# What does non-standard employment look like in the United States? An empirical typology of employment quality

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## Abstract

Despite significant interest in the changing nature of employment as a critical social and
economic challenge facing society—especially the decline in the so-called Standard Employment
Relationship (SER) and rise in more insecure, precarious forms of employment—scholars
have struggled to operationalize the multifaceted and heterogeneous nature of contemporary
worker-employer relationships within empirical analyses. Here we investigate the character and
distribution of employment relationships in the U.S., drawing on a representative sample of
wage-earners and self-employed from the General Social Survey (2002 – 2018). We use the
multidimensional construct of employment quality (EQ), which includes both contractual (e.g.,
wages, contract type) and relational (e.g., employee representation and participation) aspects of

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employment. We further employ a typological measurement approach, using latent class analysis, to explicitly examine how the multiple aspects of employment cluster together in modern labor markets. We present eight distinct employment types in the U.S., including one resembling the historical conception of the SER model (24% of the total workforce), and others representing various constellations of favorable and adverse employment features. These employment types are unevenly distributed across society, in terms of who works these jobs and where they are found in the labor market. Importantly, women, those with lower education, and younger workers are more likely to be in precarious forms of employment. More generally, our typology reveals limitations associated with binary conceptions of standard vs. non-standard employment, or insider-outsider dichotomies envisioned within dual labor market theories.

### Keywords

Employment quality; nonstandard employment; latent class analysis; labor market segmentation; precarious employment

## 1.  INTRODUCTION

A growing body of research has suggested dramatic changes in the organization and character of employment relations over the last several decades. Understanding contemporary employment arrangements is critical for several reasons. Most directly, the nature and quality of employment is of paramount importance for individuals' social and economic well-being. This can be illustrated, for example, in the growing body of research linking various aspects of employment to worker's physical and mental health (Benach et al., 2014). Further, employment relations are implicated in the generation and reproduction of social inequalities, as beneficial and adverse employment conditions are unevenly distributed across major axes of social stratification (e.g., race/ethnicity, gender, class) (Puig-Barrachina et al., 2014; Scott-Marshall, 2010). The employment relationship is also the level at which many labor regulations and interventions are designed and implemented; however, adequate surveillance of employment conditions is a critical precursor to developing effective policy to enhance worker well-being and social equality. Yet, despite sustained interest in this topic, researchers have struggled with conceptualizing and operationalizing the multifaceted and heterogeneous nature of modern employment within quantitative research frameworks.

One useful way to describe recent labor market trends is the observation that—due to a variety of economic and sociopolitical drivers, such as decelerated economic growth, technological innovation, and the globalization of product and labor markets—there has been a general decline of the so-called "Standard Employment Relationship" (SER) (Benach et al., 2014; Kalleberg, 2003, 2011). The SER concept gained footing as the normative gold standard for employment relations in the Post-WWII era, being conceptualized as stable, full-time employment, with regularly scheduled hours, secure pay and benefits, collective representation, and adequate social protections (Bosch, 2004; Kalleberg et al., 2000). Although SER was never truly a 'standard' labor market experience—women and people of color were often excluded even during its supposed apex, nor is it typical within

a broader historical perspective of capitalism (Kalleberg & Vallas, 2017; Quinlan, 2012)—it provides a useful point of departure for studying contemporary employment relationships in a nuanced and comprehensive manner (Van Aerden et al., 2014). In particular, we highlight two key insights from the SER concept that elucidate paths toward improved measurement of employment relationships for quantitative analysis.

For one, the 'decline of SER' framing reveals that employment relations can shift across multiple dimensions relevant to workers' experience in their jobs. For instance, the de-standardization of employment could manifest as increasingly insecure contracts, lower levels of compensation, irregular working hours and schedules, or more unbalanced worker-employer power dynamics. Yet most researchers investigating the character of employment relations have used unidimensional approaches, focusing on only one aspect of employment at a time (Hudson, 2007). Further, much of the existing literature on employment relations has focused on a narrow set of employment characteristics, namely various forms of non-permanent contractual arrangements (e.g., Fuller & Vosko, 2008). While such studies have provided valuable insights, we believe that acknowledging the multidimensional nature of employment relationships is a key first step in advancing measurement thereof.

Second, the SER concept calls attention to the fact that workers experience employment relationships as a package, consisting of various configurations of favorable and adverse features—it is largely the combination of stability, adequate compensation, social protections, etc., that position SER as the normative ideal-type employment. Therefore, in addition to recognizing employment relationships as a multidimensional phenomenon, we must account for the fact that the multiple dimensions can deviate from the SER ideal to various degrees, creating numerous potential patterns of employment. This insight calls into question empirical approaches that assume that the quality of employment can be adequately captured as a dichotomous variable or positioned within continuous scales from low to high —for example, along axes of income or insecurity (Van Aerden et al., 2014). On the other hand, research traditions such as labor market segmentation are explicitly based on theory in which good and bad job features are thought to cluster together (Doeringer & Piore, 1971). Nevertheless, analyses from this literature typically do not empirically investigate how various aspects of employment relationships are actually patterned. Instead, they assume certain labor market divisions exist (e.g., dualist theories of 'insiders' vs. 'outsiders') and document the extent to which they can be observed (Yoon & Chung, 2016).

This study is focused on advancing the ways in which employment relationships are theorized and measured within empirical research. Specifically, we construct a multidimensional typology of employment quality within a representative sample of wage earning and self-employed workers within the U.S. labor force, following closely the approach proposed by Van Aerden et al. (2014). This study is in line with a growing number of studies that have attempted to identify empirical configurations of employment in contemporary labor markets using data-driven approaches (Doerflinger et al., 2020; Eisenberg-Guyot et al., 2020; Gevaert et al., 2020; Jonsson et al., 2020; Lukac et al., 2019; Van Aerden et al., 2014; Yoon & Chung, 2016). However, prior research has been mostly confined to the European context and has rarely included the conditions and experience of the self-employed; therefore, by investigating the U.S. context and specifically

examining self-employment, this study addresses these substantive gaps in the literature. Before describing our methods and findings, we outline the theoretical and methodological rationale for such an approach.

## 2. BACKGROUND

### 2.1. Developing a meaningful measure of employment relations

In considering how to construct a useful measure of employment relationships, we are influenced by recent scholarship concerned with operationalizing job quality in the European Union (E.U.) (Muñoz de Bustillo et al., 2009). This literature is particularly useful due to its goal of imposing structure to the wide variety of potential job-related benefits and risks, specifically to develop quantitative indices for comparative research (Vanroelen, 2019). Several critical reviews and syntheses of the many proposed job quality metrics provide useful insight regarding the development of an employment measure (Holman & McClelland, 2011; Muñoz de Bustillo et al., 2009; Piasna et al., 2017).

First, there is widespread agreement that examining the character and quality of jobs involves measuring multiple dimensions. Job quality researchers further make a conceptual and analytical distinction between *work* features and *employment* features (Holman & McClelland, 2011; Muñoz de Bustillo et al., 2009). Work features concern the intrinsic characteristics of job tasks (e.g., whether tasks are complex or varied, autonomy over one's work tasks) and the physical and psychosocial environments in which work takes place (e.g., chemical exposures, psychological demands). On the other hand, in this study we are focused on employment features, which include the nature of the employment contract and worker-employer relations. Although terms such as 'quality of employment', 'working conditions', and 'job quality' are often used interchangeably (Burchell et al., 2014), herein we use 'employment' in a purposeful way; for instance, in characterizing employment relationships, we are not interested in the character of job tasks or measures of job stress (such as those based on the job demand-control model proposed by Karasek (1979)).

A second insight cautions against the usage of purely subjective measures (Burchell et al., 2014; Muñoz de Bustillo et al., 2009; Piasna et al., 2017). Job quality scholars have noted that subjective assessment of job satisfaction, for example, depends largely on workers' individual preferences and expectations (Piasna et al., 2017). With regard to measurement of employment relationships, this is analogous to assessments of subjective job insecurity, which typically concern workers' perceptions related to the threat of involuntarily job loss or fear of losing other valued job features (De Witte et al., 2016). Perceived job insecurity measures are likewise susceptible to variation by both individual-level (e.g., expectations) and macro-level contextual factors (e.g., unemployment rates), rather than capturing the reality of actual employment conditions (Benach et al., 2014). Such measures are therefore not suitable for characterizing the objective structure of modern employment relationships.

