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ORIGINAL RESEARCH

# What are We Working For? Comparing the Importance of Job Features for Job Satisfaction over the Career Span

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## Abstract

This study examines the impact, relative importance, and unique predictive validity of changes in a host of job features and other relevant factors on job satisfaction over a 35-year period using data from the 1979 National Longitudinal Survey of Youth cohort (12,686 respondents). The design of our analysis eliminated of the impact of established between-person correlates of job satisfaction (e.g., personality, cognitive ability), thereby providing for direct examination of within-person change in the focal variables. Results using a first-difference regression and a relative weights analysis revealed that changes in intrinsic, social, and extrinsic features corresponded to changes in satisfaction, but with differing magnitudes. Specific features (e.g., different dimensions of the Job Characteristics Model) generally were unique predictors when all variables were considered. Findings regarding the importance of various features substantially deviate from employees' reports about contributors to job satisfaction and, in some cases, also differ from findings drawn from cross-sectional data.

**Keywords** Job satisfaction · Job characteristics · Longitudinal · Within-person

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## 1 Introduction

Imagine choosing among several new jobs. The jobs are identical except that each offers a different benefit. For instance, one offers more pay, another will provide more autonomy in how you structure your time and work, a third promises more prestige in the form of greater societal regard, and a fourth would allow you to work alongside a good friend. Which job would you choose and why?

Careers result from a series of such decisions about the impact of various job features and how they are valued. To the degree that people derive value from increasing their job satisfaction, they must decide which features of jobs are the best value and will confer such increases. Hence, the questions to answer are more fundamental; for instance "what types of changes make for a more satisfying job?" and "for which rewards are we working?" Of course, not everyone has the freedom to make occupational choices—lack of work-relevant skills and personal circumstance are common constraints for people seeking jobs. But, the significance of these questions is no less important here. Rather, given such barriers, the answers to these questions present ways organizations can design work and interventions improve well-being and create a more content workforce.

Behavioral science long has been interested in assisting organizations to "pull the right levers" to improve employee satisfaction and has produced a substantial amount of research about the impact of various job features on satisfaction (see Brief 1998; Judge et al. 2017; Warr 2007 for reviews). Whereas findings from cross-sectional and brief-timespan longitudinal studies document that satisfaction is affected by various intrinsic (e.g., social support; Humphrey et al. 2007) and extrinsic (e.g., pay; Judge et al. 2010) job features, little research has focused on which job features impact satisfaction over a person's long term career span. The handful of longer term longitudinal studies of job satisfaction examine the effect of one or two job features or other job-related factors on job satisfaction (e.g., Mohanty 2016, 2018; Zhou et al. 2017). Thus, to the best of our knowledge, there has not been a large-scale longitudinal investigation comparing the relative importance of a broad set of such features during careers.

In the current study, we seek to redress this omission by investigating the impact, relative importance, and unique predictive validity of a host of job features using a longitudinal dataset covering 35 years from a cross section of the American workforce; the National Longitudinal Survey of Youth 1979 cohort (NLSY79). We note that the analysis choices we made as well as the variables used in the present study are guided primarily by what was available from the NLSY79; our intention was thus primarily exploratory focusing on extracting what information we could from these data. Moreover, the approach we adopt in analyzing the NLSY79 allows for isolating within-person change in the job features and job satisfaction scores over time. Consequently, we answer a somewhat different question here than that addressed in most other relevant research. In the current study, we address how *changes* in each feature relate to *changes* in satisfaction. We elaborate on this approach and its intended contributions below.

### 1.1 The Relative Importance of Changes in Job Features on Changes in Job Satisfaction: An Application to the NLSY79 Data

Studies examining the antecedents of job satisfaction typically trade breadth for depth. For instance, many studies examine a single or a small set of job features and focusing on

developing theory relevant to that/those features (e.g., job characteristics model or JCM, Humphrey et al. 2007; dispositions, Thoresen et al. 2003). Not surprisingly then, reviews of the job satisfaction literature generally are organized around these specific approaches or variables (e.g., see Judge et al. 2017; Warr 2007). Whereas these findings undoubtedly provide the foundations of job satisfaction research, such investigations do not wholly capture the reality facing most people. That is, that all jobs vary along a wide range of dimensions and employees and job seekers must decide among the relative importance of these various factors in a more or less deliberate way.

In an attempt to provide a more holistic portrayal, we explore a host of job features potentially predictive of job satisfaction. Borrowing from Mottaz's (1985) and Humphrey et al.'s classifications (2007), we distinguish among three types of job features available on the NLSY79. Those job feature types are intrinsic, social, and extrinsic[1] types. Intrinsic job features refer to aspects of the work/task itself. In the current dataset, intrinsic job features include: autonomy, task identity, task feedback, task significance, and skill variety, as well as hours worked per day. Social features pertain to aspects of workplace relationships, operationalized here as workplace social interaction and workplace friendship. Finally, extrinsic features are tangible or otherwise externally visible aspects of the job; in this study, pay and prestige (Mottaz 1985, p. 366).

The NLSY79 also includes a number of other demographic (e.g., education) and career-related (e.g., tenure) factors that do not neatly fit into one of these three categories. As our goal was to be expansive, we also included these variables in the present analysis. These additional factors were job tenure, organization size, the number of jobs held, position changes, employment status, education, and depression.

Findings, including meta-analytic results, support the role of each of the job features in predicting job satisfaction when considered individually. By including a wide swath of job features in the same study, we are able to address the question of, "changes in which features are *more or less important* for changes in satisfaction?" From a practical perspective, knowing that a given feature (e.g., increased pay) will tend to yield higher satisfaction is different from knowing that the effect of increased pay likely would be outweighed by the contribution of one or more other job features (e.g., greater autonomy). To our knowledge, only a few studies have sought to compare the predictive validity of a broad set of factors (e.g., Agho et al. 1993; Mottaz 1985), and none has compared their within-person effects over the career-span.

