Faculty time allocation in relation to work-family balance, job satisfaction, commitment, and turnover intentions

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A B S T R A C T

One common challenge for faculty is decisions regarding the allocation of time across research, teaching, and service tasks. We investigate faculty time allocation among typical faculty members using latent profile analysis. We examine associations between profile membership and gender and time spent in housework, childcare, and eldercare. We also use competing theories (job enrichment, the effort-reward imbalance model) to investigate profile associations with work-family balance, job satisfaction, affective commitment, and turnover intentions. Four profiles emerge: research focus, teaching focus, a "classic" dual research and teaching focus, and dual teaching and service focus. Women are more likely to be members of the teaching profile compared to the research profile, and the research profile is associated with the fewest housework hours. Classic profile members have the highest work-family balance and job satisfaction, whereas members of the teaching profile are the lowest on each correlate. Results suggest a balance of rewarding and enriching demands yields the most positive outcomes.

1. Introduction

Faculty are essential and dedicated public servants who educate and enrich society (Shaker & Plater, 2016). Faculty improve society through discretionary and substantial time and effort dedicated to research, teaching, and service (Misra, Lundquist, & Templer, 2012). Tenure-track faculty evaluations are based on these three performance domains, and evaluations are used for tenure, promotion, and merit raise decisions. Further, discretionary time decisions have the potential to impact employees' subjective work experiences and ultimately the quality and tenure of work (e.g., Humphrey, Nahrgang, & Morgeson, 2007). Tenure-track faculty time allocation therefore has considerable implications for career success, and ultimately downstream educational and economic societal thriving (Shaker & Plater, 2016).

Faculty time allocation decisions also exist within a family context. Often the pre-tenure period co-occurs during the early family stage period, which can include marriage and young children (Jacobs & Winslow, 2004). Time allocation decisions at work are therefore likely made in light of family time obligations. This balancing act between work and family is often identified as a factor

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that deters women's success as professors in higher education (Goulden, Mason, & Frasch, 2011; Misra et al., 2012).

Although researchers have examined faculty time allocation (e.g., Dahm, Glomb, Manchester, & Leroy, 2015; Jacobs & Winslow, 2004; Misra et al., 2012; Winslow, 2010), time allocation domains are often examined in isolation using variable-centered statistical approaches such as regression that do not capture how work responsibilities are combined with one another (Misra et al., 2012). Further, historical emphasis has been placed on demographic predictors of time allocation (e.g., gender, parental status, tenure status; e.g., Jacobs & Winslow, 2004; Misra et al., 2012; Winslow, 2010), with little consideration of how family time may shape time allocation decisions. Finally the extent that time allocation decisions are associated with job-related cognitions, namely work-family balance, job satisfaction, organizational commitment, and turnover intentions remains under-explored. Such outcomes are particularly important, in that they are known predictors of career success and turnover (Griffeth, Hom, & Gaertner, 2000; Ng & Feldman, 2014).

The purpose of the current study is to examine time allocation latent profiles among tenured and tenure-earning faculty members. Our investigation focuses on faculty members that dedicate a typical number of total work hours (approximately 50–60 h on average; e.g., Misra et al., 2012; Watanabe & Falci, 2016), in order to identify time allocation strategies used by prototypical tenure-track faculty across a variety of institutions. Using time scarcity (Becker, 1965; Edwards & Rothbard, 2000) and competing motivational theories (Hackman & Oldham, 1975; Siegrist, 1996), we test relationships between time allocation latent profiles and gender and family-related hours (housework hours, childcare hours, and eldercare hours) in addition to work-family balance, job satisfaction, affective commitment, and turnover intentions.

Our study makes several contributions to time allocation research within and beyond faculty samples (e.g., Misra et al., 2012; Winslow, 2010). When studying time allocation, vocational research has traditionally focused on time across multiple domains (e.g., work and family time). However, workers' work and family experiences are ostensibly just as heavily shaped by how they allocate time *within* the work domain. For example, time spent on tedious and draining tasks might degrade a worker's motivation and satisfaction, potentially spilling over to the home domain and decreasing feelings of work-family balance. Workers that are able to maximize an array of meaningful or rewarding tasks may feel relatively more effective at their jobs and also feel more balanced between work and home. The present manuscript draws explicit attention to this rarely considered phenomenon of intrarole time allocation, and examines theoretically derived correlates of time allocation strategies. Faculty members are an ideal sample for investigation of these ideas due to the profession's distinct and generalizable time allocation domains, namely time allocated to research, teaching, and service.

We also focus on time allocation *profiles*, which allow us to examine how individuals distribute time across multiple work domains in conjunction with one another. For example, it may be that two faculty members have equivalent hours dedicated to research, but one engages in more service and teaching than the other. Moreover, the inductive nature of our person-centered approach allows for the discovery of new profiles (Wang & Hanges, 2011). Although we have theory-driven ideas about the types of profiles that will emerge, we are able to detect additional subpopulations that might be masked using deductive methods. One previous study uses a cluster analysis approach to examine time allocation profiles among a broad sample of academics (BrckaLorenz, Nelson Laird, Yuhas, Strickland, & Fassett, 2018). We extend this work by using a latent profile approach, which uses more formal, consistent criteria for allocating individuals to clusters and accounts for uncertainty in class membership (Wang & Hanges, 2011). Further, our analysis is conducted on an exclusively tenure-line sample, allowing us to speak to profiles that arise within typical tenure track faculty rather than clusters that characterize the broader range of positions in academia (e.g., administration, lecturers). Our test of theoretically-relevant correlates (gender and family hours) also addresses the extent that previous research findings on gender and family responsibilities hold when examining time allocation profiles. Finally, our study explores job-related cognitions that have clear implications for career success and turnover, particularly for women (Goulden et al., 2011; Griffeth et al., 2000; Hom, Lee, Shaw, & Hau�knecht, 2017). Time allocation is discussed as an important determinant of job-relevant perceptions, attitudes, and intentions (e.g., Dahm et al., 2015). Yet the scant research on intrarole work time allocation has focused on predictors rather than on outcomes. We test the relationship between time allocation profiles and job-related cognitions by pitting job characteristics (Hackman & Oldham, 1975) and effort-reward imbalance (Siegrist, 1996) theories against one another. We thus contribute grounded theoretical rationale, which can be used to guide future research examining outcomes associated with time allocation both within and beyond the academic context.

2. Background and hypotheses

2.1. Faculty time allocation profiles

Tenure-track faculty members distribute their work hours across three domains: research, teaching, and service (Jacobs & Winslow, 2004; Misra et al., 2012; Winslow, 2010). Research hours are defined as time spent in activities related to research or similar creative endeavors within one's discipline (e.g., reading, writing, meeting with assistants or collaborators). Teaching hours are time spent in activities related to course teaching/preparation or student mentorship (e.g., teaching preparation, grading, office hours, reading and commenting on student papers). Service hours are time spent on university or professional service endeavors (e.g., attending meetings, organizing or participating in workshops, reviewing for journals).

