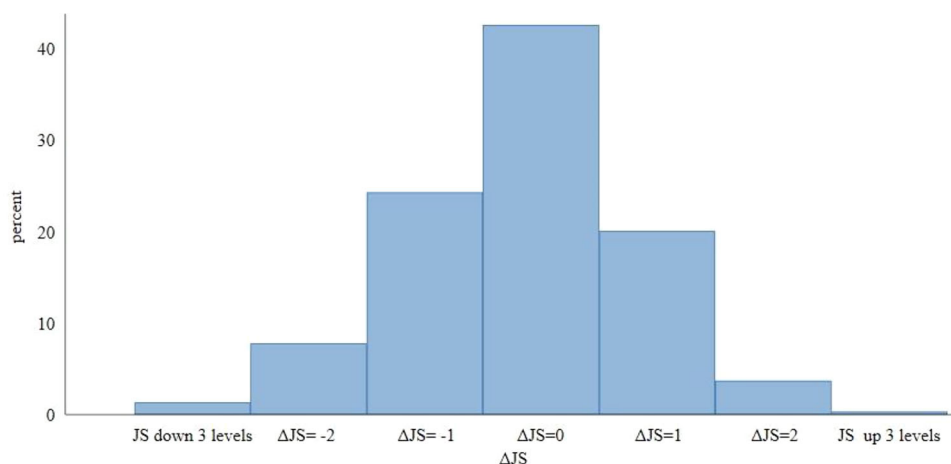
FIGURE 3 Changes between factual and counterfactual job satisfaction.
[Color figure can be viewed at wileyonlinelibrary.com]
Notes: The figures present the distribution of ΔJS_i for $x_i \in \mathbb{X}_1$. Appendix Figure E1 reports a similar graph across NWAs.

individuals with non-standard arrangements have larger benefits from flexibility than experience the strain associated with managing boundaries. These individuals are matched. For the 24% who would benefit from removing NWAs, either the costs of managing boundaries are too high or the benefits of flexibility are too low for the two to balance out. These individuals are mismatched. We next inspect if this dichotomy is driven by gender and parenthood status.

Individual drivers of (mis)match in working arrangements

Research Question 2 considers whether the mismatch between actual and preferred working arrangements is systematic. Specifically, women and parents are less likely to experience mismatch due to higher abilities to actively manage boundaries. Table 2 summarizes the impact of the variables of interest on the probability that removing NWAs improves the job satisfaction of a worker.

We provide two sets of estimates for the event that taking away NWAs improves job satisfaction: the probability of improvement (a *logit* specification, M1) and the seven-level categorical variable measuring the intensity of improvement (ranging from −3 to +3; a reduction of job satisfaction by 3 levels to an improvement in job satisfaction by 3 levels, respectively; an *ordered logit* specification, M2). All specifications include country fixed-effects and year fixed-effects. The former makes sure that our estimates are not affected by differences in mean values between countries. The latter addresses the same concerns for potential time trends (common across countries). Thus, our specifications isolate the effects at the individual level.

Overall, the results reported in Table 2 are consistent for the ordered logit estimators, but the logit estimators are often underpowered to reject the null hypothesis of insignificance. To address this point, we provide further evidence: we combine all NWA sub-samples into one estimation and introduce dummy variables for each NWA. The main objective of this specification is to improve the power of our analysis. The results are reported in the last panel of Table 2 and confirm that overall, both M1 and M2 models deliver similar results, both in terms of magnitude and in terms of significance.

Gender

With the exception of Sundays and Sunday & nights, women's job satisfaction is less likely to improve than for men if their NWAs were replaced by standard arrangements. The results are not robust in M2

TABLE 2   Does taking away NWAs improve job satisfaction?