The NLSY79 also provides for a comparison between what the data show as most important relative to what job holders believe to be most important when asked. Regarding job holders' beliefs, according to a recent survey of 600 American employees, "respectful treatment" is most important for job satisfaction (endorsed by 67% of respondents); compensation/pay is second most important (63%); and benefits rank third (60%; Society for Human Resource Management [SHRM] 2016). Features much further down in the rankings included: the work itself (ranked # 9 with 48% endorsing it), autonomy (ranked #11, 46%), and relationships with coworkers (#16, 40%). These rankings seem at odds with comparisons of meta-analytic estimates, which show that intrinsic job features (e.g., job characteristics; Humphrey et al. 2007) demonstrate stronger relationships with job satisfaction than do extrinsic ones (e.g., pay; Judge et al. 2010). Given the discrepancy, which set of rankings is correct?

[1] Mottaz referred to these as "organizational" rewards, but we felt the label "extrinsic" is more consistent with the job satisfaction literature.

Given the preponderance of empirical evidence from cross-sectional studies (e.g., Mottaz 1985; Warr 2007), our general expectation is that changes in the work itself (i.e., intrinsic) and in the social environment will be associated with more dramatic shifts in job satisfaction than will changes in extrinsic features. In fact, the greater impact of the former two categories may be especially pronounced here given the focus on within-person change. Because we suspect that changes in the task/intrinsic and social environment are more salient on an everyday basis (than those associated with pay and prestige; Weiss 2002), we would expect those deviations to have a more significant impact on short-term fluctuations in satisfaction (e.g., Lucas 2007). Formally, we offer the following research question:

Research Question: Are intrinsic and social job features more important predictors of job satisfaction than extrinsic job features?

Despite proposing this research question, we will not make other specific suggestions about the possible relative importance of specific features within these categories. In general, we approach this study in a more exploratory manner. As such, we see this analysis as representing a response to the call by Spector et al. (2014) for high quality, exploratory research that can provide a wealth of results that can be refined, confirmed, and extended theory in future research.

### 1.2 Examining the Potentially Unique Contribution of Changes in Job Features

Including a broad range of job features also allows for a second intended contribution –addressing which of these features *uniquely* accounts for changes in job satisfaction. In particular, we see three more specific topics related to incremental validity that our analysis can address. First, this investigation speaks to the degree to which changes in one set of factors predicts beyond changes in others. This would seem an important topic to address given that changes in the various features often are confounded (e.g., Luchman and Gonzalez-Morales 2013). Moving to a job with higher pay, for example, presumably will coincide with having more autonomy, thereby perhaps suggesting that changes in one or both factors do not uniquely account for increased job satisfaction.

Second, this analysis also can yield knowledge about the unique contributions of job features *within* a given category that may operate through similar mechanisms. For instance, given that skill variety and task significance both seem to impact satisfaction by increasing job-related meaning (e.g., Johns et al. 1992; Humphrey et al. 2007), changes in either of them may not uniquely relate to changes in satisfaction. Similarly, pay and prestige may fail to predict beyond one another insofar as both increase perceived self-worth and/or social standing (e.g., Hodge et al. 1964). We suspect that answers to these questions of incremental validity are of both theoretical and practical importance and our results may build future theory development.

Also related to the issue of incremental validity, the current approach provides information about the degree to which changes in specific job features may partly explain changes in the demographic variables also known to impact job satisfaction. Thus, for instance, this analysis can reveal whether the increase in job satisfaction associated with more education (e.g., Mottaz 1984) may be partly explained by corresponding changes in pay, prestige, and other job characteristics.

### 1.3 Examining Within-Person Change

In addition to making contributions regarding issues of incremental validity, we also seek to advance the job satisfaction literature by combining the longitudinal aspect of the current dataset with the current analytic approach. To date, the great majority of research on predictors of job satisfaction is cross-sectional or based on short-term longitudinal data. Dobrow and colleagues also noted the lack of long-term longitudinal data bearing on the predictors of job satisfaction, stating, "less than 4% of existing studies on age and job attitudes and almost none of the research about tenure and job satisfaction included measures of age, tenure, and job attitudes at more than one point in time" (Ng and Feldman 2010; as cited by Dobrow Riza et al. 2018, p. 2560). Furthermore, as those authors also note, studies making up that 4% generally follow workers for a short-time span (e.g., one or two years). The use of a cross-sectional design raises methodological concerns, potentially hindering the ability to make valid conclusions about the importance of changes in particular features (as we elaborate upon below). In contrast, the current archival dataset includes repeated measures of age, tenure and various other job features (and demographic variables) over 35 years.

Also of importance, our current analytical approach (making use of these repeated measures data) also allows for addressing different substantive questions than does most research on the predictors of job satisfaction. Cross-sectional studies addresses questions such as: "Are *people* who earn more money more satisfied than others?" or, "Are *people* whose jobs offer more autonomy, more variety, etc. especially satisfied?" In the current study, we can answer a different set of questions—those of how *change* in various job features relates to *changes* in job satisfaction. We are able to address these issues by disentangling within- from between-person variance, thereby isolating the effects of job features on satisfaction from the pre-existing characteristics of people on the job. We elaborate on this approach and its benefits below.

First, isolating within-person variance allows for examination of theoretical mechanisms at the appropriate level of analysis (see Curran and Bauer 2011). To illustrate this point, consider the evidence indicating that individuals whose job tasks are more significant enjoy higher job satisfaction than those whose tasks are less significant (Humphrey et al. 2007). According to both theory (Hackman and Oldham 1976) and findings (Fried and Ferris 1987), these effects occur because task significance helps fulfill a need for psychological growth. Important to note is that this explanation—of *growth* fulfillment—is fundamentally a within-person one; that is, as individuals enjoy greater task significance, their job satisfaction should increase relative to previous levels. Theories proposing somewhat different mechanisms (e.g., self-determination theory; Ryan and Deci 2000) also invoke within-person psychological explanations. However, tests of these theories almost universally entail correlating different people's ratings of task significance with those individuals' ratings of job satisfaction at the same time (see Humphrey et al. 2007). Thus, the theory in such studies cannot be directly and clearly supported by the methodology and corresponding analysis.