Several studies have examined the question of how faculty allocate their time across different work domains. On average, studies conducted within the United States find faculty spend approximately 50–60 h per week on work-related tasks (Jacobs & Winslow, 2004; Misra et al., 2012), although estimates in other countries are somewhat lower, at 45–50 h per week (Bentley & Kyvik, 2012). Within these hours, faculty spent the majority of their time on research and teaching requirements, and relatively less time on service

(e.g., BrckaLorenz et al., 2018; Link, Swann, & Bozeman, 2008; Misra et al., 2012; Toutkoushian & Bellas, 1999). Time allocation averages typically reflected a prioritization of either research or teaching, such that individuals spent on average 5–10 h more time each week on research or teaching responsibilities relative to the alternative domains (e.g., Jacobs & Winslow, 2004; Misra et al., 2012). Time allocation patterns with relatively high service hours also consistently characterized tenured faculty (e.g., BrckaLorenz et al., 2018; Link et al., 2008). One study to-date has examined profiles of faculty time allocation based on cluster analysis (BrckaLorenz et al., 2018). Using a large-scale multi-institution study including tenure track, administrative, and non-tenure track faculty, the researchers identified and named five profiles, including "research-heavy" (21.0 h research, 14.1 h teaching, 7.7 h service), "teaching-heavy" (4.2 h research, 29.1 h teaching, 5.3 h service), and "service-heavy" profiles (8.6 h research, 16.0 h teaching, 27.8 h service), as well as "classic" profile (16.2 h research, 28.2 h teaching, 9.1 h service), and a "moderate load" profile (5.5 h research, 14.0 h teaching, 5.5 h service). We expect relatively fewer profiles than those found by BrckaLorenz et al. (2018) due to our more homogeneous sample of tenure-track faculty. Previous research on tenure track faculty generally finds that average teaching and research time outweighs average time spent on service (e.g., Dahm et al., 2015; Jacobs & Winslow, 2004; Link et al., 2008). Based on the combination of previous findings, we also deductively hypothesize there are at least two plausible time allocation profiles (research and teaching) that will emerge within our data. We also inductively explore additional emergent profiles that may be masked by variable centered-approaches.

Hypothesis 1. The following two profiles of faculty time allocation exist within our sample: a teaching class (more hours are spent teaching compared to research or service), and a research class (more hours are spent researching compared to teaching or service).

2.2. Gender and family correlates

Estimates of time spent within each of these domains varies by a number of factors, including gender, tenure status, institution type, and racial status (Jacobs & Winslow, 2004; Link et al., 2008; Milem, Berger, & Dey, 2000; Misra et al., 2012). In the current study we focus on two such factors that are directly relevant to career success in higher education, particularly for women: gender and number of hours dedicated to family responsibilities (housework hours, childcare hours, and eldercare hours).

Research has consistently found gender differences in time allocation for faculty such that women spend more time on teaching and service activities and less time on research compared to men (Link et al., 2008; Misra et al., 2012; Toutkoushian & Bellas, 1999). This is thought to occur due to gendered norms or preferences (Link et al., 2008; Misra et al., 2012). For example, Dahm et al. (2015) found women were more prosocial and found a greater sense of closure completing service requests when compared with men. It could also be that students are more comfortable approaching women for mentoring, because women tend to be perceived as more agreeable and communal than men (e.g., Eagly & Wood, 2011; Feingold, 1994). Studies also indicate time allocation is gendered due to pressure, such that women spend more time than preferred on service, feel more obligated to take on service and teaching responsibilities, and find it more difficult to say no compared to their male colleagues (Dahm et al., 2015; Misra et al., 2012). We expect similar findings in our data, such that women will be more likely to engage in time allocation profiles with higher service and/ or teaching responsibilities, compared to men.

Hypothesis 2. Gender is associated with time allocation profile membership, such that women are more likely to have profiles characterized by high teaching hours and/or high service hours compared to men.

From a time scarcity perspective (e.g., Becker, 1965; Edwards & Rothbard, 2000), there are limited hours in each day to complete both work and household tasks. When individuals commit time and energy resources towards housework and caregiving, there are fewer resources available for work demands (Edwards & Rothbard, 2000). When investigating the relationship between home demands and time allocation among faculty, previous research typically uses proxies such as marital or parental status (e.g., Jacobs & Winslow, Misra et al., 2012; Singell, Lillydahl, & Singell, 1996; Toutkoushian & Bellas, 1999). Findings showed little consistent evidence for direct associations between marital or parental status and time allocation. Rather, the effects of parental status on time allocation may be different for men and women. For partnered women, dependent caregiver status is negatively associated with research time whereas for partnered men, dependent caregiver status is positively (Jacobs & Winslow, 2004; Winslow, 2010) or not associated (Misra et al., 2012) with research time. Gender differences in the relationship between parental status and faculty time allocation are thought to be due to the increased amount of time and energy dedicated to housework and childcare for women faculty compared to men (Jacobs & Winslow, 2004;Misra et al., 2012; Winslow, 2010). Thus, previous research using parental status as a demographic proxy suggests that faculty who spend more hours on home tasks will have fewer hours dedicated towards research tasks.

In contrast to research time, teaching and service time seem to be unaffected by parental status (Misra et al., 2012; Winslow, 2010). This is attributed to socially and institutionally imposed pressures and deadlines for service and teaching tasks, whereas day-to-day research pressures and deadlines are typically self-imposed (Dahm et al., 2015; Misra et al., 2012). Additionally, work by Dahm et al. (2015) finds research tasks require relatively more self-regulatory resources compared to teaching and service. Consequently, it may difficult to engage in research tasks if faculty feel depleted from housework and caregiving responsibilities.

Our research extends this line of work by directly testing the relationship between time allocation profiles and housework, childcare, and elder care hours, rather than using demographic variables as proxies for time demands in the home. Consistent with the theoretical perspective of time scarcity and empirical research that suggests research time is most consistently associated with parental status, we hypothesize that individuals who in high research hour profiles perform fewer housework and caregiving hours relative to those in other profiles.

Hypothesis 3. Housework hours, childcare hours, and eldercare hours are associated with time allocation profile membership, such that profiles characterized by high research hours are associated with fewer housework hours, childcare hours, and eldercare hours compared to other profiles.

2.3. Job-related cognitions

Although a fair amount of research has been dedicated to predictors of intrarole faculty time allocation, relationships with job-related cognitions (i.e., subjective perceptions, attitudes, or intentions regarding one's job), are less understood. We specifically focus on four job-related cognitions that have clear implications for career success and turnover: work-family balance, job satisfaction, organizational commitment, and turnover intentions. Two studies have examined job-related cognitions in relation to faculty time allocation within research-intensive universities. Bozeman and Gaughan (2011) found no relationship between hours on research or grant proposals and job satisfaction, while hours teaching undergraduates was negatively associated with job satisfaction. Service hours were not examined. Dahm et al. (2015) found research hours were positively associated with work satisfaction and well-being while negative associations were found for teaching hours. Service hours were not significantly associated with work satisfaction or well-being. We expand this work by examining a wider array of job-related cognitions, which span both work and non-work domains. Our use of multiple indicators replicates and expands previous findings regarding job satisfaction and well-being. In addition, these indicators are known correlates of turnover (Griffeth et al., 2000; Hom et al., 2017) and have been posited as rationale for faculty withdrawal (Goulden et al., 2011; Jacobs & Winslow, 2004). Additionally, we explore two plausible theoretical frameworks that may explain why time allocation profiles are associated with job-related cognitions: job characteristics theory and effort-reward imbalance. Both theories focus on psychological rewards gained from work tasks, but yield different predictions regarding which domains may be most beneficial. By exploring both, we begin to establish a stronger theoretical backbone to organize previous findings and move forward in predicting why time allocation decisions are associated with job-related cognitions and career outcomes.