A third concern is the appropriate level of measurement. Here, we are focused on the level of the employment relationship itself, as we are interested in capturing the conditions of worker-employer relationships. Other levels of analysis, such as workers themselves (e.g., gender, human capital endowments) or labor market institutions and regulatory policy

regimes (e.g., union density, generosity of welfare state), are important in understanding the causes and consequences of various forms of employment, but should not be included in measures thereof (Bodin et al., 2020; Burchell et al., 2014; Piasna et al., 2017). In other words, we seek to separate workers' experience within a job (e.g., perceived insecurity, employment precariousness) as downstream of actual employment conditions on a causal pathway, and moderated by their personal circumstances; similarly, regulatory and other sociopolitical forces that shape labor markets are antecedent to the type and distribution of employment arrangements, and also moderate worker-level outcomes. This approach differs, for example, from other studies that have operationalized precariously-employed *workers*, combining employment characteristics with aspects of workers' individual social and policy contexts into a single variable (e.g., see Olsthoorn, 2014).

### 2.2. The multidimensional construct of employment quality

In terms of what aspects of employment to measure, we start from a broad and idealized conception of the SER. We specifically desire to move beyond a dynamic in which SER is operationalized as simply whether or not a worker is engaged in a permanent, ongoing contract, distinguishing these workers from all others within various forms of 'non-standard' employment contracts (e.g., fixed-term direct hires, temporary agency workers, part-time) (e.g., Kalleberg et al., 2000). In our view, the SER concept is instead meant to conjure a broader social contract between worker and employer, manifesting in security and stability across workers' compensation, working times, rights and protections in the workplace, development opportunities, collective representation, and participation in decision-making (Bosch 2004). As with contract type, other aspects of employment are often examined individually; for example, many studies have measured the quality of employment as a function of wages (e.g., Howell and Kalleberg 2019). However, the nature of one's employment clearly goes beyond contractual stability and wages. For instance, research focused on the timing, stability, and flexibility of work schedules has found that scheduling practices resulting in volatile and inflexible work hours (e.g., little advanced notice, varying number and timing of hours, limited worker input/control over working times) are widespread in the contemporary labor market (Lambert et al., 2019; Schneider & Harknett, 2019). While the use of pragmatic measures such as contract type or wages is justified to the extent that these variables are correlated with other dimensions of employment, these narrowly-defined metrics are inherently limited, and a multidimensional approach is needed to better understand the microstructures of existing employment relationships.

To address the multidimensional reality of employment relations, we use the construct of employment quality (EQ). Building on a series of recent studies, we conceptualize EQ as consisting of the following seven dimensions: [1] employment stability, [2] material rewards, [3] workers' rights and social protections, [4] working time arrangements, [5] training and employability opportunities, [6] collective organization, and [7] interpersonal power relations (Gevaert et al., 2020; Julià et al., 2017; Peckham et al., 2019; Van Aerden et al., 2014, 2016, 2017). The EQ construct largely developed alongside recent attempts to operationalize precarious employment within occupational health research (see Julià et al., 2017). These researchers have the specific goal of characterizing health implications of non-standard and insecure employment, building upon a large body of research showing that

work-related insecurity can arise from a range of factors beyond non-permanent contracts (Scott-Marshall, 2010). In this regard, EQ and recent precarious employment measures emphasize relational dimensions of employment arrangements—for example, workers' rights, employee representation, and participation in workplace decision-making—rather than only contractual dimensions related to employment status or wages. We argue that the EQ framework thus maps on well to a broad view of the SER, accounting for the numerous aspects of an employment relationship that can potentially de-standardize. Additionally, prior research has shown that it is possible to operationalize EQ in accordance with the criteria described in the previous section using proxy indicators from secondary data (Van Aerden et al., 2014).

### 2.3. Typological measurement of employment quality

Within a quantitative analytic framework, acknowledging the multidimensionality of employment quality poses a methodological decision regarding choice of multivariate measurement approach. The typical method has been to assume that different aspects of employment can be meaningfully aggregated into a continuous measurement scale—for example, on a dimension from low to high job quality or employment precariousness. Mechanically, this can be accomplished by developing a composite index (e.g., Oddo et al., 2020), scale (e.g., Vives et al. 2015), or with data reduction techniques such as principle component or factor analysis (e.g., Hudson 2007). Subscales or sets of indicators can also be examined individually (Muñoz de Bustillo et al., 2009).

Alternatively, we argue that it is more valuable to conceptualize employment relationships as packages of features—good or bad, from the workers' perspective—that can be configured in various ways within any given arrangement. The extent to which different features combine together within jobs can be better characterized using a typological measurement approach, which assumes population heterogeneity in the studied phenomena due to underlying sub-populations. These sub-populations (or types) are typically characterized by frequent item response patterns. Typological measurement, also called a person-centered (as opposed to variable-centered) approach (Bergman & Magnusson, 1997), prototypically involves cluster or class-based methods. One such approach is latent class analysis (LCA), which identifies unobserved subgroups in a given population based on responses to a set of observed indicators. Scholars have noted that LCA has specific statistical advantages that make it useful for studying employment relationships, including ability to (a) elucidate complex patterns of multidimensional constructs; (b) test for measurement invariance across different contexts (e.g., year, country); and (c) estimate and adjust for model misclassification error when examining correlations with external variables (Lukac et al. 2019).

The notion that different employment characteristics cluster together in predictable combinations is an influential concept in the research of employment relations, especially within the labor market segmentation tradition. In particular, dual labor market theory proposes the existence of primary and secondary labor markets, with the former consisting of high quality, SER-like jobs, and the latter resembling an accumulation of poor employment features (Doeringer & Piore, 1971). More recently, however, scholars have

criticized the labor market dualism concept as too simplistic, and have sought more complex and detailed descriptions of existing employment segments (Davidsson & Naczyk, 2009; Vanroelen, 2019; Yoon & Chung, 2016). In contrast to a dichotomous labor market, a more likely scenario is that employers have responded to increasingly competitive economic trends with a number of different adaptation strategies in regard to the structuring of employment relations (Van Aerden et al., 2014; Vanroelen, 2019). One strategy could involve establishing a core group of highly-skilled and strategically important workers that receive favorable employment conditions in exchange for increasing their range of tasks, responsibilities, and commitment (e.g., an expectation of working overtime hours). This strategy provides a firm with functional versatility and high employee performance, while also enhancing workers' career opportunity and bargaining power (Kalleberg, 2003; Vanroelen, 2019). Such approaches have been described as 'high road' strategies (Bosch, 2004; Vanroelen, 2019), although this label seems only relevant from the perspective of workers within the core group. Other employer approaches are more straightforwardly 'low road'. These strategies involve a general diminishing of commitments and rewards directed to workers, with the goal of increasing firms' ability to adjust the size of its workforce and externalizing costs and risks onto workers or third-party entities (e.g., staffing agencies) (Kalleberg, 2003; Van Aerden et al., 2014). Low road strategies could manifest as insecure contracts, irregular and asocial working hours, low compensation, and generally poor relations between workers and employers. The pursuit of various high and low road strategies is thought to lead to multiple versions of 'non-standard' employment (Vanroelen, 2019).

A series of recent studies have empirically investigated employment patterns using typological measurement approaches, finding more heterogeneity than simplistic dualist insider/outsider or standard/non-standard dichotomies. The present study follows most directly the approach of Van Aerden and colleagues (Van Aerden et al., 2014, 2016), who employed LCA to characterize patterns of EQ among wage earners in the E.U. These researchers identified five employment types, including a SER-like group and various distinct EQ configurations consistent with both high and low road de-standardization strategies. One identified employment type was labeled 'instrumental', which resembled SER employment in that it was full-time permanent employment with stable hours and moderate compensation; however, this EQ type lacked opportunity for training or involvement in worksite decision-making. Two forms of precarious employment were also identified, each having high probabilities of low wages, non-permanent arrangements, and lacking employee representation or involvement. A 'precarious unsustainable' group was distinguished by high levels of involuntary part-time hours and low work hours, while a 'precarious intensive' group was characterized by unpredictable schedules, long hours, and uncompensated exceptional working time. Lastly, a 'portfolio' employment group was identified that consisted of long hours paired with mostly favorable employment features, including high compensation, predictable schedules, training opportunities, and worker voice. Another study guided by a similarly-theorized multidimensional construct of precarious employment found six forms of employment within Swedish register data, including a SER-like employment type and three distinct forms of precarious employment (Jonsson et al., 2020). Other studies from the labor market segmentation literature

have used slightly different theoretical frameworks to guide their measurement (namely multidimensional conceptualizations of worker insecurity) to identify between three and seven employment forms in the United Kingdom (Yoon & Chung, 2016) and E.U. (Doerflinger et al., 2020; Lukac et al., 2019). However, to our knowledge no such analysis has been conducted in the U.S. context, even though the quality of employment is likely to have outsized importance on livelihoods in the U.S., given the weak social wage provided by governmental benefits and insurance programs. Further, many studies have not included self-employed workers, who make up a substantial portion of the overall workforce typically deemed 'non-standard' (notable exceptions include Gevaert et al., 2020 and Jonsson et al., 2021).