Related to this issue, cross-sectional ratings almost certainly reflect some degree of both between- and within-person variance. For instance, if some individuals in the sample recently began a new job (e.g., after leaving, or being promoted from one with less significant tasks), any effect of that recent, within-person change is captured in their ratings. Thus, the within- and any between-person effects are confounded, thereby obfuscating conclusions about the effects at the different levels (e.g., Chen et al. 2005).

Furthermore, even if one examined a sample of job incumbents whose job had never changed, those incumbents' ratings likely would capture various between-person differences that predict their objective and subjective job experiences. This is because various background factors and individual differences predict the types and characteristics of jobs that people select and obtain and their career-related experiences (Barsky et al. 2004; Judge et al. 2000). Owing to these psychological and sociological "selection" or "endowment" effects, relationships between the job attributes and ratings of job satisfaction partly reflect those background or dispositional characteristics. Isolating the unique effect of job experiences on changes in job satisfaction requires assessing changes in job satisfaction over time (e.g., as task significance changes—or does not). Again, cross-sectional research with an observational design likely will not provide accurate results about the effect of changes to the job on satisfaction. Below, we discuss our generally exploratory approach to analysis of the NLSY79 data to clearly isolate within-person change.

## 2 Method

### 2.1 Overview and Dataset

We used the United States Department of Labor's NLSY79 for survey years 1979–2014 (http://www.bls.gov/nls/nlsy79.htm). The NLSY79 began in 1979, tracking 12,686 individuals who were selected to represent a cross-section of the U.S. population. The NLSY79 is in a highly structured, approximately hour-long, annual or bi-annual interview format which has changing content between most interviews but a core set of questions asked every year. Most of these interviews were in-person, but some were conducted by telephone (less than 15% per year). We refer interested readers to the NLSY79 website for all details on survey methodology used including contacting respondents, question content, and methodological choices as well as changes to the survey over the years. In the present work, we focus on describing decisions we made regarding survey question selection and data preparation.

Before moving on, we note that the NLSY79 collects information about all employers for whom a respondent has worked in a time period. If a respondent had multiple jobs during a given time period, we used the current/most recent employer as denoted by the "Current Population Survey (CPS) job" for that respondent-year for all relevant questions/variables.

### 2.2 Measures

We examined three categories of job features: a) intrinsic, b) social and c) extrinsic. For most of the intrinsic and all social features each variables were collected in two survey years (1979 and 1982), and respondents made ratings for each variable using the same 5 point rating scale, ranging from 1 (minimum amount) to 5 (maximum amount). In the section below, we outline each question's wording.

#### 2.2.1 Intrinsic Job Features

Intrinsic job features included skill variety measured by the question: "How much opportunity does/did this job give you to do a number of different things?", task identity measured

by the question: "How much opportunity does/did this job give you to do a job from beginning to end?", autonomy measured by the question: "How much opportunity does/did this job give you for independent thought or action?", task significance measured by the question: "How much does/did your job give you the feeling that the job itself is/was very significant or important in the broader scheme of things?", and task feedback measured by the question: "How much does/did your job give you a feeling that you know whether or not you are performing your job well or poorly?"

Number of hours worked were, by contrast, measured by participants reporting the number of hours they worked per day. This question did not follow the one to five scaling followed by the other five intrinsic job featured and was measured in each survey year (i.e., not just in 1979 and 1982).

### 2.2.2 Social Job Features

Social job features included workplace friendship measured by the question: "How much opportunity does/did this job give you to develop close friendships in your job?" and social interaction measured by the question: "How much opportunity does/did this job give you to deal with other people?"

### 2.2.3 Extrinsic Job Features

Extrinsic job features included hourly pay and occupational prestige.

Hourly pay was computed by NLSY79 research staff using the respondent's work income and usual hours worked for their job. A brief outline of the hourly pay computation is available here: https://www.nlsinfo.org/content/cohorts/nlsy79/topical-guide/employment/wages. We adjusted all hourly pay data by the Consumer Price Index (see http://www.bls.gov/cpi/) to correspond to 2014 dollars to ensure across-year comparability. In addition, we added a single cent to hourly pay (to avoid logging 0) and computed the natural log of that value due to strong positive skew in the data.

Occupational prestige scores used here were based on the system developed by Hodge et al. (1964). Hodge and colleagues developed these scores by having respondents rate the "social standing" of each occupation via a nine-step ladder, with 1 being lowest social standing and 9 being highest. These ratings were then converted using the following formula so that prestige scores would range from 0 (lowest) to 100 (highest),

$$Prestige_j = \sum_i 12.5(i-1)\, X_{ij}$$

where $X_{ij}$ is the proportion of ratings received by $j$th occupation which fell on the $i$th rung on the prestige ladder, with rungs organized in ascending order. The resultant scores ranged from 9 ("bootblack/shoe shiner") to 86 ("surgeon"). Despite the seeming ambiguity and subjectivity of the prestige concept and rating process, prestige scores demonstrate remarkable agreement and very strong correlations across samples of respondents (including different countries), rating scales, and time periods (see Hauser and Warren 1997). Occupational prestige scores were appended to the data using three-digit occupation codes

associated with respondents' jobs as reported on the General Social Survey (obtained from http://gss.norc.org/documents/codebook/GSS_Codebook_AppendixF.pdf).[2]

### 2.2.4 Other Factors

Several other factors were included in the analysis such as job tenure, the size of the respondent's organization, the number of jobs held since the last interview, changes to the respondent's position since the last interview, the respondent's employment status, respondent's years of education, and depression.