	Varying hours		Nights		Long hours		Sundays	
	Logit (M1)	OLogit (M2)	Logit (M1)	OLogit (M2)	Logit (M1)	OLogit (M2)	Logit (M1)	OLogit (M2)
Woman (β_w/α_w)	−0.08	−0.12**	−0.13	−0.19***	−0.29***	−0.32***	−0.01	−0.03
	(0.07)	(0.06)	(0.10)	(0.09)	(0.06)	(0.06)	(0.07)	(0.05)
Parent (β_p/α_p)	−0.22**	−0.26***	−0.19*	−0.28***	−0.08	−0.12	−0.31***	−0.31***
	(0.13)	(0.11)	(0.13)	(0.11)	(0.11)	(0.09)	(0.14)	(0.09)
Woman × parent (γ/π)	−0.01	0.04	−0.54	0.01	0.09	0.10	0.15	0.17
	(0.19)	(0.13)	(0.43)	(0.25)	(0.19)	(0.17)	(0.18)	(0.13)
Observations	6,312		1,728		4,461		5,577	
Mean predicted probability	0.29		0.43		0.35		0.32	
Correctly classified	71.25%		58.64%		63.91%		68.10%	
Specificity	100.00%		82.62%		99.82%		99.89%	

	Long & varying hours		Sundays & nights		NWAs jointly	
	Logit (M1)	OLogit (M2)	Logit (M1)	OLogit (M2)	Logit (M1)	OLogit (M2)
Woman (β_w/α_w)	−0.30***	−0.31***	0.01	−0.01	−0.17***	−0.19***
	(0.08)	(0.07)	(0.05)	(0.06)	(0.03)	(0.03)
Parent (β_p/α_p)	−0.41***	−0.25***	−0.21***	−0.20***	−0.24***	−0.23***
	(0.09)	(0.08)	(0.07)	(0.06)	(0.05)	(0.04)
Woman × parent (γ/π)	0.41**	0.23	0.37***	0.29*	0.13***	0.13***
	(0.24)	(0.16)	(0.19)	(0.19)	(0.07)	(0.06)
Observations	4,407		5,243		27,729	
Mean predicted probability	0.35		0.34		0.33	
Correctly classified	65.31%		66.81%		66.63%	
Specificity	98.92%		98.05%		99.59%	

Notes: Table presents the results of estimating an impact of selected individual characteristics on counterfactual changes in workers' job satisfaction when taking away the non-standard working arrangements. Reported are point estimates. The dependent variable for the ordered logistic regression (OLogit) is the change in job satisfaction index (ΔJS_i). For the logistic regression (Logit) we construct a binary variable indicating an "improvement" or a positive change in job satisfaction when NWAs are eliminated. Note that $\Delta JS_i = 0$ (i.e., no change) is classified as 0 in Logit. The variable *parent* takes on the value of 1 if there is a child younger than 7 years old in the household. Models include age, individual country indicators, and wave indicators as regressors. The specification for all sub-samples jointly include additionally a sequence of dummy variables for each type of NWA. Standard errors presented in parentheses. ***, **, and * denote significance at $p < 0.05$, $p < 0.1$, and $p < 0.15$, respectively.

and occasionally lose significance due to low precision in M1. The exact interpretation of the estimated ordered logit coefficients is that the ordered log-odds for a (non-parenting) woman being in a higher job satisfaction category is 0.12 to 0.32 lower than an equivalent (non-parenting) man. Looking at all NWAs jointly, the estimated logit coefficients suggest that the probability that (non-parenting) woman's job satisfaction increases after NWAs are removed is roughly 17% smaller than for (non-parenting) man. This result implies that women's job satisfaction is less affected by the need to manage boundaries, despite the fact that the six studied NWAs create the potential for severe transgressions from professional to private life. For Sundays, as well as Sundays & nights, the effect of gender is absent not only due to low precision, but also because the estimated coefficients are close to zero.

Parenting

Table 2 reveals negative coefficients for fathers of children under 7 years. This result is consistent across all the NWAs, except for long hours where the precision of the estimated coefficients makes them insignificant, but also considerably smaller. Statistical power to reject the null hypothesis is higher in the ordered logit specifications (M2), but the point estimates are similar between M1 and M2. The point estimates suggest marginal effects of roughly 7.9 percentage points on mean prevalence of roughly 33%, i.e., the probability that fathers benefit from the removal of NWAs is on average 24% smaller than for non-parenting men.