### 2.4.  The current study

In this study, we investigate the character and distribution of employment relationships in the U.S. using a nuanced, theoretically-grounded approach that attempts to address methodological limitations present in the existing literature. Our approach uses the multidimensional construct of EQ, which includes both contractual and relational aspects of employer-worker relationships. Further, we employ a typological measurement approach, using LCA, to explicitly examine how the multiple aspects of EQ cluster together in the modern U.S. labor market. To assess the utility of our EQ measure, and to further understand how labor markets contribute to persistent social inequalities, we additionally examine how identified employment patterns are correlated with sociodemographic and labor market-related characteristics. Lastly, we contextualize our findings with those from similar studies examining the European labor market.

## 3.   DATA AND METHODS

### 3.1.  Data

To examine EQ in the U.S. context, we use data from the General Social Survey (GSS), a nationally representative, repeated cross-sectional survey of non-institutionalized American adults (Smith et al., 2019). Every four years since 2002, the GSS has included a Quality of Work Life (QWL) module, which assesses a variety of employment and working conditions among GSS respondents engaged in paid labor. Sample weights provided by the GSS are included in all analyses to account for number of adults in each household and nonresponse. Across five survey waves (2002, 2006, 2010, 2014, and 2018), a total of 7,407 respondents completed the QWL module and indicated that they were currently employed (i.e., working full- or part-time, or temporarily not working due to strike, vacation, or temporary illness).

### 3.2.  Measures

**3.2.1.    Employment quality indicators**—We operationalize the EQ construct using 11 proxy indicators available within the GSS, each representing various aspects of the seven conceptual EQ dimensions. These indicators are similar to those used in prior research on EQ conducted in the E.U. (Van Aerden et al., 2014, 2016, 2017). The first dimension of EQ, employment stability, contains a single measure of ***employment contract***. This item indicates whether a worker's main job is 1) regular, permanent employment or a 2) non-permanent (i.e., independent contractor; working under a contractor; employment on

an on-call basis, or paid by temporary agency). The second dimension, material rewards, includes an indicator of ***income level***. This item uses year-specific sample quartiles of individual labor income from their principal job to create three categories: 1) lowest; 2) second and third; and 3) highest quartile. The third EQ dimension, workers' rights and social protections, includes one indicator of ***mandatory days of extra work hours***. This indicator is measured by combining two items regarding a) the number days per month the respondent works extra hours beyond their usual schedule with b) if these extra hours were required by their employer. This measure has three categories: 1) zero days; 2) between 1 and 10 days; and 3) >11 days. Two proxy indicators are included to represent the dimension of working time arrangements. The ***number of working hours*** indicator has four categories: 1) <24 hours; 2) 25–36 hours; 3) 37–48 hours; and 4) >48 hours per week. The indicator for ***regularity of working times*** distinguishing between 1) day shift; 2) afternoon or night shift; and 3) split, irregular, on-call, or rotating shifts. The fifth dimension, training and employability opportunities, contains an indicator for ***opportunity to develop abilities***. This is a dichotomous measure indicating if the worker has an opportunity to develop their own special abilities: 1) yes ('very true' or 'somewhat true') and 2) no ('not too true' or 'not at all true'). The sixth dimension, collective power dynamics, includes two indicators. An indicator for ***having adequate information, equipment, and training*** combines two items asking if workers have enough a) help and equipment, and b) information to get their job done. This measure is dichotomized to 1) yes ('often' or 'sometimes' responses to both items) and 2) no (responses of 'rarely' or 'never' on at least one). Another indicator denotes ***union membership***: 1) yes and 2) no. The last dimension, interpersonal power relations, includes three indicators. The ***employee involvement*** indicator has three response categories indicating whether the respondent is 1) 'often'; 2) 'sometimes'; and 3) 'rarely' or 'never' able to make decisions on the job that affect them. The indicator for ***control over schedule*** is based on two items about whether workers are able to a) change starting/finishing times and b) take off work for personal/family reasons. This measure has three categories: 1) high control; 2) medium control; and 3) low control. The final indicator is ***abusive treatment***. This measure combines two items denoting having been a) sexually harassed or b) threatened or harassed in any other way by anyone while on the job in the last 12 months: 1) yes ('yes' to either item) and 2) no.

**3.2.2.    Sociodemographic and labor market-related covariates—**To understand the social profile of workers within different types of EQ, we examine five sociodemographic characteristics that are hypothesized to predict labor market position. These measures include ***gender*** (man, woman), ***race/ethnicity*** (non-Hispanic White, Black, Hispanic, Asian/Pacific Islander, American Indian/Alaska Native), ***nativity*** (born in U.S., born outside of U.S.), ***age***, and ***educational attainment***. Age contains three categories: early career (<30 years), mid-career (30–50 years), and the late-career period (>51 years). Educational attainment contains five categories: less than high school; high school; associate degree; bachelor's degree; and graduate degree.

To provide additional information on the character of employment types, as well as the location and distribution of EQ in the U.S. labor market, we examine three labor market-related variables, including ***occupation*** (2010 U.S. Census occupation codes), ***industry***

(North American Industry Classification System codes), and ***number of workers at worksite*** (1–9; 10–49; 50–499; >500).

### 3.3.    Analytic approach

**3.3.1.    Constructing a typology of employment**—We use LCA to identify a typology of employment based on the degree of similarity in workers' responses to the 11 EQ indicators. Because wage earning and self-employment are distinct forms of employment (e.g., they are governed by separate legal frameworks of employment law vs. contract law, respectively (Cappelli & Keller, 2013)), we model these working populations separately when creating our typology; fundamental differences in these types of employment might contribute to dissimilar meanings of some EQ indicators (e.g., working time arrangements might be self-imposed among self-employed). Self-employment was identified using the item, "Are you self-employed or do you work for someone else?", and respondents with no information for this item were excluded (n=13). We further excluded respondents without information on at least two EQ indicators (n=24); over 97% of respondents had information for at least 9 of the 11 EQ indicators. Missing values for EQ indicators are handled with maximum likelihood estimation assuming missing at random. The final unweighted sample used to identify the EQ typology was 7,368 workers (6,389 wage earners, 979 self-employed). Descriptive statistics for the weighted sample are included in Supplementary Materials (Table S1).

For model selection, we rely on both statistical and theoretical considerations. We first compare fit statistics across models with step-wise increases in the number of clusters (i.e., Akaike's information criterion [AIC], Bayesian information criterion [BIC], Vuong-Lo-Mendell-Rubin likelihood ratio test [VLMR-LRT]) to evaluate parsimony (Nylund et al., 2007). We then evaluate candidate models for conceptual clarity by interpreting the relationship between employment types and conditional item response probabilities (i.e., the probabilities of endorsing a particular response, given membership in a particular cluster). This substantive interpretation is both common practice and vital to determine the most stable and meaningful model (Masyn, 2013). The final models provide the number of distinct employment clusters in the population, the relative size of each cluster, and conditional item response probabilities—the latter of which provide conceptual understanding for the character of the identified employment types.

We also conducted robustness checks on our selected models. We examined entropy to assess how well the latent classes are identified; values approaching 1 indicate clearer delineation. To evaluate model fit, we examined bivariate residuals (BVRs), which provides information on model misfit due to conditional dependence between pairs of indicators that remains after accounting for the latent typology. Because we are pooling data for EQ indicators across multiple years, we also tested our selected latent EQ variables for measurement invariance across survey waves, following the approach recommended by Kankaraš et al. (2010) (see also, Lukac et al. 2019).

We used the mixture modeling function in Mplus Version 8 (Muthén & Muthén, 2017) to conduct all LCA modeling.

**3.3.2. Identifying correlates of employment quality—**To examine the social distribution of employment in the U.S., we use multinomial logistic regression to assess the correlation of the five sociodemographic indicators on EQ cluster membership, treating the latter as the response. Specifically, we use the three-step auxiliary variable approach for latent class predictors within Mplus (i.e., the R3STEP procedure) (Asparouhov & Muthén, 2014) to estimate odds ratios of cluster membership and 95% confidence intervals. This procedure accounts for classification uncertainty estimated in the LCA model when evaluating relationships between latent class variables and auxiliary covariates, and is superior to classify-then-analyze approaches that use modal assignment (i.e., individuals are assigned to their most likely cluster) (Mclarnon & O'Neill, 2018; Vermunt, 2010). To examine the distribution of employment across the labor market, we present mean cluster membership probabilities for each industry, occupation, and firm size.