Job characteristics theory defines five specific core job features that enrich the workers' job experience: skill variety (the use of many diverse skills), task identity (completion of a whole, identifiable piece of work), task significance (conducting meaningful or important work), autonomy (control over the work process), and feedback (information about performance effectiveness) (Hackman & Oldham, 1975). Skill variety, task identity, and task significance are thought to engender feelings of meaningfulness and value, while autonomy facilitates a sense of responsibility, and feedback facilitates knowledge about the job. These positive psychological resources (meaningfulness, responsibility, and job knowledge) in turn motivate individuals, increase dedication to and perceptions of the job, and provide positive psychological fodder that can increase efficacy and satisfaction in both work and family domains. Other theoretical perspectives (e.g., Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Karasek, 1979) similarly propose enriching job characteristics are psychological resources, which increase motivation and improve attitudes and wellbeing within and beyond work.

Meta-analytic research has confirmed enriching jobs characterized by skill variety, task identity, task significance, autonomy, and feedback are associated with well-being and job attitudes, such as increased job satisfaction, and reduced burnout and turnover intentions (Humphrey et al., 2007). Far less empirical research has been conducted on core job characteristics and work-family balance, although studies find job autonomy and job complexity (akin to skill variety) are positively associated with work-family balance (e.g., Keene & Quadagno, 2004; Valcour, 2007).

Although these job characteristics have not been directly associated with research, teaching, and service tasks, evidence suggests teaching may be most enriching. Dahm and colleagues found that faculty rated teaching as providing the most closure (task identity), the least delayed gratification (feedback), and as the most prosocial (task significance). Further, teaching arguably provides regular social interaction, which facilitates opportunities for immediate feedback. Such opportunities may be few and far between for research tasks, as several components are solely conducted, and feedback cycles are typically weeks to months long. Consequently, teaching may be a primary source of meaning, responsibility, and knowledge, which facilitates positive job attitudes moreso than research or teaching responsibilities. In sum, we hypothesize that because teaching is theoretically most enriching, profiles characterized by high teaching hours are associated with greater work-family balance, job satisfaction, and affective commitment and lower turnover intentions, compared to profiles characterized by high research hours.

Competing Hypothesis 4. Time allocation profiles with high teaching hours have higher (a) work-family balance, (b) job satisfaction, (c) affective commitment, and lower (d) turnover intentions compared to time allocation profiles with high research hours.

On the other hand, time allocation might be viewed from an effort-reward imbalance perspective (Siegrist, 1996). The effort-reward imbalance model suggests there is a social exchange relationship between employees and their employers. Employers provide rewards that can fulfill emotional and motivational needs, such as money, esteem, or status. In return, employees contribute effort to meet the organization's demands and expectations. When employees perceive they are receiving rewards and that those rewards are equitable to the effort put into work, they feel valued, recognized, and successful (Siegrist, 1996), generating feelings of satisfaction, fulfillment, and psychological health within and beyond work (e.g., De Jonge, Bosma, Peter, & Siegrist, 2000). However, an imbalance characterized by high effort and low reward creates a demoralizing work context, resulting in negative job perceptions and attitudes (De Jonge et al., 2000; Van Vegchel, De Jonge, Bosma, & Schaufeli, 2005).

Research is widely recognized and empirically supported as the faculty time domain that is most consistently linked with rewards, such as salary, tenure attainment, and professional status across universities (Dahm et al., 2015; Fairweather, 1993; Toutkoushian &

Bellas, 1999). Even within teaching-oriented institutions, faculty are increasingly research productive, in an effort to generate funds and emulate the professional status awarded to their colleagues in research universities (Dey, Milem, & Berger, 1997; Fairweather, 1993; Milem et al., 2000; O'Meara & Bloomgarden, 2011). This is contrasted with teaching, which is regarded as a relatively less prestigious job task (Bozeman & Gaughan, 2011). Thus, according to the effort-reward imbalance model, faculty that use time allocation strategies that favor research in lieu of teaching should have more positive job-related cognitions, because they perceive a greater balance between their efforts (i.e., time spent meeting university demands) and the rewards gained from those efforts (i.e., recognition, prestige, potential for promotion) within institution and in the larger academic community.

In support, previous research has found research time is positively associated with salary, as well as work satisfaction and well-being. In contrast, teaching time is negatively associated with salary, work satisfaction, and physical well-being (Bozeman & Gaughan, 2011; Dahm et al., 2015). We hypothesize that because research is most externally validated and rewarded by professional peers and administration, profiles characterized by high research hours are associated with greater work-family balance, job satisfaction, and affective commitment and lower turnover intentions, compared to profiles characterized by high teaching hours.

Competing Hypothesis 5. Time allocation profiles with high research hours have higher (a) work-family balance, (b) job satisfaction, (c) affective commitment, and lower (d) turnover intentions compared to time allocation profiles with high teaching hours.

3. Method

3.1. Participants

Data were collected from faculty members across 11 universities within a U.S. southeastern state (N = 1270). Our sampling is intended to generalize to non-administrative tenure-track faculty with typical research, teaching, and service responsibilities. Because latent profile analysis identifies subpopulations, we wanted to ensure our profiles described different time allocation strategies that might be used by the prototypical tenure-track faculty member, rather than identifying profiles that would characterize expected time allocation differences across qualitatively different faculty positions (e.g., lecturer vs. tenure-track vs. administrators). We also aimed to capture a variety of types of institutions and disciplines in order to increase the generalizability of our findings. Our broad sampling also allowed us to explore differences in profiles across individual, institutional, and discipline features (see supplemental analyses). We aimed to have a sample size of at least five hundred participants in order to accurately detect time allocation profiles (Nylund, Asparouhov, & Muthén, 2007).