The effects of parenting appear similar for fathers and mothers: in the case of most NWAs, there is no statistically significant interaction between gender and parenting young children. The exception are two combinations of NWAs: long and varying hours as well as Sundays & nights. In these two combinations, our models suggest an improvement in job satisfaction for mothers relative to non-mothers and the effect virtually cancels out for mothers relative to fathers. The existing literature argues that parents (or, more generally, care providers) appreciate flexibility (Bainbridge & Townsend, 2020). Our analysis refines this result by showing that there are some forms of NWAs that can be neutral for mothers, but not for fathers, in terms of job satisfaction.

Mismatch in working arrangements across countries

The results in Table 2 specify who is relatively more likely to be matched into NWAs. To address Research Question 3, we aggregate our indicators to the national level. We use the potential outcomes implied by ΔJS_i to classify workers into three groups as described earlier: (i) NWA_i reduces JS relative to standard arrangements, which we classify as mismatched; (ii) NWA_i raises JS relative to standard arrangements, which we classify as matched; and (iii) no change in JS between having and not having NWA_i, which we classify as indifferent. For Research Question 3 the indifferent workers are irrelevant,[13] thus we construct the net measure as a difference between matched NWA workers and mismatched NWA workers. The net is negative if matched share is higher than the mismatched share and positive in the opposite case. Overall, the thought experiment we propose balances between those who would benefit from the elimination of non-standard working arrangements and those who would lose from it. We explore the comparative character of EWCS data and study if there are countries where the mismatch of NWAs is particularly pronounced.

Figure 4 portrays changes in job satisfaction if all NWAs are eliminated, aggregated over all NWAs (analogous bars for specific NWAs are portrayed in Appendix Figures E5 to E9). We present the results separately for men and women (top panel), as well as parents and non-parents (bottom panel). Positive bars signify the share of mismatched workers, i.e. workers with NWAs who benefit from adopting