Job tenure was operationalized as the number of weeks the respondent was employed at the job at the time of interview. One week was added to the tenure variable and scores then natural log-transformed for the analysis due to strong positive skew in the data.

Organization size represented the number of employees working at the respondent's firm. These data were not collected from 1981–1985. One employee was added to the size of employer variable for all respondents and the value was natural log-transformed for the analysis due to strong positive skew in the data.

Number of jobs since last interview was collected for each respondent. One job was added to the number of jobs and the value was natural log-transformed for the analysis due to strong positive skew in the data.

Position status referred to whether the respondent had a *position change*, *promotion*, *demotion* or *no change* at a job held since last survey. Position change was dummy coded with *no change* as the base category for analysis.

Employment or labor force status of respondent at time of survey during the last week for survey years was available for the years 1979–1998 and 2006. The recoded labor force status variable was used and is more comparable across years and has options: *employed*, *unemployed*, *out of labor force*, and *in active forces* (i.e., enlisted in military). Labor force status was dummy coded with *employed* serving as the base category for analysis.

Education was represented by the highest year of schooling completed.

Depression was represented using a 7-item version of the Center for Epidemiological Studies Depression Scale (CES-D). Participants reported how often they experienced various symptoms of depression in the past week. Responses were made on a 4-point scale, ranging from 0, "rarely or none of the time (< 1 day)" to 3, "most or all of the time (5–7 days)." All respondents completed the CES-D in 1992 and 1994. Starting in 1998, respondents also took the CES-D in the survey period following their 40th as well as 50th birthdays. Hence, for the last two survey periods, the year which respondents complete the CES-D depended on their birth year. Depression scores were natural log transformed owing to their strong positive skew.

### 2.2.5 Job Satisfaction

Job satisfaction was measured every year of data collection with this item, "*How do/did you feel about your job/current assignment/business with [employer name]?"* Response

[2] From 1979 to 2000, the NLSY79 provided 1970 occupation classification codes which could be linked to the Hodge-Siegel-Rossi scores. In 2002, the NLSY79 changed how it classified occupations to the updated 2000 occupation classification codes. We used the crosswalk provided by Frederick and Hauser (2010) to classify prestige with the 2000 classification system and the updated Nakao and Treas (1994) system based on Hodge-Siegel-Rossi scores.

options ranged from 1 ("like it very much") to 4 ("dislike it very much"). In addition to this global item, 10 more specific items (e.g., regarding satisfaction with supervisor, experiences, etc.) were included in five years of data collection (1979–1982 and 1988). To avoid relying on a single-item measure, we assessed the appropriateness of combining the measure of global satisfaction with these more specific items. Item-test correlations and contribution to coefficient alpha supported the psychometric quality of the measure after dropping two items. An extensive discussion of the psychometric evaluation of the job satisfaction is reported in Supplementary Appendix 1. The coefficient alpha for the nine item job satisfaction scale used in the present study (non-multiply imputed) was $\alpha = 0.779$ ($\alpha = 0.775$; multiply imputed).

### 2.3 Handling of Missing Data

Missing data on the NLSY79 were extensive and we discuss in this section how we approached remediating such missing data. A more extensive and detailed discussion of missing data is offered in Supplementary Appendix 2, including results from the imputation, descriptive statistics and a correlation with imputed and non-imputed data, and analysis results with differing amounts of imputed and missing data.

One of the most central reasons for missing data was that respondents from sample was systematically dropped and not re-contacted by design (1079 in 1985 and 1621 in 1991); hence, these respondents had known reasons for missing data. Others respondents however were difficult to contact, were deceased, or refused to participate in re-contact efforts. By 2012, around 40% of the original sample was not contacted again for one of the above reasons which accounted for a large proportion of the missing observations for specific respondents. In addition, and as noted above, many variables also only were assessed in selected years (e.g., job characteristics, depression). This also accounted for a substantial amount of missing data for specific variables.

In order to use as much of the NLSY79 data as we could to evaluate change over time, we used multiple imputation to fill in missing responses. Multiple imputation is a useful approach for the present analysis as much of the data were missing by design and, consequently, the missingness mechanism for these instances was known and could be validly imputed. To improve imputation validity for the respondents who were not dropped by design, we included several auxiliary variables which were correlated with missingness likelihood: dummy-coded year of survey, dummy-coded sample designation, AFQT score percentile, worker class, and a Big Five Personality measure. The sample designation codes included the respondent's gender, race-ethnicity category, and type of sample (cross-sectional, supplemental, or military). The AFQT score percentile was each respondent's percentile rank on the Armed Services Vocational Aptitude Battery administered in survey year 1980. Worker class included whether the employee was employed by government, private for profit business, non-profit organization, were self-employed, or were working in a family business; worker class was asked each survey year. In addition, a final set of 10 auxiliary variables representing the Big Five personality traits (2-items each) administered in survey year 2014 were included to improve imputation of item-level missing data for consistent respondents over the NLSY79's 26 survey times. All data were imputed using the multivariate imputation chained equations approach (e.g., White et al. 2011). We produced 100 imputations to ensure sufficient imputation-based estimate stability and reproducibility. As is noted above, details about the imputation are available in Supplementary Appendix 2.

### 2.4 Analysis Approach

The NLSY79 data are longitudinal, and our interest is in the effect of changes in the various job features on changes in job satisfaction. We thus chose to model the data using first differenced linear regressions (e.g., Allison 1994). The first differenced regression models change explicitly by using each dependent variable and independent variable at the current time period subtracted from its value at the last time period. In addition to modeling change, this approach also removes any between-person variance from the dependent and independent variables thereby isolating within-person variance.