## 4. RESULTS

### 4.1. Model selection

For wage earners, model fit indices indicate the optimal solution includes between three and eight classes, with the BIC and VLMR-LRT choosing a 5-class solution and the AIC continuing to improve to the largest, 8-class model, but relatively small improvements in fit indices after three classes (Table 1). We performed a thorough substantive interpretation of conditional probabilities for models containing three through eight clusters. While the 3-class solution was not readily interpretable, a class resembling the SER concept emerged in the 4-class solution and remained highly stable in subsequent models in terms of both cluster size and conditional probabilities. The 5-class solution included interpretable classes for three additional forms of employment characterized by regular, permanent employment contracts combined with varying patterns of other EQ features (eventually labeled *portfolio*, *dead end*, and *inflexible skilled* EQ types, as described below), along with a final class characterized by non-permanent contracts. In the 6-class solution, the latter class separated into two distinct forms of non-permanent employment (eventually labeled *precarious* and *optimistic precarious*), while the four previously identified classes remained stable in size and character. Importantly, a class resembling unambiguously precarious employment (i.e., a pattern of poor-quality employment features across all EQ dimensions) was identified in the 6-class solution; the existence of such a class is consistent with the empirical and conceptual EQ literature. The 7-class solution added a small, less conceptually coherent cluster. Thus, we find that the 6-class solution is the most scientifically meaningful. Further, the stability of interpretable clusters across the model set strengthened our confidence in the identified latent structure. In the self-employed sample, BIC and VLMR-LRT identified the 2-class model as fitting the data best, while AIC, again, improved in each subsequent model (Table 1). Based on conceptual interpretation, we chose the 2-class model as the most meaningful. Thus, based on the combination of fit, interpretation, and cluster size, we identified eight distinct patterns of employment in the U.S., with six among wage earners and two among the self-employed.

**4.1.1. Robustness checks—**Our results show our selected models have entropy values around 0.6, suggesting modest separation of classes. This finding bolsters the

need to account for classification uncertainty during covariate analysis using the three-step approach.

Examination of BVRs suggest poor model fit and conditional dependence between some EQ items, based on the commonly-used cutoff of 4 to indicate significant residuals; however, further probing of our models indicates our findings are very stable. The 2-class self-employed model had more significant BVRs (80%) compared to the 6-class wage earner model (64%), suggesting overall that the EQ indicators available in the GSS are better able to identify employment types within wage earners. However, Asparouhov & Muthén (2015) note that because the distribution of the BVR statistic is not known, a cutoff of 4 may be impractical; rather, they recommend focusing on the largest values. Looking at the sources of misfit, the highest BVRs in both models involve the union membership item (accounting for ~25% of all significant residuals). This may be explained by the presence of high missingness for this variable, a situation in which BVRs are rendered unreliable (Asparouhov & Muthén, 2015): due to the sampling methodology of the GSS only two thirds of workers that responded to the QWL module were asked about union membership. Alternatively, the relationship between union representation and EQ construct may be different in the U.S. compared to the E.U. We conducted several alternative specifications for the 6-class wage earner model to explore potential implications of conditional dependence on our scientific conclusions, including removing the union membership item, adding residuals correlations between the four item pairs with the highest BVRs, and both simultaneously; in all cases, residuals were not substantially reduced. However, interpretation of these alternative models confirmed that the same six classes were readily identifiable which, as described below, are concordant with theory and prior empirical research. Additionally, BVRs were not reduced in the 7-class model. As suggested by Yoon and Chung (2016), who conducted a similar analysis and likewise report high percentages of BVRs greater than 4 in their final model, our observed model misfit may be due to a largely deductive, theoretically driven measurement model developed with secondary data not specifically designed to measure the EQ construct. We therefore proceed with the selected models, acknowledging the emphasis on theory in our decision-making, which we believe is appropriate given the exploratory nature of this analysis and our goal of facilitating comparisons with prior E.U. research.

We also believe that our models sufficiently demonstrated measurement invariance to warrant pooling across survey waves. For the 2-class self-employed analyses, results were unambiguous: survey wave-specific latent class estimates did not significantly improve model fit. For the 6-class wage-earner analyses, a model in which all parameters are allowed to vary across wave was not reliably estimable due to insufficient sample size for so many estimates. However, examination of fit statistics across the models with different levels of parameter restrictions suggested, similar to the self-employed model, that including wave-specific estimates did not substantially improve model fit for the wage earners. Further detail regarding this testing is provided in the Supplementary Materials (Table S2).

### 4.2. Patterns of employment quality in the United States

The eight identified employment types are characterized by examining patterns of conditional item response probabilities within each cluster (Tables 2 and 3). The first employment type is identified as '*SER-like*' jobs, as these jobs most resemble the historical conception of SER employment described in the literature (Bosch, 2004; Van Aerden et al., 2014). This group is characterized by generally favorable employment conditions. SER-like jobs have a high probability of a permanent employment arrangement, full-time hours, and a day shift. Additionally, this group has a low probability of low income, long work hours, mandatory extra work hours, a lack of information or equipment, or experiencing threats or harassment at work. However, these jobs have only an average probability of having union representation, and moderate scores on opportunity to develop, control over their schedule, and employee involvement. This is the largest employment type, representing 28 percent of wage earners and 24 percent of the total workforce (i.e., including all workers, wage earner and self-employed). This class will be used as the referent group when examining sociodemographic predictors.

The second group is characterized overall by very beneficial indicators of EQ, except for a high probability of working long hours and lack of union representation. These jobs are similar to SER, with permanent arrangements and standard shifts, but are distinguished by having the highest income, most opportunity to develop, most control over schedule, and highest employee involvement. These jobs have a low probability of experiencing threats or harassment, lacking information or equipment, working atypical shifts, and being in a union. This highly advantaged group of workers, which represents 17 percent of wage earners and 15 percent of the total workforce, has been identified in prior theoretical and empirical research, including Van Aerden's modeling of EQ within the E.U. workforce (Van Aerden et al., 2014, 2016, 2017). Noting the resemblance to the independent, flexible, and high skilled workers that Standing (2011) describes as 'Proficians', Van Aerden et al. deemed this group as *'portfolio'* employment, which we also adopt.

The third category consists of jobs with a similarly high probability of several positive EQ attributes seen in portfolio jobs, including high income, opportunity to develop, and involvement in decision-making. However, this employment type has the highest levels of working long hours, irregular shifts, and being subjected to mandatory extra work hours, even though they have high union representation. These jobs also have very low schedule control, and a somewhat higher probability of being in a non-permanent arrangement, experiencing workplace harassment, and lacking necessary information and equipment. In other words, these jobs seem to be distinguished by requiring a high level of skill— which translates to high wages, opportunity for advancement, and involvement—and very inflexible and excessively long working time arrangements. This cluster, which represent 15 percent of wage-earning workers and 13 percent of the total workforce, is therefore labeled as *'inflexible skilled'*.

The fourth category is made up of permanent, full-time arrangements with high union representation, and middle-to-high wages, similar to the inflexible skilled jobs, but is characterized by several other negative employment conditions. These jobs are likely to have long hours, mandatory extra work hours, and irregular shifts, and score very poorly

on the following indicators: control over schedule, employee involvement, opportunity for development, having necessary information and equipment to do job, and experiencing harassment at work. Thus, while these jobs seem to be stable, they also have imbalanced power dynamics that may contribute to adverse employment experiences, including little opportunity for advancement or involvement. This group is therefore labeled as *'dead-end'*. *Dead-end* jobs represent 14 percent of wage earners and 12 percent of the total workforce.

The fifth and sixth clusters are similar across several EQ dimensions, and are distinguished from the previous four employment types by being the farthest from the historical conception of standard employment in character. In particular, these clusters have the highest probabilities of low wages, non-full-time hours, irregular shifts, and being in a non-permanent employment contract, as well as low probabilities of union representation. However, these two highly de-standardized employment types diverge distinctly across indicators of opportunity, schedule flexibility, employee involvement, workplace harassment, and having necessary information and equipment. The fifth cluster resembles an accumulation of all poor EQ attributes: it is characterized by low wages, with irregular shifts, little opportunity for advancement, low schedule control, and poor worker-employer relations. This job type conforms well to the concept of precarious employment (Benach et al., 2014; Julià et al., 2017; Standing, 2011), and is thusly labeled *'precarious'*. *Precarious* jobs represent 13 percent of wage earners and 11 percent of the total workforce. The sixth employment type resembles highly non-standardized employment, but with substantial schedule flexibility, and higher levels of involvement in decision-making and opportunity for advancement. This employment type is therefore labeled *'optimistic precarious'*. Similar to the *precarious* employment type, this group represents 13 percent of wage earners and 11 percent of the total workforce.