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[13] The share of indifferent workers is reported across NWAs and countries in Appendix Figure E2 (for all NWAs jointly), and Appendix Figure E3 (across specific NWAs). On average, the share of indifferent workers ranges from 37% to 47%. The share of indifferent workers may be an artefact of the way job satisfaction is measured in EWCS (a 4-point Likkert scale). It is also plausible that for some individuals the trade-offs on average balance out and thus they could fluctuate between NWAs and standard arrangements without detriment to their job satisfaction.
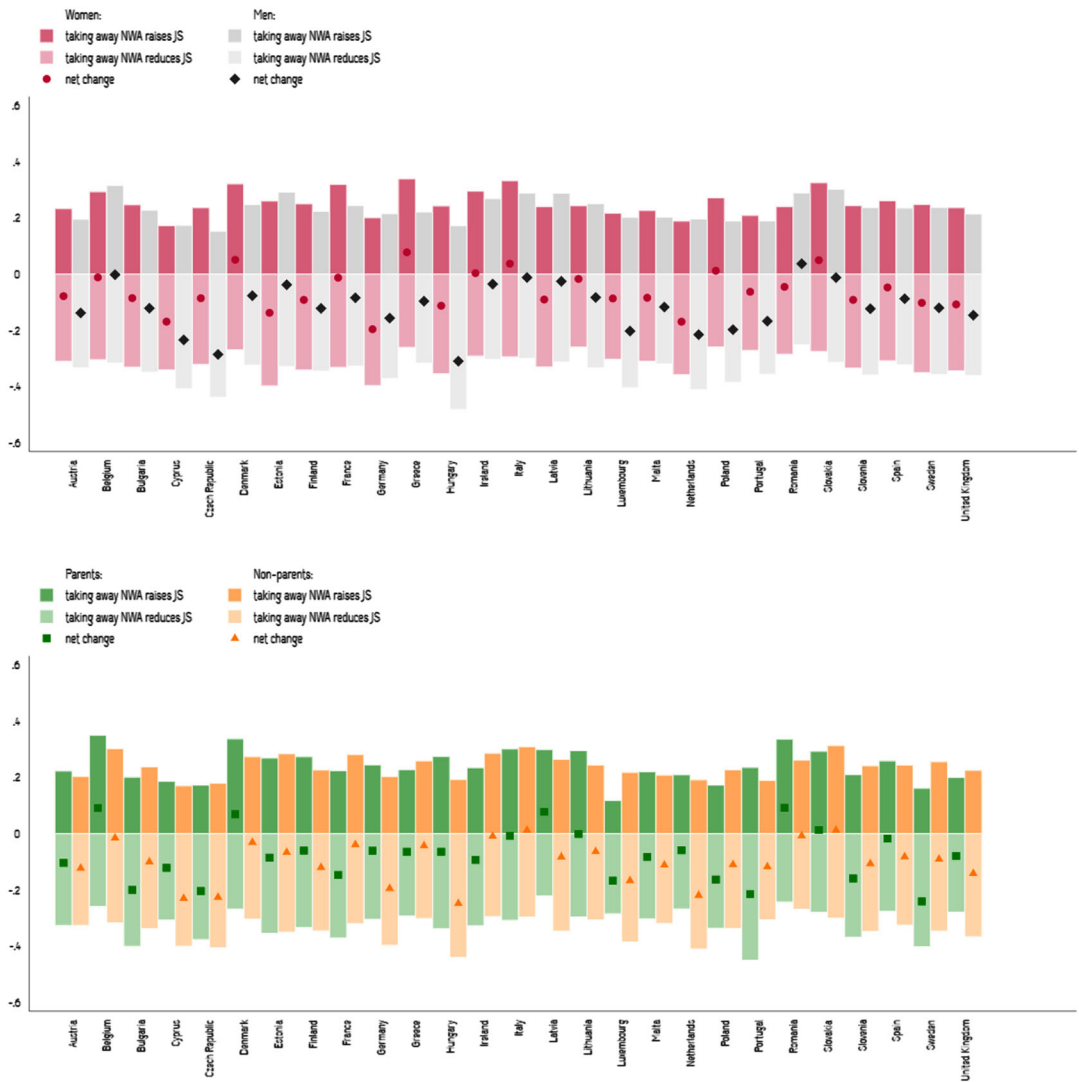
FIGURE 4   Decomposing the changes in job satisfaction if NWAs are eliminated.
[Color figure can be viewed at wileyonlinelibrary.com]
Notes: Taking away NWA refers to a counterfactual change in job satisfaction where a person is actually in a job with NWA and is assumed to change job features to fully regular working conditions. Shares of mismatched and matched individuals obtained with population weights.

standard arrangements. Conversely, the negative bars show matched workers (those whose job satisfaction would decline if NWAs were replaced by standard arrangements). The values on the vertical axis signify the shares of NWAs workers. For example, in Austria matched women outweigh mismatched women by roughly 8 percentage points, the relevant figure for men is close to 18 percentage points.

Figure 4 displays considerable heterogeneity across European countries, though in a majority of them we observed negative net for both men and women. Indeed, the split by genders reveals that there are few cases where the positive bars outweigh the negative ones (the net of removing NWAs is positive). The situation is more ambiguous when we look at aggregates by parents and non-parents. There appear to be highly polar cases among parents. While these opposites may reflect country-specificity, they may also be related to a smaller sample size for parents. Overall, Figure 4 reveals that, for each country, matches outweigh mismatched NWAs workers in a sense that a higher share

of workers would experience a reduction in job satisfaction if NWAs were removed than would gain from such policy change. Our method cannot help to judge whether some employees in standard working arrangements would benefit from access to NWAs, thus we cannot directly evaluate the gains from reallocation of workers between NWAs and standard arrangements. However, while we cannot estimate the share of workers deprived of NWAs, our method is sufficient to grasp the maximum share of workers inadequately matched to NWAs.