We estimated the first-differenced model using a weighted average least square (WALS; Magnus et al. 2010) regression. WALS is a quasi-Bayesian, linear regression model which incorporates uncertainty about the selection of the predictors in the model into the estimates and standard errors. In brief, WALS is an approximation to a full Bayesian model averaging approach (e.g., Hoeting et al. 1999) which semi-orthogonalizes all predictors about which there is uncertainty (conceptually equivalent to estimating all model subsets) and averages them together using a Laplace estimator to separate all predictors' weight estimation. Given its approximation to a Bayesian model average, the WALS model is a more methodologically consistent estimator for an exploratory analysis where predictor selection is unknown. In addition to reporting the WALS coefficients, we also estimated the relative weights (RWA; Johnson 2000) for each job feature variable that obtained a non-trivial effect size (WALS 95% confidence interval did not include 0). The RWA allows for assessing the relative importance of each predictor in explaining changes in job satisfaction.

## 3 Results

The results from the first difference WALS regression and from the relative weights analysis appear in Table 1. Again, only variables which were selected by the WALS regression were used in the RWA. The overall model explained 23% (i.e., $R^2 = 0.2284$) of the variance in job satisfaction change.

We first discuss the research question related to whether changes in intrinsic and social job features would be more important than those associated with extrinsic job features in predicting job satisfaction change. The results in Table 1 show support for the idea that intrinsic and social job features as being more important. Specifically, of the variables selected by the WALS regression, the top five in importance were all intrinsic and social job features. Collectively, these five features accounted for 87% of the total variance in job satisfaction change explained by the model (i.e., $R^2$ associated with these five variables is 0.1984 or approximate 87% of the total $R^2$). Changes in the extrinsic job features (i.e., pay and prestige) also were associated with shifts in job satisfaction, but emerged as the 6th and 7th most important predictors, respectively. On average, they each explained ~ 4% of the variance in the model (comprising ~ 9% of the $R^2$ value combined).

With respect to particular intrinsic and social features, Table 1 shows that changes to task significance and skill variety proved most important. Specifically, task significance alone resulted in a 0.08 coefficient and explained, on average, 6.9% of the variance in job satisfaction change (comprising 30% of the $R^2$ value). Skill variety change resulted in a 0.05 coefficient and explained on average 4.0% of the variance in job satisfaction change (comprising 17% of the $R^2$ value). One of the two social job features—workplace

**Table 1** First-difference, weighted least squares regression and relative analysis results

| Variable | $\beta$ | *SE* | $\varepsilon$ | Rank |
|---|---|---|---|---|
| *Intrinsic job features* | | | | |
| Autonomy | 0.0284* | 0.0045 | 0.0217 | 5 |
| Hours/day worked | −0.0004 | 0.0012 | – | – |
| Task feedback | 0.0521* | 0.0070 | 0.0322 | 4 |
| Skill variety | 0.0553* | 0.0039 | 0.0397 | 2 |
| Task identity | 0.0012 | 0.0043 | – | – |
| Task significance | 0.0849* | 0.0035 | 0.0685 | 1 |
| *Social job features* | | | | |
| Social interaction | 0.0028 | 0.0038 | – | – |
| Workplace friendship | 0.0615* | 0.0042 | 0.0364 | 3 |
| Extrinsic job features | | | | |
| Pay (log) | 0.0790* | 0.0061 | 0.0110 | 6 |
| Prestige | 0.0029* | 0.0002 | 0.0101 | 7 |
| *Other factors* | | | | |
| Depression (log) | −0.0202 | 0.0125 | – | – |
| Education | −0.0068* | 0.0021 | 0.0004 | 12 |
| Employment status | | | | |
| Unemployed | −0.0811* | 0.0083 | 0.0052 | 8 |
| Out of labor force | −0.0470* | 0.0078 | | |
| In active forces | −0.0198* | 0.0276 | | |
| No. of jobs (log) | 0.0174* | 0.0095 | 0.0010 | 10 |
| Org. size (log) | 0.0074* | 0.0026 | 0.0016 | 9 |
| Org. tenure (log) | −0.0159* | 0.0028 | 0.0006 | 11 |
| *Position status* | | | | |
| Promotion | 0.0193 | 0.0272 | – | – |
| Demotion | −0.0074 | 0.0279 | | |
| Lateral change | −0.0113 | 0.0669 | | |
| Model intercept | 0.0012 | 0.0012 | | |

N = 317,150. Results are reported for the first-differenced model using weighted average least square regression. ε = Relative weight. Rank = rank order importance of predictors produced by relative weight analysis. Employment was combined into predictor sets for the relative weight analysis

*95% Confidence Interval does not include 0

friendship, was ranked 3rd, explaining 3.6% of the variance (comprising 14% of the $R^2$ value). Task feedback was the 4th most important predictor overall, and autonomy was 5th most important. Of note, some of these results appear to diverge from between-person findings—a point to which we return below.

Despite the generally strong effects of the intrinsic and social features, also important to mention is that not all of them were strong predictors. Of the remaining intrinsic factors, neither task identity nor hours worked per day and task identity was not significant predictors. Furthermore, although workplace friendship was among the most important contributor to changes in satisfaction, the other social feature—social interaction—did not significantly predict these changes. Thus, while intrinsic and social changes generally do predominate, not all of these features seem to impact within-person changes in satisfaction.

The additional factors consistently emerged as less important variables than the substantive ones of interest. A few findings regarding these factors also warrant attention though. First, although low in relative importance, changes to organizational tenure and years of educational attainment both resulted in reduced job satisfaction. We speculate that the reason education and tenure show this pattern is due to our controlling for intrinsic, social, and extrinsic job features characteristics. That is, tenure and education could be mechanisms for obtaining intrinsic, social, and extrinsic job features. However, more education and time at an employing organization results in decrements in satisfaction when not accompanied by improvements in those features (see Mottaz 1984 for similar findings). Similarly, position status changes without corresponding changes in these features, shows no net effect on job satisfaction. Finally, the non-significant effect of change in depression seems noteworthy.