Within self-employed workers, the two identified employment types are similar across several dimensions of EQ (Table 3). Not surprisingly, both consist primarily of workers who report working within non-permanent employment arrangement. They also have similarly high probabilities of irregular shifts, low union representation, and high availability of necessary information and equipment. Further, both clusters have very high scores on opportunity to develop and control over their schedule, and relatively low probability of experiencing harassment. However, these two groups are very different across wages, hours, and employee involvement. One cluster, similar to the portfolio type, has very high income, with long and excessive work hours, and high involvement in decision-making. These jobs, although non-permanent, resemble a highly skilled, flexible, and independent workforce, and are labeled *'skilled contractor'*. This group represents 40 percent of self-employed and 5 percent of the total workforce. The final cluster is characterized by low income, low hours, and low employee involvement. These jobs seem to be the least stable of all of the employment categories—having the highest proportion of non-permanent arrangements and irregular shifts—suggesting workers in this group are engaged in short-term or time-defined jobs. The final group is therefore labeled *'job-to-job'*. This employment type represents 60 percent of self-employed and 8 percent of the total workforce.

### 4.3. Sociodemographic and labor market-related correlates of employment quality

Multinomial logistic regression results find our employment typology is associated with all five sociodemographic measures, suggesting substantial social segmentation of EQ within the U.S. labor market. Multivariate analyses are shown in Tables 4 and 5; univariate analyses provided similar results (not shown), suggesting that social sorting of workers into different employment types occurs independently across multiple sociodemographic characteristics. Compared to those in *SER-like* jobs (the referent group), workers in the *portfolio* category are disproportionately older, non-Black men with high education levels. Men are also over-represented in *inflexible skilled* and *dead-end* groups, although these groups differ in terms of educational attainment—*inflexible skilled* workers have comparatively more than the SER-like group, while *dead-end* workers have similar levels. The *dead-end* group also contains more foreign-born workers. The *precarious* cluster is markedly younger and lower educated, as well as having more women and American Indian/Alaskan Native workers. The *optimistic precarious* has a somewhat bimodal age distribution, with less middle-aged workers, as well as more workers with less than high school education. Compared to the *job-to-job* category within the self-employed sample, *skilled contractors* are disproportionately older White men with higher education.

We also find evidence that employment patterns are unevenly distributed across the labor market (Table 6). In terms of occupation, a general pattern emerges in which *portfolio* employment is over-represented in management and business occupations, while *precarious* and *optimistic precarious* groups are more common in service occupations. Additionally, *dead-end* employment is more likely to occur in production and transportation-related occupations, while *inflexible skilled* workers are over-represented in military occupations. Analysis of industry shows a generally similar pattern. *Portfolio* jobs are more likely within professional, technical, and financial sectors, while *precarious* and *optimistic precarious* employment types are more likely in service and retail sectors. *Dead-end* employment is more likely to occur in transportation and manufacturing settings, while *inflexible skilled* employment is more common within resource extraction industries. Another pattern emerges with size of worksite: *dead-end* and *portfolio* jobs tend to occur within larger workplaces, while *optimistic precarious* employment is associated with small worksites. Differences in labor market-related variables were less clear among the self-employed, although s*killed contractors* are less likely to work in service-related occupations and industries compared to *job-to-job* workers.

## 5. DISCUSSION

In this study, we investigate the character of employment arrangements in the modern U.S. labor market, presenting a typology comprised of eight distinct forms of employment. One employment type resembles the historical conception of the SER model, while the others represent various constellations of favorable and adverse employment features. Employment types are unevenly distributed across society, in terms of who works these jobs and where they are found in the labor market.

A primary contribution of this study is identifying the substantial heterogeneity in the structure and distribution of modern employment relationships—a finding that aligns with

several recent studies (Doerflinger et al., 2020; Gevaert et al., 2020; Lukac et al., 2019; Van Aerden et al., 2014; Yoon & Chung, 2016). Anchoring our analysis within a broad view of the SER concept, we find evidence that the 'de-standardization' of employment has likely occurred along several different paths. In our view, the EQ framework provides advantage over narrow conceptualizations of employment and job quality that have focused on non-permanent contracts or wage levels. In particular, our typology shows the importance of relational dimensions of employment, which are much less considered in quantitative analyses. It is illustrative, for example, to consider that *dead-end* employment looks similar to *SER-like* employment across wages, hours, and contract status—and would likely be categorized together within analyses using solely such metrics. But, in fact, our results suggest that these are two very different forms of employment, diverging substantially in regard to opportunities to develop skills and proxy indicators of collective and interpersonal power relations. In other words, a critical benefit of typological measurement is that it allows for identification of more complex combinations of employment features compared to approaches using dichotomous or gradational measures. Further, our study reveals limitations associated with binary conceptions of standard vs. non-standard employment, or insider-outsider dichotomies envisioned within dual labor market theories.

Another contribution is our focus on the U.S. context. To our knowledge, we are the first to apply typological measurement to a nuanced, multidimensional conceptualization of EQ in the U.S. A recent study by Cho (2020) used the U.S. GSS dataset and LCA to examine patterns of precarious employment; however, this study used primarily subjective indicators of employment precariousness, such as perceived risk of job loss or fairness of wages. Cho found four patterns of precarious employment experience, which were associated with workers' sociodemographic profiles and health statuses (Cho, 2020). In contrast to Cho, we have theorized the subjective experiences of precariousness as being on the causal pathway between actual conditions of the employment relationship and workers' health (see Peckham et al., 2019). Thus, while the Cho study supports the importance of employment relations as a determinant of health, as well as the value of typological measurement approaches, it is limited with respect to our primary goal of characterizing empirical patterns of existing employment conditions in the modern U.S. labor market. Some of EQ types described here are also similar to those identified in a recent study from our research group that used a sequence analysis approach to examine EQ trajectories among U.S. workers (i.e., a typological measurement approach applied to longitudinal data) (Eisenberg-Guyot et al., 2020). In particular, employment trajectories that are conceptually similar to the *SER-like* and *precarious* employment EQ types described here were identified in both men and women, and a trajectory resembling the *portfolio* EQ type was identified among men (Eisenberg-Guyot et al., 2020). The similar results in analyses from distinct datasets, with different time scales and proxy indicators of EQ, suggest these archetypes may be useful in conceptualizing employment patterns in the U.S. Our approach also allows for a thorough comparison to prior E.U. studies, described below, which shows that, indeed, patterns of employment differ in the U.S. context.

A third contribution is our inclusion of the self-employed in our analysis. These workers make up approximately 10% of the U.S. workforce (Hipple & Hammond, 2016) and 15% of the European labor market (Eurostat, 2018), yet have largely been excluded from analyses

mentioned herein. We find that self-employment in the U.S. can take two different forms, as measured using the EQ framework. The *skilled contractor* and *job-to-job* employment types differ primarily along dimensions of wages, hours, and involvement in decision-making; however, based on our modeling, other EQ indicators do not seem to possess much predictive power to help distinguish between-group differences. For instance, response patterns for both *skilled contractor* and *job-to-job* employment types were similar to the self-employed sample averages across the following indicators: work shift, opportunity to develop, adequate information, union representation, schedule control, and workplace harassment. On the other hand, the overall self-employed sample differed substantially on these measures compared to wage earners—especially having much higher probability of development opportunity, schedule control, and irregular shifts. It is likely that these survey items are picking up different information across the two workforces—our rationale for modeling these groups separately.

However, it is reasonable to question whether the EQ framework, as operationalized here, is optimal for characterizing self-employment. A recent study by Gevaert et al. (2020) similarly focused on constructing a typology of EQ within both wage earners and self-employed using data from the 2015 European Working Conditions Survey (EWCS). Rather than using the same proxy indicators of EQ for both classes of workers, however, these researchers used separate sets of items, including one meant to more specifically characterize the conditions of self-employment. With these additional items from the EWCS—including, for example, number of clients, number of employees, and whether individuals were self-employed by preference—they identified five distinct forms of self-employment (Gevaert et al., 2020). In another approach, Florin and Pichault (2020) used a novel conceptualization of autonomy among the self-employed and a cluster analysis approach in the same EWCS data, finding four types that varied across measures of voluntariness, economic dependence on certain clients, and control over work content and conditions. Inclusion of such information may have allowed us to better differentiate labor market experiences within this population. For example, an examination of the number of employees among self-employed workers in our data suggests that *skilled contractors* have on average 5 employees, while *job-to-job* have on average 1 employee (with a median of 1 and 0, respectively; data not shown). Further, our finding of comparatively higher levels of model misfit based on BVRs in the self-employed likewise supports the need to identify U.S. data sources that more specifically characterize this population. Nevertheless, our results generally show heterogeneity within the self-employed population, and highlight the need for further attention to understanding their labor conditions.