We excluded individuals who did not identify as tenure-track or tenured assistant, associate, or full professors (N = 314), who self-identified as administrative or were missing time allocation data (N = 209), and who reported > 60 h per week in research or teaching, > 30 h per week in mentoring or university service, > 25 h per week in professional service, or > 90 h per week total (N = 198). Time allocation cutoffs were chosen after reviewing 1) discontinuous extreme values in our frequency distributions, 2) values that fell above the 95% confidence interval of reported hours in each time allocation domain, and 3) a holistic understanding of typical work hours within and beyond academia as well as findings in previous faculty time allocation research. Final cutoffs reflected values the research team considered a plausible number of total and individual domain working hours. In all cases except total work hours, cutoffs were at or above the sample 95% confidence interval. Exclusion criteria were used to ensure a relatively homogenous sample of typical tenure-track faculty by removing faculty members that are qualitatively different in terms of time commitment to work than typical faculty members. In addition, the criteria removed extreme time allocation outliers. Each of these issues (qualitatively distinct subpopulations and outliers) have the potential to heavily drive emergent profiles and undermine the potential for latent profile analysis to yield meaningful profiles that characterize typical faculty time allocation.[1]

The final sample consisted of 549 faculty members across 11 public universities. Participants were on average 48.62 years old (SD = 11.60), were 58.83% male, and predominately Caucasian (83.39%). One participant reported "other" for gender; this participant was excluded for gender analyses. Participants worked in a variety of disciplines, (e.g. Arts & Sciences = 41.68%; Agricultural & Life/Food Sciences = 9.22%; Education = 7.21%, Engineering = 7.01%), 56.45% of which were classified as STEM fields. Faculty reported 62.53 working hours on average (SD = 13.72 h) per week. Participants had a mean tenure at their university of 12.74 years (SD = 9.99 years), and 66.14% were tenured. A majority of participants were married or in a committed relationship (84.31%). Of the participants with children (N = 242), the mean number of children under the age 18 that lived at home was 1.34 (SD = 0.96).

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[1] We used independent samples t-tests to compare gender, nonwork hours, job attitudes, and work-family balance for the removed sample of extreme high work hour faculty removed from our main sample versus the typical faculty retained for analysis. Significant differences might indicate potential bias in our main sample. Additionally, we might expect theoretically meaningful differences, such that extreme responders are more likely to be male, have systematically fewer family obligations (i.e., fewer housework, childcare, and eldercare hours), and poorer attitudinal and perceptual correlates (i.e., lower work-family balance, job satisfaction, affective commitment, and higher turnover intention) compared to the main sample due to extreme working hours. The extreme responders had significantly greater household hours (t(316.53) = −2.10, p = .04) and fewer childcare hours than the main sample (t(519.09) = 4.62, p < .01). All other group differences were non-significant (p > .26). Overall, our analyses show little evidence that extreme responders are systematically different from the main sample on our correlates of interest.

3.2. Procedure

Data were collected as part of a project focused on faculty careers. Faculty members across 11 universities located in a south-eastern state within the U.S. were invited to participate via generalized invitation emails sent from University administrators (recruitment pool size is unknown) and via individualized emails sent from the research team. Interested participants completed an online survey containing all study measures. A single-time point survey was thought appropriate given that our focus was not in causal prediction, nor change across time.

3.3. Measures

All measures are self-report gender, time, or Likert-type items. All measures have been commonly used in previous research and established as construct-valid indicators of their respective constructs in the organizational sciences and careers literature with sufficient internal consistency reliability estimates ($\alpha > 0.70$, e.g., Bowling & Hammond, 2008; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Misra et al., 2012; Greenhaus, Ziegert, & Allen, 2012).

3.3.1. Gender
Participant gender (men = 1, women = 2, other = 3) was assessed using a single item.

3.3.2. Time allocation
Participants indicated the number of hours spent each week engaged in each of the following: research (e.g., research-related reading, writing, meeting with assistants or collaborators, presenting at conferences), teaching (e.g., teaching undergraduate and graduate courses or independent studies, teaching preparation, grading), mentoring (e.g., assisting with senior theses, reading and commenting on papers, advising), service to university (e.g., serving on committees, attending meetings, service-related emailing, organizing or participating in workshops), service to professional discipline (e.g., reviewer for professional journal, press, or foundation/agency, editor for professional journal, organizing conferences or workshops, clinical work), housework (e.g., shopping, cooking, cleaning, home repairs), childcare (e.g., meeting needs of or spending time with children and teenagers under the age of 18), and eldercare (e.g., providing physical care, emotional support, spending time with and assisting with daily living tasks for adults age 65 and older) (Misra et al., 2012). Examples of tasks for each category were provided to ensure participants consistently categorized tasks. Participants were reminded of the number of hours in a five day work week and on the weekend; if implausible values were provided, participants received an error message and were asked to double-check their responses. A teaching composite was created by summing teaching and mentoring time, and a service composite was created by summing service to university and service to profession time.

3.3.3. Work-family balance
Work-family balance was assessed with five items rated on a scale that ranged from 1, *strongly disagree*, to 5, *strongly agree* (Greenhaus et al., 2012; $\alpha = 0.92$). A sample item included: "I am able to balance the demands of my work and the demands of my family."

3.3.4. Job satisfaction
Job satisfaction was assessed with three items on a scale that ranged from 1, *strongly disagree*, to 5, *strongly agree* (Cammann, Fichman, Jenkins, & Klesh, 1979; $\alpha = 0.94$). A sample item included: "All in all, I am satisfied with my job."

3.3.5. Affective commitment
Affective commitment was assessed with four items on a scale that ranged from 1, *strongly disagree*, to 5, *strongly agree* (Allen & Meyer, 1990; $\alpha = 0.85$). A sample item included: "I am highly committed to the organization."

3.3.6. Turnover intentions
Turnover intentions was assessed with two items similar to those used by Wayne, Butts, Casper, and Allen (2017) on a scale that ranged from 1, *strongly disagree*, to 5, *strongly agree* ($\alpha = 0.90$). A sample item included: "When circumstances permit, I will probably look for a new job."

3.4. Analytic approach

Our rationale and hypotheses are person-centric, meaning that we derive hypotheses based on a constellation of individual features, namely time allocated to research, teaching and service. Our person-centric approach allows us to identify sub-populations of individuals that similarly allocate time, and to compare these subpopulations on our variables of interest. Thus, our findings speak to correlates associated with how individuals allocate time across multiple domains, rather than correlates associated with the amount of time in any one domain (see further discussion in Wang & Hanges, 2011).

Consistent with the person-centric approach, data were analyzed using latent profile analysis (e.g., Nylund et al., 2007; Wang & Hanges, 2011). Latent profile analysis is a type of mixture modeling, which reveals unobserved heterogeneity in a population by identifying groups of people that have similar responses to continuous measured variables (Nylund et al., 2007). Latent profile

analysis is analytically a data-driven approach, in which data are used to determine emergent individual profiles, based on the input variables (in our case, time allocated to research, teaching, and service). The data-driven quality of profiles allows for the emergence of inductive profiles that may be difficult to glean when using the levels-based approach. Consistent with published recommendations, we also hypothesize the presence of some distinct profiles in advance to add theoretical rigor and aid interpretation of the results (Wang & Hanges, 2011).

We first analyzed a single latent profile, which represented average time allocation across the entire sample. We then increased the number of latent profiles by one until the increase in model fit no longer reflected a substantial change. We evaluated model fit using seven statistical indices based on recommendations from the literature (Nylund et al., 2007; Tofighi & Enders, 2007): Akaike information criterion (AIC), Bayesian information criterion (BIC), sample-size adjusted BIC (SSBIC), Lo-Mendell-Rubin likelihood ratio test (LMR), bootstrap likelihood ratio test (BLRT), and entropy. Large entropy values (maximum of one) indicate good fit. All other fit indices are relative, such that smaller (AIC, BIC, SSABIC) or statistically significant values (LMR, BLRT) indicate a better fit for the current model compared to the previous model. We also examined the profiles at each step to evaluate the extent that profiles emerged that matched our a-priori hypothesis. Thus, our final model decision was both inductive (model fit-driven) and deductive (hypothesis-driven), per published recommendations (Wang & Hanges, 2011).