The results in Table 1 also speak to a second intended contribution here—that of examining the unique contribution of the predictors. With respect to sets of features, the results reveal that changes in intrinsic, social, and extrinsic factors all uniquely contribute to changes in job satisfaction. Perhaps more surprising are the findings within the categories of job features. As seen in Table 1, changes in four of the five aspects of the JCM (save for task identity) are uniquely—and relatively strongly—related to changes in satisfaction. Also, changes in pay and prestige make unique, albeit more modest, contributions. We discuss these findings below.

## 4 Discussion

The primary goal of this analysis was to evaluate relative strength and potentially unique contributions of changes in various job features for within-person job satisfaction over the career span. The results document that features associated with work tasks along with workplace friendship clearly contribute most to within-person satisfaction, accounting for almost two-thirds of the total $R^2$. By comparison, factors like pay, prestige, tenure, and the size of the organization were considerably less important. Moreover, the intrinsic features—such as task significance and job autonomy—were strong predictors even when considered together, suggesting that they operate through partially different mechanisms. Beyond documenting the importance of these features, though, the present analysis also highlights some discrepancies—both from what job-holders seem to report as most important for satisfaction and, in some cases, from the conclusions based on cross-sectional research. In the hopes of contributing to theory and future investigations, we focus the following discussion on these discrepancies.

Beginning with the former point, the current results appear to deviate substantially from reports of what individuals believe to be most important for their job satisfaction. Whereas job incumbents believe compensation to be among the most central sources of satisfaction and intrinsic factors to be of far less consequence (SHRM, 2016), the current findings reveal a largely opposite pattern. How are we to reconcile this apparent inconsistency? Several explanations seem plausible to us.

To begin, we speculate that there are a couple plausible reasons for a tendency to rate pay as especially important. First, insofar as individuals view work as disutility (i.e., an unpleasant enterprise performed exclusively for financial purposes), equating increased pay with increased satisfaction may be fairly axiomatic. In addition, people may emphasize pay (and other extrinsic features) due to their relatively low level of satisfaction with such features. In the 2016 SHRM survey, 63% of respondents rated pay as very

important for satisfaction, but only 23% of them reported being very satisfied with their current pay—ranking it 27th among the 32 aspects in terms of level of satisfaction. Thus, whereas employees generally are satisfied with most aspects of the job (SHRM 2016), the lower satisfaction with pay may trigger its salience as an important contributor to overall satisfaction.

Despite the seeming rationality of such thought processes, the current results suggest that beliefs of a strong linkage between extrinsic features and satisfaction are largely erroneous. Whereas we only can conjecture about reasons for this disconnect, existing findings from the literature on (income and) well-being offer some clues. First, people may fail to appreciate the dispositional sources of job satisfaction (Thoresen et al. 2003) as well as the rapid adaption to economic fluctuations (see Diener and Biswas-Diener 2002). Along similar lines, there may be a failure to foresee that increases in money tend to create changing standards, expectations, and referent groups—all serving to diminish the anticipated hedonic benefits of such increases (Diener and Biswas-Diener 2002). In addition, the phenomenon whereby focusing on money diminishes well-being (Kasser and Ryan 1993) may go unrecognized. Finally, individuals may fail to appreciate the stressors that higher income jobs often bring with them (e.g., less leisure time, greater responsibility (e.g., Thoits and Hannan 1979).

On the flip side, there (also) may be a propensity to underestimate the impact of intrinsic and social work features. Evidence increasingly documents that job satisfaction derives from the everyday affect that people experience on the job (e.g., Judge et al. 2017). This affect largely is a result of everyday interactions, events, and behaviors, which themselves reflect the social and task atmosphere (Weiss 2002). Put simply, most employees likely do not spend their days reacting to their pay but instead to daily workplace encounters and encounters. Also, the current findings for task significance highlight the value of seeing one's everyday tasks as impactful. To the extent there is a systematic tendency not to appreciate these effects, an undervaluing of intrinsic and social features for job satisfaction would follow.

Moving forward, beyond trying to test and compare these explanations, another practical recommendation we would offer is to conduct similar large-scale, within-person analyses in countries and societies with very low incomes. Plausibly, the intrinsic and social effects described above may be less impactful in such populations, whereas the extrinsic ones may predominate (see Myers and Diener 1995). More broadly, we imagine that the rank-order importance of these predictors probably varies as a function of various background and dispositional variables (e.g., personality traits and values).

Also, in a more practical manner, we wonder about the possibility of an educational program to help foster awareness of the relative importance of intrinsic and social features. Employees rate extrinsic factors as especially important in their decision to seek other jobs (SHRM 2016). However, the decision to leave one's current job based on pay considerations may not translate into the expected gains in job satisfaction. Educating employees to help them make better-informed decisions would appear to be a worthwhile endeavor.

The current results also show some discrepancies with those from relevant cross-sectional of job satisfaction. In particular, while both sets of findings demonstrate the relative dominance of intrinsic and social factors relative to extrinsic ones (e.g., Mottaz 1985), findings regarding the (relative) impact of specific features, as well as their distinctiveness, appear to somewhat diverge. For example, whereas meta-analyses (mainly based on cross-sectional studies) show that all five of Hackman and Oldham's (1976) job characteristics significantly relate to satisfaction (Fried and Ferris 1987; Humphrey et al. 2007), the current analysis showed that changes in task identity did not significantly predict changes in

satisfaction. Furthermore, while the confidence intervals generally overlap, autonomy was a strong correlate of job satisfaction among the five JCM factors in both these meta-analyses. Here, though, autonomy ranked 4th among the five characteristics. While we only can speculate about the reasons for these discrepancies, one possibility is that the effects of shifts in task identity and autonomy are less salient in the short term and/or are more impactful in long-term deliberative judgments about satisfaction (Weiss 2002). Studies attempting to capture mediating within-person process as well as qualitative investigations would seem appropriate to verify and help explain these findings.