Our study also identifies an association between EQ and social inequities, finding that especially gender, education, and age are associated with differential employment experiences in the U.S. Scholars have long acknowledged that the history of race-, class-, and gender-based exclusions from the labor market, among others, have resulted in White men disproportionately occupying high quality employment (Andrea et al., 2021; Hudson, 2007; Oddo et al., 2020; Puig-Barrachina et al., 2014). This is consistent in our results, most notably in the stark differences in the sociodemographic profiles of p*ortfolio* compared to *precarious* and *optimistic precarious* employment types. Given that employment is a critical element of individual (and family) well-being—for example, as a primary determinant of

economic security, ability to transition to adulthood, and overall life satisfaction (Kalleberg, 2018)—EQ is implicated as a potential mechanism by which social inequities are produced and reinforced within modern societies.

## 5.1. Comparison with European Studies

By following the approach of Van Aerden et al. (2014, 2016, 2017), we are able to make some methodological and substantive comparisons to their analyses of the European labor market. From a methodological perspective, our findings lend support to the validity and value of the overall approach. Importantly, using another data source and different proxy indicators of EQ, we likewise found that EQ features cluster together into interpretable employment types, and that these types are correlated with sociodemographic and labor market-related indicators. It is particularly notable that we find employment types in the U.S. that resemble the *SER-like*, *portfolio*, and *precarious* groups identified by Van Aerden and colleagues—and, more recently, by Gevaert et al. (2020). A thorough examination of our respective analyses reveal some minor variations that may in part reflect the differing structure of the labor market in the US compared to the EU. *SER-like* employment in our sample has lower income levels, lower levels of employee representation (likely reflecting lower overall unionization in the U.S.), as well as lower rates of harassment within the workplace, compared to the E.U. studies. Further, we find that more women are engaged in *SER-like* employment in the U.S., whereas the opposite was found in the E.U. data. Nevertheless, each of the analyses found roughly 25–30 percent of wage-earners are engaged in *SER-like* employment arrangements, and the overall similarity in character provides some support for the SER concept as a useful conceptual benchmark across national contexts. Similarly, some minor differences exist between the *precarious* and *portfolio* employment types seen in the U.S. vs. E.U. analyses (e.g., U.S. portfolio workers have more control over their schedules). However, these groups largely overlap in both datasets, and provide conceptual bookends for high and low road versions of non-standard employment.

Yet our analysis suggests a different overall patterning of EQ in the U.S. compared to Europe. For example, the *dead-end* cluster identified in our sample has some similarities to the 'instrumental' employment type identified by Van Aerden and colleagues; however, this U.S.-specific cluster has significantly more hours and an overall worse pattern of scores across relational EQ measures. They also experience the highest levels of harassment, have the lowest opportunity to develop, and report not having enough information and equipment to get their work done—all of which point to very low commitment from employers. Surprisingly, the *dead-end* group has relatively high levels of union representation. Thus, these workers appear to be positioned within the core workforce of an organization, but perhaps with few opportunities to move elsewhere (Kalleberg, 2003). The *optimistic precarious* cluster, which our model estimates as approximately one in every six wage earners in the U.S., was not found in the E.U. analyses. This employment type represents a highly non-standard form of employment from a contractual perspective (i.e., non-permanent contract, low wages, low hours); however, they report rather favorable power relations, with high levels of control and involvement, as well as optimism in terms of their opportunity to develop abilities. Thus, workers in this group may be engaged in these jobs

voluntarily, consistent with the notion that aspects of so-called non-standard employment may be beneficial to some workers (and, perhaps, our inclusion of the label of 'precarious' is inappropriate for this group). Indeed, in our prior epidemiologic analysis of EQ in the U.S. we found that the physical and mental health of the *optimistic precarious* group was no different than *SER-like* employment (Peckham et al., 2019). This aligns with warnings from scholars against the valorization of the SER model as the highest quality employment, or the conditioning of social protections on such a model (Vosko 2008). Indeed, there are many reasons why an individual might prefer a job that deviates from the SER-like model; for example, circumstances such as care responsibilities or disability status could make it difficult to work permanent jobs or full-time hours. However, we believe that our findings support the idealized conception SER as a useful point of departure by which to understand the heterogeneity of modern employment arrangements.

## 5.2. Limitations

Several important limitations of our analysis should be noted. First, we are limited by the cross-sectional nature of our data. As a result, our intention is that the presented regression analyses be interpreted as primarily descriptive. That said, there is strong theoretical rationale that sociodemographic characteristics are antecedent of one's employment situation. Another data-related issue is the fact that our typology is based on secondary data. While we attempted to identify appropriate proxy indicators, these measures were not intended specifically to capture the EQ construct. Our finding of large BVRs suggests further research is warranted to identify reliable indicators of this construct in the U.S. context. Relatedly, the GSS QWL module lacks information on some important dimensions of EQ. In particular, there is no objective information on whether workers receive employer-provided fringe benefits, which is particularly important in the U.S. context. Additional measures related to workers' access to (and ability to benefit from) rights and social protections, opportunity to enhance skills, and worker-employer power relations would also strengthen the comprehensiveness of an empirical employment typology. Further, our classification of the self-employed working population would have benefited from additional indicators that are more relevant to the specific character and experience of self-employment, as was recently demonstrated in Gevaert et al. (2020). However, overall, this dataset is a significant strength of this analysis, being among the richest sources of information on EQ characteristics among U.S. workers and allowed for a similar operationalization of EQ as conducted in prior research.

## 6. CONCLUSION

To conclude, our analyses suggest much more substantial segmentation of the U.S. labor market than can be captured by simplistic notions of standard vs. non-standard employment. Importantly, divisions in labor market experiences are driven by both contractual and relational features of employment. Improving our understanding of ongoing labor market trends affecting employment relations will require contending with the complex and heterogeneous nature of modern employment.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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**Table 1.**

Comparison of model fit indices in LCA modeling of wage-earning and self-employed working populations.

| Classes | Log likelihood | Parameters | AIC | AIC | BIC | BIC | VLMR-LRT | Entropy |
|---------|---------------|------------|------|------|------|------|----------|---------|
| *Wage earner sample* | | | | | | | | |
| 1 | −49517 | 19 | 99072 | -- | 99200 | -- | -- | -- |
| 2 | −48525 | 39 | 97129 | 1943 | 97393 | 1807 | 0 | 0.53 |
| 3 | −47969 | 59 | 96056 | 1073 | 96455 | 938 | 0 | 0.58 |
| 4 | −47765 | 79 | 95687 | 369 | 96222 | 233 | 0 | 0.56 |
| 5 | −47635 | 99 | 95467 | 220 | **96137** | 85 | **0** | 0.55 |
| 6 | −47553 | 119 | 95343 | 124 | 96148 | −11 | 0.78 | 0.55 |
| 7 | −47489 | 139 | 95256 | 87 | 96196 | −48 | 0.79 | 0.57 |
| 8 | −47443 | 159 | **95204** | 52 | 96279 | −83 | 0.76 | 0.58 |
| *Self-employed sample* | | | | | | | | |
| 1 | −7028 | 19 | 14094 | -- | 14186 | -- | -- | -- |
| 2 | −6849 | 39 | 13776 | 318 | **13966** | 220 | **0** | 0.63 |
| 3 | −6786 | 59 | 13690 | 86 | 13978 | −12 | 0.76 | 0.69 |
| 4 | −6746 | 79 | 13649 | 41 | 14035 | −57 | 0.84 | 0.73 |
| 5 | −6711 | 99 | 13621 | 28 | 14104 | −69 | 0.83 | 0.64 |
| 6 | −6678 | 119 | **13593** | 28 | 14175 | −71 | 0.77 | 0.72 |

Notes: AIC: Akaike Information Criteria. BIC: Bayesian Information Criteria. VLMR-LRT: Vuong-Lo-Mendell-Rubin likelihood ratio test (p-value shown). Bolding denotes number of classes recommended by each fit indices.