We used the three-step approach to test Hypotheses 1–5 using Mplus Version 7 (Muthén & Muthén, 1998–2010). For step one, latent profiles were created using the three work-related time allocation variables (research, teaching, and service hours) and the final number of best-fitting profiles are retained (Hypothesis 1). For step two, most likely class membership was determined for each individual based on the probability that each individual has of belonging to each profile. For step three, the profiles were regressed on gender and family hour variables (Hypotheses 2, 3, using R3STEP command in Mplus) or work-family balance, job satisfaction, affective commitment, and lower turnover intentions variables were regressed onto the latent profiles (Hypotheses 4, 5, using DCON command in Mplus) while accounting for most likely class membership and classification error rate (Asparouhov & Muthén, 2014). Maximum likelihood estimation with robust standard errors (MLR estimator) was used for all analyses. These commands used listwise deletion. Therefore, while profiles and most correlate analyses were computed using all 549 individuals, the analysis examining work-family balance was conducted using 510 individuals, and the analysis examining gender was conducted using 548 individuals.

4. Results

Descriptive statistics and correlations among study variables are shown in Table 1. Because work-family balance, job satisfaction, organizational commitment, and turnover intentions are conceptually similar (positive evaluations of work and/or life), we conducted a confirmatory factor analysis in R using the lavaan package (Rosseel, 2012). This analysis allowed us to establish psychometric validity and ensure each measure taps into a distinct construct. A CFA in which each item loaded onto its respective construct demonstrated good fit to the data (χ^2(71) = 223.22, p < .01, CFI = 0.97, TLI = 0.96, RMSEA = 0.07, SRMR = 0.05). Loadings were all statistically significant and standardized loadings were all above 0.60. Correlations among the factors were significant, in the expected direction, and highly consistent with correlations shown in Table 1. A chi square difference test showed the fit for the four factor model was significantly better than a solution in which all items loaded onto a single factor (χ^2(77) = 3008.42, p < .01, CFI = 0.46, TLI = 0.36, RMSEA = 0.27, SRMR = 0.23, $\Delta\chi^2$(6) = 2785.20, p < .01).

Hypothesis 1 stated that at least two profiles would emerge, reflecting a focus on research and a focus on teaching. Fit statistics are displayed in Table 2. When examining the five and six profile models, several fit statistics (AIC, BIC, SSBIC) declined at a marginal rate, indicating the four profile model demonstrated incrementally better fit in comparison to the alternative models. LMR also did not significantly improve for the five profile model compared to the four profile model. BLRT estimates were inconclusive, as each model was statistically better than the previous model. Although entropy was relatively better for the three and five profile models, the five profile model had one profile with few participants (3.31% of the sample). Further, all other fit statistics indicated a four profile solution fit the data the best. Based on the majority of our fit statistics, we retained the more parsimonious four profile solution (Table 3). Similar to BrckaLorenz et al. (2018), the majority of participants could be described by a classic profile. Consistent with Hypothesis 1, we also identified a research profile and a teaching profile. The fourth profile reflected a dual focus on teaching and service.

Next, we tested gender and family hours in relation to profile membership (see Table 3). Hypothesis 2 stated women are most likely to allocate time to a combination of teaching and/or service with low research hours compared to men. There was a significant relationship between gender and profile membership, such that women were more likely to be in the teaching profile compared to the research profile (p = .02). However, no other contrasts were statistically significant. Because there was a significant difference between the most teaching-heavy profile and the most research-heavy profile in the hypothesized direction, we conclude Hypothesis 2 was supported. Hypothesis 3 stated that profiles characterized by high research hours are negatively associated with housework, childcare, and eldercare hours. The classic profile and the teaching profile were each associated with greater housework hours than the research profile (p = .04, p = .03, respectively). No other contrasts were significant for housework, childcare, or eldercare hours. We conclude partial support for Hypothesis 3.

Finally, we examined differences in work-family balance, job satisfaction, organizational commitment, and turnover intention among profiles to test Competing Hypotheses 4–5 (Table 3). Hypothesis 4 stated job-related cognitions are more positive for profiles characterized by high teaching hours (teaching and teaching and service profiles) compared to profiles characterized by high research hours (research profile). Hypothesis 5 stated job-related cognitions are more positive for profiles characterized by high research hours (research profile) compared to profiles characterized by high teaching hours (teaching and teaching and service profiles). Omnibus chi square tests indicated profiles differed in terms of work-family balance (χ^2(3) = 46.48, p < .01) and job satisfaction

Table 1
Sample size, means, standard deviations, and zero order correlations among study variables.

	N	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Research hours	549	22.21	11.35												
2. Teaching hours	549	20.81	1.54	-0.37**											
3. Mentoring hours	549	7.58	5.27	-0.04	-0.16**										
4. University service hours	549	6.66	4.95	-0.29**	0.00	0.27**									
5. Professional service hours	549	5.27	4.44	-0.03	-0.11*	0.26**	0.21**								
6. Housework hours	549	17.60	11.29	-0.09*	0.12**	0.07	0.09*	0.13**							
7. Childcare hours	549	13.91	2.05	-0.04	-0.13**	0.05	0.00	-0.05	0.08						
8. Eldercare hours	549	1.51	4.96	-0.07	0.08	-0.01	0.00	0.15**	0.10*	-0.04					
9. Gender[a]	548	1.41	0.49	-0.13**	0.07	0.04	0.03	-0.00	0.05	0.12**	0.10**				
10. Work-family balance	510	3.23	0.96	0.01	-0.15**	-0.12**	-0.05	-0.03	0.01	-0.13**	-0.05	-0.17**			
11. Job satisfaction	549	3.79	0.99	0.11*	-0.14**	-0.05	-0.11*	0.00	-0.07	-0.06	-0.06	-0.04	0.41**		
12. Affective commitment	549	3.31	0.92	0.00	0.02	0.00	0.11*	0.00	-0.06	-0.09*	-0.03	-0.08	0.17**	0.48**	
13. Turnover intentions	549	2.53	1.23	0.03	0.06	0.04	0.03	-0.04	-0.04	0.12**	-0.09*	-0.02	-0.24**	-0.56**	-0.42**

N = Sample size. M = Mean. SD = Standard deviation.
* p < .05.
** p < .01.
[a] 1 = men, 2 = women.

Table 2

Time allocation latent profile analysis fit statistics.