Also of interest in the present analysis is the apparent unique effects of changes in the various job characteristics. As seen in Table 1, changes in all of the job characteristics (with the exception of task identity) remained significant (and relatively strong). This finding suggests that these characteristics at least partly operate through different mechanisms. While Humphrey et al. (2007) do not report the unique validities of the different characteristics, their mediational analysis revealed that "experienced meaningfulness" was the critical mediating state—largely, but not completely explaining the impact of the five characteristics. Also, at least some factor analyses based on cross-sectional data cast doubt on the distinctiveness of the dimensions (see Idaszak et al. 1988). The current findings, though, suggest that the characteristics are distinguishable longitudinally and may also operate through somewhat different mechanisms at the within-person level. In sum, these findings generally seem to support basic tenets of JCM, but also suggest that investigating the mediational processes explaining the impact of the various factors in a within-person paradigm could contribute theoretically.

### 4.1 Limitations

The current study also has some limitations. First, although the database contains a large and broad set of variables, there obviously are additional job features that one could consider. For example, long-term longitudinal studies examining the impact of changes in: relationship with one's supervisor, organizational leadership, organizational culture, and role stressors all would seem valuable. A second limitation is that the job features were assessed using single items. This said, the finding that these variables were significant predictors despite being single items perhaps suggests that this limitation was not severe. Also, the predictor variables differed in various ways such as the shapes of their distributions, their variances, and (likely) their reliabilities. While we attempted to minimize these dissimilarities through transformations, remaining differences still may have impacted the results.

An additional methodological limitation is the large amount of missing data. To examine the impact of the missingness, we also conducted the analyses using only cases with at least 1 non-missing complete job satisfaction response and found results that were almost identical to those reported in Table 1 (see Supplementary Appendix 2). Thus, although this amount of missing data is not desirable, it did not seem to result in biased conclusions.

Also worthy of mention is that we obviously cannot be certain of the degree to which the current findings generalize to other cohorts (e.g., if these data were collected in the early part of the 20th Century instead). Given changing societal norms, expectations, etc. over time, the importance of certain factors for job satisfaction also may change. This said, our focus on within-person change would seem to largely negate the impact of any cohort effects. Thus, for example, even if pay was more important for job satisfaction in earlier

years (or is in more recent years), that difference should not impact relative importance of year-to-year *change in pay* across the cohorts.

The exception to this would be if the importance of pay changed for given cohorts during the course of the study. As an anonymous reviewer pointed out, particular events (like the 9/11 terrorist attacks) could impact the relative importance of the factors we studied here—and, in turn, the generalizability of the findings. Research examining the effect of major social or political events on job satisfaction is certainly a potential future research direction. Also important to note, though, is that large scale analyses reveal job satisfaction levels have been largely stable over decades and do not substantially seem to differ by cohort (including those examined in the current study; Blanchflower and Oswald 2011; Costanza et al. 2012). In sum, we would suggest that our findings should be fairly robust across time, although there obviously may be some differences too.

In spite of these limitations, this analysis can provide strong conclusions regarding the impact of changes in various job features in job satisfaction over the career span and hopefully can serve to engender future theoretical and empirical work on within-person satisfaction.

## 5 Conclusion

We intended the current study to be a large-scale investigation of the comparative importance, and uniqueness, of changes in different job features for within-person job satisfaction over the career span. Results clearly demonstrate the significance of fluctuations in task features and in workplace social relationships for changing job satisfaction. Increased task significance emerged as an especially strong predictor of higher job satisfaction. In contrast, changes in income and prestige resulted in appreciably weaker shifts in job satisfaction.

We suggest these findings are particularly noteworthy in light of results consistently linking job satisfaction to more global indices of well-being, such as (context-free) depression, anxiety, and physical health (Faragher et al. 2005). Obviously, individuals are not always in a position to prioritize job satisfaction when choosing among jobs (or whether or not to change jobs). But, when they can do so, the present results strongly suggest weighing task-related and social job features over external ones like pay, prestige, and status as means to attain higher job satisfaction.

## References

Agho, A. O., Mueller, C. W., & Price, J. L. (1993). Determinants of employee job satisfaction: An empirical test of a causal model. *Human Relations, 46,* 1007–1102.

Allison, P. D. (1994). Using panel data to estimate the effects of events. *Sociological Methods & Research, 23,* 174–199.

Barsky, A., Thoresen, C. J., Warren, C. R., & Kaplan, S. A. (2004). Modeling negative affectivity and job stress: a contingency-based approach. *Journal of Organizational Behavior, 25,* 915–936.

Blanchflower, D. G., & Oswald, A. J. (2011). International happiness: A new view on the measure of performance. *Academy of Management Perspectives*, *25*, 6–22.

Brief, A. P. (1998). *Attitudes in and around organizations*. Thousand Oaks: Sage.

Chen, G., Bliese, P. D., & Mathieu, J. E. (2005). Conceptual framework and statistical procedures for delineating and testing multilevel theories of homology. *Organizational Research Methods, 8,* 375–409.

Costanza, D. P., Badger, J. M., Fraser, R. L., Severt, J. B., & Gade, P. A. (2012). Generational differences in work-related attitudes: A meta-analysis. *Journal of Business and Psychology, 27,* 375–394.