**Table 2.**

Conditional item response probabilities across employment types identified in wage earners.

| EQ indicator | Response category | Sample proportion | SER | Portfolio | Inflexible skilled | Dead-end | Precarious | Optimistic precarious |
|---|---|---|---|---|---|---|---|---|
| | Cluster size | | 0.28 | 0.17 | 0.15 | 0.14 | 0.13 | 0.13 |
| **Employment contract** | | | | | | | | |
| | Reg/permanent | 0.891 | 0.939 | 0.953 | 0.887 | 0.943 | 0.855 | 0.690 |
| | Non-permanent | 0.109 | 0.061 | 0.047 | 0.113 | 0.057 | 0.145 | 0.310 |
| **Income** | | | | | | | | |
| | Lowest income quartile | 0.274 | 0.170 | 0.026 | 0.115 | 0.074 | 0.797 | 0.779 |
| | 2nd/3rd income quartile | 0.530 | 0.718 | 0.427 | 0.599 | 0.785 | 0.203 | 0.189 |
| | Highest income quartile | 0.196 | 0.112 | 0.547 | 0.286 | 0.141 | 0.000 | 0.033 |
| **Mandatory days of extra work hours** | | | | | | | | |
| | None | 0.798 | 0.851 | 0.849 | 0.572 | 0.682 | 0.846 | 0.965 |
| | 1–10 days | 0.139 | 0.149 | 0.090 | 0.220 | 0.188 | 0.133 | 0.035 |
| | 11+ days | 0.063 | 0.000 | 0.061 | 0.208 | 0.130 | 0.021 | 0.000 |
| **Working hours** | | | | | | | | |
| | <24 hrs | 0.104 | 0.014 | 0.012 | 0.039 | 0.027 | 0.201 | 0.478 |
| | 25–36 hrs | 0.135 | 0.104 | 0.034 | 0.060 | 0.029 | 0.327 | 0.347 |
| | 37–48 hrs | 0.503 | 0.847 | 0.443 | 0.231 | 0.624 | 0.426 | 0.107 |
| | >48 hrs | 0.258 | 0.035 | 0.511 | 0.671 | 0.319 | 0.046 | 0.067 |
| **Working times regularity** | | | | | | | | |
| | Day shift | 0.732 | 0.855 | 0.941 | 0.612 | 0.710 | 0.533 | 0.562 |
| | Afternoon/night shift | 0.123 | 0.080 | 0.000 | 0.119 | 0.161 | 0.291 | 0.169 |
| | Split/irregular/rotating | 0.145 | 0.065 | 0.059 | 0.270 | 0.129 | 0.176 | 0.269 |
| **Opportunity to develop abilities** | | | | | | | | |
| | Very true | 0.352 | 0.357 | 0.582 | 0.544 | 0.040 | 0.139 | 0.370 |
| | Somewhat true | 0.443 | 0.552 | 0.382 | 0.420 | 0.376 | 0.380 | 0.453 |
| | Not true | 0.205 | 0.091 | 0.036 | 0.036 | 0.584 | 0.482 | 0.176 |
| **Have adequate training, info, equipment** | | | | | | | | |
| | Often/sometimes have | 0.869 | 0.955 | 0.925 | 0.907 | 0.562 | 0.804 | 0.967 |
| | Rarely/never have | 0.131 | 0.045 | 0.075 | 0.093 | 0.438 | 0.196 | 0.033 |
| **Union representation** | | | | | | | | |
| | Union member | 0.147 | 0.139 | 0.042 | 0.277 | 0.272 | 0.098 | 0.053 |
| | Not union member | 0.853 | 0.861 | 0.958 | 0.723 | 0.728 | 0.902 | 0.947 |
| **Control over schedule** | | | | | | | | |
| | High control | 0.322 | 0.305 | 0.726 | 0.131 | 0.143 | 0.068 | 0.509 |
| | Medium control | 0.377 | 0.456 | 0.265 | 0.411 | 0.338 | 0.332 | 0.401 |
| | Low control | 0.301 | 0.239 | 0.009 | 0.458 | 0.518 | 0.600 | 0.090 |
| **Employee involvement** | | | | | | | | |
| | Often involved | 0.388 | 0.382 | 0.630 | 0.575 | 0.168 | 0.170 | 0.323 |

| EQ indicator | Response category | Sample proportion | SER | Portfolio | Inflexible skilled | Dead-end | Precarious | Optimistic precarious |
|---|---|---|---|---|---|---|---|---|
| | Sometimes involved | 0.390 | 0.479 | 0.313 | 0.319 | 0.400 | 0.335 | 0.427 |
| | Rarely/never involved | 0.222 | 0.139 | 0.057 | 0.106 | 0.432 | 0.495 | 0.250 |
| **Workplace harassment/threats** | | | | | | | | |
| | Yes harassment/threat | 0.111 | 0.080 | 0.041 | 0.168 | 0.208 | 0.170 | 0.036 |
| | No harassment/threat | 0.889 | 0.920 | 0.959 | 0.832 | 0.792 | 0.830 | 0.964 |

Source: General Social Survey (years 2002, 2006, 2010, 2014, 2018)

**Table 3.**

Conditional response probabilities across employments types identified in self-employed.

| EQ indicator | Response category | Sample proportion | Job-to-job | Skilled contractor |
|---|---|---|---|---|
| | Cluster size | | 0.60 | 0.40 |
| **Employment contract** | | | | |
| | Reg/permanent | 0.182 | 0.099 | 0.307 |
| | Non-permanent | 0.818 | 0.901 | 0.693 |
| **Income** | | | | |
| | Lowest income quartile | 0.328 | 0.530 | 0.050 |
| | 2nd/3rd income quartile | 0.355 | 0.350 | 0.362 |
| | Highest income quartile | 0.317 | 0.120 | 0.589 |
| **Mandatory days of extra work hours** | | | | |
| | None | 0.765 | 0.871 | 0.607 |
| | 1–10 days | 0.154 | 0.114 | 0.215 |
| | 11+ days | 0.080 | 0.015 | 0.179 |
| **Working hours** | | | | |
| | <24 hrs | 0.209 | 0.348 | 0.000 |
| | 25–36 hrs | 0.171 | 0.240 | 0.066 |
| | 37–48 hrs | 0.260 | 0.250 | 0.275 |
| | >48 hrs | 0.361 | 0.162 | 0.659 |
| **Working times regularity** | | | | |
| | Day shift | 0.637 | 0.585 | 0.715 |
| | Afternoon/night shift | 0.032 | 0.054 | 0.000 |
| | Split/irregular/rotating | 0.331 | 0.361 | 0.285 |
| **Opportunity to develop abilities** | | | | |
| | Very true | 0.674 | 0.592 | 0.795 |
| | Somewhat true | 0.241 | 0.265 | 0.205 |
| | Not true | 0.085 | 0.142 | 0.000 |
| **Have adequate training, info, equipment** | | | | |
| | Often/sometimes have | 0.937 | 0.911 | 0.974 |
| | Rarely/never have | 0.063 | 0.089 | 0.026 |
| **Union representation** | | | | |
| | Union member | 0.030 | 0.029 | 0.031 |
| | Not union member | 0.970 | 0.971 | 0.969 |
| **Control over schedule** | | | | |
| | High control | 0.629 | 0.672 | 0.565 |
| | Medium control | 0.270 | 0.237 | 0.320 |
| | Low control | 0.101 | 0.091 | 0.115 |
| **Employee involvement** | | | | |
| | Often involved | 0.439 | 0.320 | 0.617 |
| | Sometimes involved | 0.256 | 0.264 | 0.245 |
| | Rarely/never involved | 0.304 | 0.416 | 0.138 |

| EQ indicator | Response category | Sample proportion | Job-to-job | Skilled contractor |
|---|---|---|---|---|
| **Workplace harassment/threats** | | | | |
| | Yes harass/threat | 0.074 | 0.074 | 0.075 |
| | No harass/threat | 0.926 | 0.926 | 0.925 |

Source: General Social Survey (years 2002, 2006, 2010, 2014, 2018)

**Table 4.**

Sociodemographic predictors of employment cluster membership among wage earners (n = 6,367).