Fit statistic	Number of classes					
	1	2	3	4	5	6
LL	−6076.99	−6013.51	−5975.7	**−5960.32**	−5949.25	−5940.58
Number of parameters	6	10	14	**18**	22	26
AIC	12,165.99	12,047.02	11,979.39	**11,956.65**	11,942.5	11,933.16
BIC	12,191.84	12,090.1	12,039.7	**12,034.19**	12,037.27	12,045.17
SSBIC	12,172.79	12,058.36	11,995.26	**11,977.05**	11,967.44	11,962.64
LMR		122.13*	72.75*	**29.57***	21.31	16.68
BLRT		126.97*	75.63*	**30.74***	22.15*	17.34*
Entropy		0.70	0.69	**0.66**	0.72	0.68

LL = Loglikelihood. BIC = Bayesian information criteria. SSBIC = Sample size adjusted Bayesian information criteria. AIC = Akaike information criteria. LMR = Lo-Mendell-Rubin test. BLRT = Bootstrapped likelihood ration test. Bolded values indicate the model supported for each statistic.
   * $p < .05$.

Table 3

Latent profile estimates for time allocation domains, gender, nonwork time, and job-related perceptions and attitudes using absolute number of work hours.

	Classic	Research	Teaching	Teaching and service
Percentage of sample	51.57%	20.07%	15.80%	12.56%
Time allocation domains				
Research	20.28	37.84	13.17	16.51
Teaching	27.09	20.04	42.83	28.92
Service	10.18	8.52	11.62	24.98
Total hours	57.54	66.93	69.09	71.59
Correlates				
Gender	0.43	0.32[b]	0.49[a]	0.37
Housework hours	18.12[a]	14.81[b]	18.99[a]	18.00
Childcare hours	15.19	13.07	11.17	12.31
Eldercare hours	1.34	0.99	2.17	2.40
Work-family balance	3.47[a]	3.15[b]	2.75[c]	3.26[ab]
Job satisfaction	3.97[a]	3.91[ab]	3.22[c]	3.63[b]
Affective commitment	3.28	3.29	3.31	3.50
Turnover intentions	2.46[b]	2.58	2.77[a]	2.45

Note. Values are parameter estimates derived from latent profile analyses with auxiliary variables. Different superscripts indicate statistically significant differences across profiles, $p < .05$.

($\chi^2(3) = 34.43$, $p < .01$), but not affective commitment ($\chi^2(3) = 0.30$, $p = .3.71$) or turnover intentions ($\chi^2(3) = 4.43$, $p = .22$). When examining the pairwise contrasts, the classic and teaching service profiles had the highest work-family balance, followed by the research profile, and finally the teaching profile. The classic and research profile had the highest job satisfaction, followed by the teaching and service profile, and finally the teaching profile. None of the pairwise contrasts were statistically significant for affective commitment. Finally, one significant pairwise contrast emerged for turnover intentions, such that the teaching profile had higher turnover intentions than the classic profile ($p < .05$). The pattern of findings does not support Hypothesis 4, as none of the contrasts indicated the teaching profile had the highest job-related cognitions. The pattern of findings lend some support to Hypothesis 5, as the research profile was among the highest in job satisfaction, and was never among the lowest profiles in each pairwise contrast. However, the two non-hypothesized profiles, particularly the classic profile, are characterized by the most positive outcomes.

4.1. Supplemental analyses

Supplemental analyses were run to test the robustness of our findings given several potential confounds. Full results for all analyses are available upon request.

4.1.1. Institutional and individual confounds

Institutional and individual factors, such as tenure status, R1 status vs. non-R1 status university, STEM vs. non-STEM discipline, marital status, and age, may shape faculty's time allocation decisions (e.g., BrckaLorenz et al., 2018; Singell, Lillydahl, & Singell, 1996). For example, pressure to spend time on research at the expense of teaching and service time is especially prevalent within research institutions (e.g., Fairweather, 1993; Winslow, 2010), and studies find systematic differences in time allocation as a function of tenure status such that tenured faculty tend to engage in more teaching, mentoring, and service relative to untenured tenure-track faculty (e.g., Misra et al., 2012; Winslow, 2010). We examined the extent that the four profiles differ in terms of each potential confound to identify if there are systematic differences across groups using the R3STEP command in Mplus.

Regarding tenure status, faculty in the teaching and service profile are significantly more likely to be tenured compared to those in the teaching ($p = .04$) and research profiles ($p = .01$). Regarding R1 status, faculty in the research profile are significantly more likely to be in R1 institutions compared to all other profiles ($p < .05$). Regarding STEM status, there were no differences across profiles. Regarding marital status, only one contrast emerged such that the classic profile had a significantly higher proportion of married individuals compared to the teaching profile (87% vs. 73%, $p = .01$). Regarding age, faculty in the teaching and service profile are older than faculty in the research ($p = .01$) or classic ($p < .01$) profiles. Although several significant differences emerged in potential confounding factors, the patterns of contrasts did not mirror significant contrasts found in our hypothesis tests. As an exception, R1 status may be confounding the association between the research profile and sex and household hours.

To test the extent that our results might generalize to these more homogenous contexts, we also re-ran our analyses using only data from Research 1 designated institutions ($N = 400$). Four profiles emerged for the Research 1 sample that were identical to those found in the main sample. Gender and housework hours' associations with profile membership replicated our initial findings ($p < .05$). Estimated job-related cognitions were similar to those found in the main sample, such that work-family balance was highest for the classic profile and lowest for the teaching profile compared to all other profiles ($p < .05$) Job satisfaction was higher for the classic and research profiles compared to the teaching and teaching and service profiles ($p < .05$). No profile differences emerged for affective commitment or turnover intentions ($p > .05$). Overall, these findings show our findings are replicable in a Research 1 institute subsample.

4.1.2. Profile equivalence across gender

It might also be the case that men and women engage in qualitatively different types of time allocation profiles. For example, men and women may both engage in research-heavy time allocation strategies, although women's research-heavy profile may consistent of relatively less research time than men's research heavy profile. To test whether men and women differ in emergent time allocation profiles, we used multiple group latent profile analysis to identify and compare profiles for men and women. We replicated the four profiles found in our main hypothesis test analyses for men and women. We then used model constraints in Mplus to conduct a Wald test comparing a means and probabilities unconstrained model to one in which the means for research, teaching and service time for one of the four profiles was constrained for men and women. The Wald test comparison was conducted for each of the four profiles. Wald comparisons showed no gender differences for the classic, teaching, or teaching and service profiles ($p > .05$). The research profile significantly differed for men and women such that within the research profile, women had on average 6.56 fewer research hours and 4.34 greater teaching hours compared to men ($p > .04$). These differences suggest even within research-heavy time allocation profiles, women dedicate relatively less time to research and more time to teaching compared to their male colleagues.

4.1.3. Using proportion of time allocation hours

One noticeable confound in our findings is that the classic profile has at least nine fewer hours per week compared to all other profiles. The classic profile also tends to be associated with the most positive outcomes. Although not all findings can be explained by the pattern of total hours, it may be that total hours are driving differences for the classic profile compared to other profiles. To explore this issue, we conducted all hypothesized analyses using the proportion of total work hours dedicated to research, teaching and service, rather than the absolute number of hours. This allowed us to create profiles and examine correlates when the total number of hours is essentially equivalent across all profiles.