Our results strongly suggest that most workers in NWAs were able to individually manage the boundaries between these two spheres and their job satisfaction would not be improved if they no longer had to actively engage in setting boundaries. At the same time, both the share of indifferent NWA workers and the shares of matched and mismatched NWA workers appear to be highly heterogeneous across countries. This heterogeneity defies simple characterizations, as it does not seem to be consistent with the groupings of the European countries according to welfare state or indices based on prevalence of fixed-term employment, share of self-employment, or other factors.

Clearly, gender and parenting status are not the only variables affecting ability for boundary management; there can be other, direct factors (Mellner et al., 2014). For instance, the usage of multiple devices (separate phones or computers for work and private lives) is a way of creating boundaries between home and work (Fleck et al., 2015) and thus may facilitate managing boundaries. Obviously, some forms of employment (e.g., self-employment and home-based work) require better abilities to manage boundaries (Myrie & Daly, 2009). Unfortunately, no such variables are available in EWCS.

Discussion

Our results show that women are substantially less likely to benefit from eliminating NWAs, which is consistent with earlier research by Hamplová (2019). This strong gender gradient appears despite the observation that across all countries, all models, and all data subsamples, the majority of individuals would experience no change in job satisfaction subsequent to the elimination of NWAs. Parenting is also relevant: fathers have a stronger decline in job satisfaction from eliminating NWAs relative to non-fathers. We find mixed results for mothers: typically they appear similar to fathers, but for some NWAs they could benefit if NWAs were replaced by regular working arrangements relative to fathers, but not-relative to non-mothers. These results extend earlier work by Bainbridge and Townsend (2020) to the European context.

A potential concern related to our results stems from working with cross-sectional data. Ideally, one would study longitudinal data and measure changes in job satisfaction for individual workers as their work arrangements change between non-standard and standard, or as they change their parental status. With EWCS such analysis is not feasible, but with other data such stepwise analysis could reveal deeper and more refined policy implications. In principle, our method can be applied the same way to individual level data from one specific country. We have experimented with German SOEP data (analyzed by Zapf & Weber, 2017, for instance), but the questions related to working arrangement were only asked once every few years, which reduces the suitability of this database for our analysis.

Another source of concern might be that we treat the counterfactual levels of job satisfaction as if they were deterministic, but truly they are stochastic, i.e., our model predicts job satisfaction in the scenario when non-standard work is eliminated, but this prediction should be associated with certain probability or a confidence interval around the predicted value. As long as it does not matter on the individual level, this uncertainty starts to play a role when results are averaged (like in a regression) or aggregated (in country levels matched/mismatched groups). As a result, the statistical power of tests performed on logit/ordered logit and aggregated estimates might be lower than presented. A possible way around the problem would be to recover a measure of uncertainty from the ML algorithm (in line with recovering regression type estimates, applying techniques described by Molnar, 2022) and use it to adjust standard errors in later steps. We leave it for future research.

Due to data limitations, our analysis omits wages. Clearly, the positive impact of salaries on job satisfaction is well documented in the literature, starting from Borjas (1979), followed by, e.g., Clark and Oswald (1996), Clark et al. (2008), and in more general context of subjective well-being by Easterlin (e.g., 1995, 2001). Although studies have found that salary is an important determinant of happiness, it could be that job satisfaction is driven not only by own wages, but by wage relative to peers (especially at the same workplace), as indicated by Card et al. (2012). Likewise, it could be that individuals with NWAs are compensated with a wage somewhat higher than peers in standard arrangements. This would be an indirect channel of relative wages influencing job satisfaction, where NWAs appear as a context rather than a mediator. While we cannot exclude this possibility, our specifications adjust for a number of individual characteristics relevant for wages (age, education) as well as job and employer-specific indicators (including industry and occupation, as well as hours worked). These controls capture the systematic variation in wages (and its positive effect on job satisfaction), though they fail to account for any residual variation. More importantly, the omission of this variable would produce lower counterfactuals across all groups. This could affect our second stage estimates only if the rewards for women and parents for working flexibly were larger than for other groups. While these controls cannot fully capture variation in wages, they do capture the systematic component of wage dispersion.