| | SER-like | Portfolio | | | Inflexible Skilled | | | Dead End | | | Precarious | | | Optimistic Precarious | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (base class) | AOR | AOR | 95% CI | p | AOR | 95% CI | p | AOR | 95% CI | p | AOR | 95% CI | p | AOR | 95% CI | p |
| **Age** | | | | | | | | | | | | | | | | |
| 30 and under | (ref.) | (ref.) | | | (ref.) | | | (ref.) | | | (ref.) | | | (ref.) | | |
| 31–50 | | 2.15 | (1.29–3.58) | ** | 0.98 | (0.67–1.45) | | 1.15 | (0.72–1.82) | | 0.37 | (0.26–0.54) | *** | 0.33 | (0.22–0.49) | *** |
| Over 50 | | 2.72 | (1.56–4.74) | *** | 0.68 | (0.43–1.08) | | 1.34 | (0.82–2.21) | | 0.22 | (0.13–0.37) | *** | 0.81 | (0.55–1.18) | |
| **Gender** | | | | | | | | | | | | | | | | |
| Men | | (ref.) | | | (ref.) | | | (ref.) | | | (ref.) | | | (ref.) | | |
| Women | | 0.12 | (0.08–0.18) | *** | 0.31 | (0.22–0.43) | *** | 0.42 | (0.30–0.58) | *** | 1.99 | (1.35–2.93) | ** | 1.42 | (0.99–2.04) | + |
| **Race/ethnicity** | | | | | | | | | | | | | | | | |
| White | | (ref.) | | | (ref.) | | | (ref.) | | | (ref.) | | | (ref.) | | |
| Black | | 0.32 | (0.16–0.64) | ** | 0.77 | (0.51–1.15) | | 0.79 | (0.52–1.22) | | 1.14 | (0.75–1.74) | | 0.68 | (0.43–1.06) | + |
| Hispanic | | 0.68 | (0.32–1.43) | | 0.99 | (0.57–1.74) | | 0.84 | (0.45–1.59) | | 1.36 | (0.83–2.24) | | 0.88 | (0.52–1.49) | |
| Asian/Pacific Is. | | 1.29 | (0.41–4.03) | | 1.12 | (0.36–3.48) | | 0.29 | (0.04–2.06) | | 1.70 | (0.44–6.67) | | 1.05 | (0.38–2.85) | |
| AI/AN | | -- | | | 1.43 | (0.29–6.92) | | 1.81 | (0.47–6.95) | | 3.25 | (1.11–9.53) | * | 1.06 | (0.21–5.29) | |
| **Nativity** | | | | | | | | | | | | | | | | |
| Born in U.S. | | (ref.) | | | (ref.) | | | (ref.) | | | (ref.) | | | (ref.) | | |
| Foreign born | | 0.61 | (0.30–1.23) | | 0.83 | (0.44–1.55) | | 2.02 | (1.07–3.81) | * | 1.28 | (0.75–2.17) | | 0.98 | (0.56–1.71) | |
| **Education** | | | | | | | | | | | | | | | | |
| Less than high school | | 0.08 | (0.00–52.56) | | 1.17 | (0.66–2.07) | | 0.78 | (0.42–1.46) | | 2.29 | (1.39–3.77) | ** | 2.26 | (1.34–3.80) | ** |
| High school | | (ref.) | | | (ref.) | | | (ref.) | | | (ref.) | | | (ref.) | | |
| Junior college | | 1.76 | (0.92–3.36) | + | 1.22 | (0.74–2.01) | | 0.77 | (0.45–1.31) | | 0.25 | (0.10–0.65) | ** | 0.82 | (0.49–1.36) | |
| Bachelor | | 6.06 | (3.81–9.63) | *** | 1.30 | (0.85–2.00) | | 0.95 | (0.61–1.48) | | 0.20 | (0.09–0.43) | *** | 0.71 | (0.45–1.12) | |
| Graduate | | 14.05 | (7.62–25.92) | *** | 3.81 | (2.23–6.52) | *** | 1.51 | (0.79–2.89) | | -- | | | 0.62 | (0.31–1.23) | |

Notes: Results of multinomial logistic regression are reported as adjusted odds ratios (AOR), in which all variables are mutually adjusted.

+ p-value < 0.1

* p-value < 0.05

** p-value < 0.01

***
p-value < 0.001.

AI/AN: American Indian/Alaskan Native. Source: General Social Survey (years 2002, 2006, 2010, 2014, 2018)

**Table 5.**

Sociodemographic predictors of employment cluster membership among the self-employed (n = 977).

| | Job-to-job | Skilled Contractor | | |
|---|---|---|---|---|
| | (base class) | AOR | 95% CI | p |
| **Age** | | | | |
| 30 or under | | (ref.) | | |
| 31–50 | | 4.00 | (1.23–12.99) | * |
| Over 50 | | 4.38 | (1.37–14.02) | * |
| **Gender** | | | | |
| Men | | (ref.) | | |
| Women | | 0.13 | (0.07–0.23) | *** |
| **Race/ethnicity** | | | | |
| White | | (ref.) | | |
| Black | | 0.30 | (0.09–0.98) | * |
| Hispanic | | 0.36 | (0.13–1.01) | + |
| Asian/Pacific Is. | | 0.53 | (0.11–2.58) | |
| AI/AN | | 0.69 | (0.18–2.60) | |
| **Nativity** | | | | |
| Born in U.S. | | (ref.) | | |
| Foreign born | | 0.81 | (0.28–2.37) | |
| **Education** | | | | |
| Less than high school | | 0.45 | (0.18–1.10) | + |
| High school | | (ref.) | | |
| Junior college | | 1.02 | (0.38–2.71) | |
| Bachelor | | 2.11 | (1.16–3.84) | * |
| Graduate | | 1.32 | (0.59–2.96) | |

Notes: Results of multinomial logistic regression are reported as adjusted odds ratios (AOR), in which all variables are mutually adjusted. AI/AN: American Indian/Alaskan Native.

+
p-value < 0.1

*
p-value < 0.05

**
p-value < 0.01

***
p-value < 0.001.

Source: General Social Survey (years 2002, 2006, 2010, 2014, 2018)

**Table 6.**

Mean probabilities of employment cluster membership across labor market-related covariates.

| | Wage earners | | | | | | Self-employed | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | SER | Portfolio | Inflexible Skilled | Dead-end | Precarious | Optimistic precarious | Job-to-job | Skilled contractor |
| Cluster size | 0.278 | 0.170 | 0.150 | 0.141 | 0.130 | 0.129 | 0.600 | 0.400 |
| **Occupation** | | | | | | | | |
| Management, business, and financial operations | 0.278 | 0.372 | 0.152 | 0.114 | 0.033 | 0.051 | 0.473 | 0.527 |
| Professional and related | 0.302 | 0.211 | 0.187 | 0.122 | 0.070 | 0.108 | 0.615 | 0.385 |
| Service occupations | 0.231 | 0.064 | 0.137 | 0.122 | 0.239 | 0.207 | 0.814 | 0.186 |
| Sales and office occupations | 0.309 | 0.141 | 0.106 | 0.151 | 0.155 | 0.138 | 0.530 | 0.470 |
| Natural resources, construction, and maintenance | 0.299 | 0.152 | 0.195 | 0.161 | 0.087 | 0.106 | 0.599 | 0.401 |
| Production, transportation, and material moving | 0.234 | 0.087 | 0.184 | 0.222 | 0.169 | 0.104 | 0.621 | 0.379 |
| Military specific occupations | 0.256 | 0.233 | 0.307 | 0.156 | 0.026 | 0.022 | -- | -- |
| **Industry** | | | | | | | | |
| Agriculture/forestry/fishing/hunting & extraction/utilities | 0.261 | 0.164 | 0.245 | 0.154 | 0.080 | 0.095 | 0.481 | 0.519 |
| Construction | 0.312 | 0.178 | 0.188 | 0.120 | 0.082 | 0.121 | 0.506 | 0.494 |
| Manufacturing | 0.270 | 0.207 | 0.161 | 0.194 | 0.117 | 0.051 | 0.592 | 0.408 |
| Wholesale and retail trade | 0.244 | 0.139 | 0.125 | 0.139 | 0.189 | 0.164 | 0.536 | 0.464 |
| Transportation | 0.233 | 0.112 | 0.191 | 0.248 | 0.117 | 0.098 | 0.699 | 0.301 |
| Information & Financial activities | 0.315 | 0.250 | 0.132 | 0.135 | 0.069 | 0.098 | 0.490 | 0.510 |
| Professional and technical services | 0.276 | 0.333 | 0.123 | 0.111 | 0.061 | 0.096 | 0.579 | 0.421 |
| Admin/support & leisure/hospitality & other services | 0.242 | 0.108 | 0.127 | 0.104 | 0.219 | 0.199 | 0.739 | 0.261 |
| Education and health services | 0.309 | 0.137 | 0.164 | 0.132 | 0.123 | 0.137 | 0.655 | 0.345 |
| Public administration & active military | 0.301 | 0.212 | 0.211 | 0.178 | 0.053 | 0.046 | 0.586 | 0.415 |
| **Number of employees, worksite** | | | | | | | | |
| 1–9 | 0.257 | 0.153 | 0.134 | 0.086 | 0.151 | 0.219 | 0.636 | 0.364 |
| 10–49 | 0.288 | 0.149 | 0.135 | 0.138 | 0.144 | 0.145 | 0.442 | 0.558 |
| 50–499 | 0.279 | 0.164 | 0.174 | 0.161 | 0.128 | 0.094 | 0.513 | 0.487 |
| 500+ | 0.289 | 0.214 | 0.165 | 0.174 | 0.091 | 0.066 | 0.588 | 0.412 |

Source: General Social Survey (years 2002, 2006, 2010, 2014, 2018)