Results overall were highly consistent with our main analyses. The same four profiles emerged, although there appear to be relatively more individuals in the teaching profile (24.62%) and relatively fewer in the classic profile (39.46%) compared to our main analyses. Consistent with Hypothesis 2, women were more likely to engage in the teaching and service profile compared to the research profile ($p = .03$). Consistent with Hypothesis 3, the research profile was associated with fewer housework hours compared to the other three profiles ($p < .01$). The teaching and service profile was also associated with greater childcare hours than the teaching profile ($p = .03$), and greater eldercare hours than the classic profile ($p = .03$). Regarding work-family balance, the research profile no longer differed from the classic profile ($p = .40$), and the teaching and service profile no longer differed from the teaching profile ($p = .06$). Consistent with Hypothesis 5, the research profile was associated with greater job satisfaction than the teaching and service profile ($p = .02$). Job satisfaction was also no longer significantly different for the teaching profile compared to the teaching and service profile ($p = .53$). Finally, turnover intentions was no longer significantly different for the classic profile compared to the teaching profile ($p = .38$). Overall, these results continue to show a pattern that supports the effort-reward imbalance model more so than the job enrichment model. Additionally, the pattern confirms a classic profile tends to be associated with the most positive outcomes.

5. Discussion

The present study aimed to understand implications of work intrarole time allocation, specifically faculty member time dedicated to research, teaching, and service. We investigated relationships between time allocation profiles and gender and household labor, as well as work-family balance, job satisfaction, organizational commitment, and turnover intentions.

We found four profiles that characterize faculty time use. Two of these profiles reflected a single domain of focus (research profile or teaching profile) while two reflected dual-domain focus (the classic research and teaching profile or teaching and service profile). The classic, research, and teaching profiles are consistent with the "classic," "research-heavy," and "teaching-heavy" profiles found in previous work (BrckaLorenz et al., 2018). BrckaLorenz et al. (2018) also found a service-heavy and moderate-load profile which did not emerge in our sample, whereas we found a dual teaching and service profile that did not emerge in BrckaLorenz et al.'s (2018)

study. These differences are largely attributable to differences in sampling. Brcka Lorenz's distinct profiles likely reflect administrative (service-heavy) and lecturer (moderate-load) positions, which were excluded from our analysis. By honing in on tenure-track faculty, we reveal a novel and distinct dual-focus on teaching and service. This profile emerged even within a sub-sample of faculty in research institutions. The emergence of the teaching and service profile and its relevance for job-related cognitions highlights the importance of using a profile approach. If we had treated teaching, research, and service hours individually, we would not have identified this time allocation strategy.

Profiles were differentially associated with gender, such that women were more likely to be members of the teaching profile compared to the research profile. This finding is consistent with previous research, which finds women faculty tend to spend more time on teaching than male faculty, whereas male faculty members tend to spend more time on research compared to women faculty (e.g., Dahm et al., 2015; Link et al., 2008; Toutkoushian & Bellas, 1999). Further, we found time allocation profiles are associated with housework hours, although no association was found for child or elder caregiving hours. Individuals in the teaching and classic profiles reported greater housework hours than did those in the research profile. This is consistent with findings that use demographic proxies for household responsibility, such as gender and parental status (Jacobs & Winslow, 2004; Misra et al., 2012; Winslow, 2010).

Individuals with a classic dual focus on research and teaching consistently demonstrated the most positive outcomes (highest work-family balance and job satisfaction, lowest turnover intentions), whereas those who focus more exclusively on teaching had the most detrimental outcomes, compared to other groups. This finding is most consistent with the effort-reward imbalance model (Siegrist, 1996), which suggests individuals who devote time and effort to work that is not rewarded are likely to have poor job-related cognitions. Research time is most highly rewarded, particularly in comparison to teaching and service tasks (Bozeman & Gaughan, 2011; Fairweather, 1993). Those in the teaching profile may be less satisfied due to lower pay and fewer university perks (i.e., fewer rewards) relative to those who focus on research.

The research and dual-focus teaching and service groups were both middling, whereas based on the effort-reward imbalance model we might expect the research group to have the best outcomes among all profiles. This is again where profile analysis yields a unique insight. It is likely that the combination of effort-reward imbalance and job enrichment explains the patterns of job-related cognitions across profiles better than any single domain alone. For example, the classic group spends a majority of time on teaching or service on average (combined total of 37.37 h per week) compared to research (20.28 h per week). Perhaps this balance of 2/3 enriching job tasks combined with 1/3 rewarded job tasks is a goldilocks fit for many academics. An over-emphasis on either enriching tasks (teaching, service) or rewarded tasks (research) is relatively more detrimental for faculty members' work-family balance and satisfaction, particularly when research is downplayed in favor of teaching.

5.1. Theoretical implications

Our results have several theoretical implications. First, our results highlight the importance of examining multiple time allocation domains simultaneously, and demonstrate latent profile analysis is an effective tool for furthering this line of research. Not only did we find unique sub-populations of time use that differed from the "classic" norm described in previous research (BrckaLorenz et al., 2018; Misra et al., 2012), we also found these profiles were differentially associated with job-related cognitions that have implications for career success. Research on time allocation within the work domain is rare; we encourage future work using the latent profile strategy in order to holistically understand how individuals balance their time across multiple demands in conjunction in with one another.

Second, time allocation has implications for work-family balance, job satisfaction, and turnover intentions. Although this finding is based in a sample of faculty members, this implication likely extends to myriad other working professions in which individuals make decisions about how to allocate their time across different task domains. Each correlate is an important factor in determining career decisions, such as turnover (Wright & Bonett, 2007). Our study thus contributes to understanding factors that predict career success and turnover and has potential implications for understanding women's exit from the academy (Goulden et al., 2011). Specifically, our work suggests individual time allocation decisions and institutional norms around time allocation have the potential to shape a sense of work-family balance, job satisfaction, and turnover intentions. Women were most likely to engage in the teaching intensive profile, a profile that was also associated with the lowest work-family balance, lowest job satisfaction, and highest turnover intentions among the four profiles. Our results suggest women may have less work-family balance and positive career attitudes than their male peers due to disproportionately more time allocated towards teaching and less time allocated towards research. Extended beyond the academy, it is possible that a barrier to women's advancement in other fields also stems from gendered time allocation strategies that favor stereotypically feminine, yet under-valued tasks (Grant & Sandberg, 2015). Institutional and individual time allocation strategies may be an important target for job attitude change and retention.

Third, our study investigated two competing theoretical rationale to explain why time allocation is associated with job-related cognitions. In doing so, we add theoretical backbone to a largely empirically-driven topic. Using a strong inferences paradigm, we found the effort-reward imbalance model best explains the association between time allocation and job-related attitudes and well-being. The effort-reward imbalance model posited faculty who prioritized research and de-emphasized teaching would demonstrate the best well-being and job attitude outcomes. However, a dual-focused balance between enriching and rewarding characteristics seems to produce the best outcomes. When examining time domains in isolation (e.g., Dahm et al., 2015; Singell, Lillydahl, & Singell, 1996; Misra et al., 2012; Winslow, 2010), this balance might manifest as curvilinear associations between time spent in each domain (research, teaching, and service) in relation to job or wellbeing outcomes. Overall, our results suggest examining person-centric profiles that characterize the balance of working responsibilities is critical for understanding how time allocation impacts workers' job and wellbeing outcomes.