Another variable of interest is the intent behind offering NWAs. Altruistic employers could offer NWAs as a support instrument that helps combining private and professional lives. Both intent and ability to manage boundaries are unobservable. In principle, they could confound one another, biasing our results. For example, systematic cross-country differences in intent could partially explain cross-country differences in the matching of NWAs to individuals. Two arguments are in order, however. First, for the intent to bias our identification of matching, it would have to hold that women and parents are offered NWAs with systematically more supportive intent than other individuals, on average. Second, the intent of the employer may be irrelevant if the worker has limited ability to manage boundaries. For example, a desire to reciprocate the "gift" of flexible arrangements encourages some workers to work more (Chung, 2022), which hinders their ability to effectively manage the mental burdens of private and professional lives, effectively reducing job satisfaction.

Finally, our results would benefit from a richer measure of job satisfaction. In EWCS, the categorical job satisfaction indicator is only weakly correlated with a composite index measurement, as portrayed in Appendix C2. Indeed, the vast majority of people report being satisfied with their job *despite* negative answers to the composite marker questions. Refined measurements of job satisfaction could permit a more complex machine learning classification than what is feasible with current EWCS data.

Our measure of job mismatch builds on a difference between the reported and counterfactual job satisfaction measures. Our measure, the change in job satisfaction, is indicative of the underlying boundary management ability, not an exact measure. We infer that this difference is informative of abilities to manage boundaries. In 2015, EWCS incorporated a more direct measure of this ability in the form of questions on family–work conflict. These questions are inspired by the works of Netemeyer et al. (1996) and Hayman (2005).[14] Appendix Table C3 reveals that among those workers for whom the elimination of NWAs would be beneficial, the proportion experiencing family–work and work–family conflict most of the time is higher than among those workers who are matched. Moreover, the association is stronger in the case of transgressions from work to personal life, than in transgressions in the opposite direction. These results are along our initial expectations, as flexibility enactment theory emphasizes work concerns permeating into family sphere.

Our results serve to substantiate the flexibility enactment theory. It appears that individuals employed in non-standard working arrangements have the ability to manage boundaries between work and private life and thus they do not experience dissatisfaction from them. Eliminating NWAs would not contribute to raising their job satisfaction. The policy debate about NWAs ought to account for

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[14] EWCS includes fewer items, and the specific formulations differ from the measures validated in previous empirical literature.

individual abilities, as one-size-fits-all regulations are likely to leave many workers with lower job satisfaction levels. Overall, formulating policy for adequate workers' rights protection becomes a subtle challenge under flexibility enactment theory.

Our study offers several innovations relative to other strands of the existing literature. First, rather than hypothesizing about the type of workers and the types of occupations that may be more challenged by boundary management, we focus on identifying the *gradient* of job satisfaction across individuals. This gradient reflects a hypothesis long salient in the literature, that a given person may derive different levels of job satisfaction if some specific features of this job are altered. The idea of gradient builds on the earlier conceptualization of the self-discrepancy theory and social identity theory; as suggested by Westman and Piotrkowski (1999), for some individuals irregularity is a natural habitat, whereas for the others it triggers negative spillovers and transgressions, necessitating the burdensome development of a boundary management strategy.

Second, we make no *ex ante* assumptions about the drivers of the gradient. We employ machine learning rather than parametric modelling. This methodology allows us to avoid many discretionary choices. Foremost, we do not impose any restrictions on the functional form of the model nor on the statistical distribution of the data. Neither the definition of variables nor their interrelationships have to be pre-specified in a model that relies solely on classification. Moreover, given that job satisfaction is typically a categorical variable, we do not need to assume anything about the thresholds for assigning the parametric predictions to the categories: the machine learning algorithm automatically assign the level of job satisfaction to each individual.