Curran, P. J., & Bauer, D. J. (2011). The disaggregation of within-person and between-person effects in longitudinal models of change. *Annual Review of Psychology, 62,* 583–619.
Diener, E., & Biswas-Diener, R. (2002). Will money increase subjective well-being? A literature review and guide to needed research. *Social Indicators Research, 57,* 119–169.
Dobrow Riza, S., Ganzach, Y., & Liu, Y. (2018). Time and job satisfaction: A longitudinal study of the differential roles of age and tenure. *Journal of Management, 44*(7), 2558–2579.
Faragher, E. B., Cass, M., & Cooper, C. L. (2005). The relationship between job satisfaction and health: A meta-analysis. *Occupational and Environmental Medicine, 62,* 105–112.
Frederick, C., & Hauser, R. M. (2010). *A crosswalk for using pre-2000 occupational status and prestige codes with post-2000 occupation codes* (CDE Working Paper No. 2010-03). University of Wisconsin-Madison.
Fried, Y., & Ferris, G. R. (1987). The validity of the job characteristics model: A review and meta-analysis. *Personnel Psychology, 40,* 287–322.
Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance, 16,* 250–279.
Hauser, R. M., & Warren, J. R. (1997). Socioeconomic indexes for occupations: a review, update, and critique. *Sociological Methodology, 27,* 177–298.
Hodge, R. W., Siegel, P. M., & Rossi, P. H. (1964). Occupational prestige in the United States, 1925-63. *American Journal of Sociology, 70,* 286–302.
Hoeting, J. A., Madigan, D., Raftery, A. E., & Volinsky, C. T. (1999). Bayesian model averaging: a tutorial (with comments by M. Clyde, David Draper and E. I. George, and a rejoinder by the authors. *Statistical Science, 14,* 382–417.
Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: a meta-analytic summary and theoretical extension of the work design literature. *Journal of Applied Psychology, 92*(5), 1332–1356.
Idaszak, J. R., Bottom, W. P., & Drasgow, F. (1988). A test of the measurement equivalence of the revised job diagnostic survey: past problems and current solutions. *Journal of Applied Psychology, 73,* 647–656.
Johns, G., Xie, J. L., & Fang, Y. (1992). Mediating and moderating effects in job design. *Journal of Management, 18,* 657–676.
Johnson, J. W. (2000). A heuristic method for estimating the relative weight of predictor variables in multiple regression. *Multivariate Behavioral Research, 35*(1), 1–19.
Judge, T. A., Bono, J. E., & Locke, E. A. (2000). Personality and job satisfaction: The mediating role of job characteristics. *Journal of Applied Psychology, 85,* 237–249.
Judge, T. A., Piccolo, R. F., Podsakoff, N. P., Shaw, J. C., & Rich, B. L. (2010). The relationship between pay and job satisfaction: A meta-analysis of the literature. *Journal of Vocational Behavior, 77,* 157–167.
Judge, T. A., Weiss, H. M., Kammeyer-Mueller, J. D., & Hulin, C. L. (2017). Job attitudes, job satisfaction, and job affect: A century of continuity and of change. *Journal of Applied Psychology, 102*(3), 356–374.
Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream: Correlates of financial success as a central life aspiration. *Journal of Personality and Social Psychology*, *65*, 410–422.
Lucas, R. E. (2007). Adaptation and the set-point model of subjective well-being does happiness change after major life events? *Current Directions in Psychological Science, 16*(2), 75–79.
Luchman, J., & Gonzalez-Morales, M. Gloria. (2013). Demands, control and support: A meta-analytic review of work characteristic interrelationships. *Journal of Occupational Health Psychology, 18,* 37–52.
Magnus, J. R., Powell, O., & Prüfer, P. (2010). A comparison of two model averaging techniques with an application to growth empirics. *Journal of Econometrics, 154,* 139–153.
Mohanty, M. S. (2016). Relationship between positive attitude and job satisfaction: Evidence from the US data. *Eastern Economic Journal, 42,* 349–372.
Mohanty, M. S. (2018). Does positive attitude matter only for older workers? Evidence from simultaneous estimation of job satisfaction, wage and positive attitude in the United States. *Journal of Happiness Studies, 19*(8), 2373–2404.
Mottaz, C. J. (1984). Education and work satisfaction. *Human Relations, 37,* 985–1004.
Mottaz, C. J. (1985). The relative importance of intrinsic and extrinsic rewards as determinants of work satisfaction. *The Sociological Quarterly, 26*(3), 365–385.
Myers, D. G., & Diener, E. (1995). Who is happy? *Psychological Science, 6,* 10–19.
Nakao, K., & Treas, J. (1994). Updating occupational prestige and socioeconomic scores: How the new measures measure up. *Sociological Methodology, 24,* 1–72.

Ng, T. W. H., & Feldman, D. C. (2010). The relationships of age with jobattitudes: A meta-analysis. *Personnel Psychology*, *63*, 677–718.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55,* 68–78.

Society for Human Resource Management. (2016). *Employee job satisfaction and engagement: Revitalizing a changing workforce*. Alexandria, VA, USA.

Spector, P. E., Rogelberg, S. G., Ryan, A. M., Schmitt, N., & Zedeck, S. (2014). Moving the pendulum back to the middle: Reflections on and introduction to the inductive research special issue of Journal of Business and Psychology. *Journal of Business and Psychology, 29,* 499–502.

Thoits, P., & Hannan, M. (1979). Income and psychological distress: The impact of an income-maintenance experiment. *Journal of Health and Social Behavior, 20,* 120–138.

Thoresen, C. J., Kaplan, S. A., Barsky, A., Warren, C. R., & deChermont, K. (2003). The affective underpinnings of job perceptions and attitudes: A meta-analytic review and integration. *Psychological Bulletin, 129,* 914–945.

Warr, P. (2007). *Work, happiness, and unhappiness*. Mahwah: Lawrence Erlbaum Associates.

Weiss, H. M. (2002). Deconstructing job satisfaction: Separating evaluations, beliefs and affective experiences. *Human Resource Management Review, 12,* 173–194.

White, I. R., Royston, P., & Wood, A. M. (2011). Multiple imputation using chained equations: issues and guidance for practice. *Statistics in Medicine, 30,* 377–399.

Zhou, Y., Zou, M., Williams, M., & Tabvuma, V. (2017). Is the grass greener on the other side? A longitudinal study of the impact of employer change and occupational change on job satisfaction. *Journal of Vocational Behavior, 99,* 66–78.