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Fourth, our findings have implications for understanding how nonwork might shape or be shaped by time allocation within the work domain. Whereas many previous studies have focused on parental status and marital status as proxies for work in the home (Goulden et al., 2011; Jacobs & Winslow, 2004; Winslow, 2010), our study suggests future research might focus on housework hours specifically. Relative to childcare or elder care, housework may be the most malleable household labor domain we examined. We further demonstrate household labor is most strongly tied to research time, such that those who prioritize research do less housework than all other profiles. Theoretically, this may be due to social or institutionalized day-to-day pressures associated with teaching and service, or it may be due to the increased self-regulatory effort needed to complete research tasks (Dahm et al., 2015; Misra et al., 2012). This result may also be a function of gender, as the research profile had the fewest women compared to other profiles. Future research might investigate and disentangle these possibilities to gain theoretical insight into why and how household labor impacts allocation towards research. Such an investigation is particularly important in light of our findings that suggest an under-emphasis on research time has negative implications for job-related cognitions.

5.2. Practical implications

Our research indicates that women were most likely to engage in the teaching intensive profile, with correspondingly poorer job-related cognitions. We argued this profile potentially has an imbalanced enriching and rewarding task balance. We could also interpret our results to suggest that institutional task reward structures are imbalanced. Task rewards for research are well-established in academe and include both internal and external opportunities for recognition—most of which are incorporated into faculty vita and promotion packets. Fewer institutions, however, have comparable reward systems for successful teaching or service, systems that are (like research) peer-assessed, recognize both immediate and long-term excellence, and involve public recognition at multiple academic levels. Indeed, perhaps the diversity and availability of task rewards for research in part drives its relationship to these job satisfaction variables. Institutions and professional organizations could create awards to recognize teaching and service accomplishments among faculty. Tenure and promotion committees could be provided with guidance to encourage weighting of such accomplishments in line with research accomplishments. Deans and chairs could be encouraged to track, distribute, and be held accountable for gendered service commitments to help ensure women are not disproportionately invited relative to men. Perhaps one mechanism by which service disparities occur is lack of transparency in how much service is typical or recommended. Transparent service obligations across the department or transparent expectations from deans and chairs may help to even the playing field, and, per our study findings, perhaps also feelings of work-life balance, job satisfaction, and turnover intentions across men and women.

Faculty who want to shape their time to reflect the classic profile in an effort to improve their work-family balance, job satisfaction, or turnover intentions might purposefully craft their time. For example, faculty might create strict boundaries to purposefully dedicate time and prevent spillover across time allocation domains, particularly boundaries to protect desired research and teaching time (see for example Kreiner, Hollensbe, & Sheep, 2009 for a discussion of work-nonwork boundary management strategies). Career counselors could similarly advise that workers (and aspiring work entrants) develop time management skills in which work time is segmented across tasks to help manage workload, while ensuring individuals are not overwhelmed by time devoted to teaching demands.

5.3. Limitations and future directions

Our study is limited in that we use a single-source, cross-sectional design. Results may be somewhat colored by personality or mood. However, due to our analytical approach and focus on time allocation behaviors in relation to demographic factors and attitudes, it is somewhat unlikely that same-source, cross-sectional biases completely explain our results. Our dependent care variables assume care for those under 18 or over 65. Our assessment may have missed care responsibilities that occur for dependents aged 18–65. We also did not have a second sample or a large enough sample to split to replicate our profile analysis. Replication is particularly important for latent profile analysis, because it is data-driven. To mitigate this concern, we also interpreted our results with theory and previous research in mind, and we ran supplementary analyses to test potential confounds. Although our profiles were replicated and similar results patterns emerged, we suggest future research replicate our findings using a large tenure-track faculty sample.

We inferred enriching and rewarding characteristics of research, teaching, and service tasks based on previous research. It is possible that individual differences or professional identities explain why faculty have differential preference for research, teaching, and service (Dahm et al., 2015; Winslow, 2010). Further exploration and explicit testing of both the job characteristics and effort-reward imbalance model could yield new insights into *why* differences occur in faculty time allocation. For example, a future study might include survey items that assess enriching qualities (e.g., task identity, feedback) and/or perceptions of reward associated with faculty time domains in order to model these psychological assessments as mediators. Another approach might assess the fit between faculty preferred time allocation and actual time allocation (see for example Dahm et al., 2015). A daily diary study could measure start-of-day preferences and end-of-day actual time allocation to assess whether the degree of match or mismatch between actual and preferred daily time dedicated to research, teaching, and service predicts job-related cognitions above and beyond the number of actual hours.

Our study focused on time allocation strategies used by faculty that work a typical number of weekly hours (in our study, an average of approximately 62.5 h per week; see also Link et al., 2008; Misra et al., 2012; Singell, Lillydahl, & Singell, 1996; Watanabe & Falci, 2016). Our focus on typical faculty is a strength in that it allows us to clearly define to whom our findings generalize, and it allows us to find time allocation profiles that characterize the majority of faculty across a variety of institutions, disciplines, and

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tenure-track levels. However, our findings are also limited in that they may not generalize to faculty who work an extremely high number of hours. Indeed, we eliminated nearly 200 faculty members who reported extremely high weekly working hours. To our knowledge, previous research has not identified this extreme group of workers. Future work might specifically recruit extreme workers and use qualitative or experience sampling methods to better understand why such extreme hours are reported, as well as explore the predictors and implications of extreme faculty working hours.

Finally, longitudinal analyses in which surveys are administered with large 5–10 year lags would help to illuminate potential societal shifts in academic and gender norms. Additionally, studies examining within-person change using daily or monthly assessments are needed to better understand how and why faculty adjust their time allocation strategies, as well as to determine how effective such shifts are in terms of promoting career, family, and well-being outcomes.

6. Conclusion

We find four distinct profiles characterize faculty time allocation, including a focus on research, a focus on teaching, balanced teaching and service, and a classic balanced research and teaching. Profiles that emphasize teaching were associated with female academics and increased housework, compared to those emphasizing research. In support of the effort-reward imbalance model, time allocation strategies that focused on multiple rewarded tasks were associated with the most positive correlates while exclusive focus on enriching but unrewarded tasks had the worst work-family balance, job satisfaction, and turnover intention. Overall, intrarole time allocation is relevant for career and nonwork attitudes that have implications for success.

CRediT authorship contribution statement

Kimberly A. French: Conceptualization, Methodology, Data curation, Writing - original draft, Formal analysis, Project administration. **Tammy D. Allen:** Conceptualization, Methodology, Resources, Data curation, Writing - review & editing, Supervision, Project administration, Funding acquisition. **Michelle Hughes Miller:** Conceptualization, Methodology, Writing - review & editing, Funding acquisition. **Eun Sook Kim:** Methodology, Writing - review & editing, Supervision. **Grisselle Centeno:** Methodology, Writing - review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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