Third, we explore data from the representative cross-country survey, thus permitting the identification of the gradient and the mismatch along all occupational groups and industries. This helps to mitigate the risks of omitting large groups of workers mismatched in their working arrangements.

CONCLUSIONS

In this paper, we build on flexibility enactment theory. We leverage this approach to answer novel research questions about the prevalence of mismatches between actual and optimal working arrangements. Our approach helps to reconcile two superficially opposite views in the policy debate. The first view emphasizes that flexibility at work is what helps workers reach their potential. The second view emphasizes that work tends to transgress into private life and that this transgression is easier when working arrangements leave room for abuse. Flexibility enactment theory posits that some workers are immune to such abuse, because they are able to actively manage boundaries and separate work from private life. This theory builds on role theory and social identity theory as well as spillover theory and boundary theory. From these theories jointly, we conjecture that the ability to actively manage boundaries is not merely a skill, but it actually enables deriving satisfaction from a job even if it is characterized by non-standard working arrangements.

We test implications from flexibility enactment theory using data from the European Working Conditions Survey. We deploy modern machine learning methods to uncover (potentially complex and nonlinear) relationships between individual characteristics, family characteristics, job features and job satisfaction, separately for individuals working in standard employment arrangements and in non-standard employment arrangements. The machine learning models are then used to obtain counterfactual levels of job satisfaction for workers with NWAs, as if they worked in standard arrangements. These counterfactual simulations enable the identification of who would benefit from a change in working arrangements, who would lose, and who is indifferent between the two arrangements. We characterize the extent and drivers of mismatch among 27 European countries.

Our results have important policy implications. Given substantial heterogeneity across countries as well as the systematic character of mismatches across individuals, no one-size-fits-all policy is likely to be successful in raising the job satisfaction of all workers. Neither the curtailment nor the widespread introduction of NWAs will universally improve worker welfare. If anything, the only potentially

universal policy recommendation would be raising the boundary management skills (e.g., by introducing them to educational curricula). Otherwise, individuals are highly heterogeneous in terms of suitable working arrangements. Furthermore, the workers' inclination to engage in non-standard arrangements depends on personal circumstances and may change over the life cycle.

Our results call for further theorizing on the links between job satisfactions and working conditions. While the flexibility enactment theory appears to find strong confirmation in the data, there seem to be several particularly promising areas for wider exploration. First, it appears that the notion of social identity may be more directly intertwined with flexibility enactment. Specifically, identity may be an important pillar of boundary management strategy (e.g., cultural norms around work ethics). While it was demonstrated that managing spillovers may be viewed as a distinguishing characteristic of some groups, it is not warranted that the extent of satisfaction derived from this ability is automatically related to the ability itself; feeling competent to manage some situations is not automatically equivalent to appreciating the situations themselves. Second, it appears that the existing theories expect non-standard working arrangements to facilitate transgressions from work to private lives (hence the need to manage the spillovers). There exists a large literature on transgressions in occupations with long hours (e.g., medical professions and the police force; see Atkinson et al., 2011; Bohle & Tilley, 1989; Hertz & Charlton, 1989; Torquati et al., 2019). To some individuals, however, there may be intrinsic value in the arrangements associated with their occupations, often non-standard ones (e.g., actors, musicians, television and radio producers). A better understanding of the intrinsic value of non-standard arrangements through the lens of flexibility enactment theory could help us refine the meaning of the term "transgression" and thus the mechanisms tying them to job (and life) satisfaction.

Last, but certainly not least, the gender context of the flexibility enactment theory should be revisited. Our results show that women are much less likely to benefit from eliminating NWAs, but we find little support that this effect is driven by parenting. Indeed, for most types of mismatches, parents of both genders are equally likely to benefit from a change in arrangements. Given these findings, one cannot explain away the persistent and large gender differences in mismatches with the burdens of childbearing and rearing. These large gender differences call for thorough exploration into social identity theory and boundary theory.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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