1   The title

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Abstract

One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline.

Two to three sentences of **more detailed background**, comprehensible to scientists in related disciplines.

One sentence clearly stating the **general problem** being addressed by this particular study.

One sentence summarizing the main result (with the words "**here we show**" or their equivalent).

Two or three sentences explaining what the **main result** reveals in direct comparison to what was thought to be the case previously, or how the main result adds to previous knowledge.

One or two sentences to put the results into a more **general context**.

Two or three sentences to provide a **broader perspective**, readily comprehensible to a scientist in any discipline.

Keywords: keywords

Word count: X

₃₁   The title

₃₂ **Abstract**

₃₃   The relationships among sum of perceived job resources, challenge- and hindrance

₃₄ demands and outcomes of organizational outcomes of engagement, stress, and burnout are

₃₅ explored. 568 workers rated O*Net job characteristics in terms of relevance and

₃₆ perceptions as challenges, hindrances and resources. The findings are generally aligned

₃₇ with the job demands resource theory regarding associations between perceived resources,

₃₈ demands, and organizational outcomes of engagement, stress, and burnout.

₃₉ **Perception of Work Demands and Resources: Does Volume Relate to**

₄₀ **Engagement, Stress, or Burnout?**

₄₁   A plethora of research applying the job demands-resources model (Demerouti et al.,

₄₂ 2001) and job demands-resources theory (Bakker & Demerouti, 2017) underscore the

₄₃ importance of work characteristics on the experience of motivation and strain. However,

₄₄ much of our existing research on this topic assumes that certain characteristics are

₄₅ resources and others are generally considered demands. This study explores how individual

₄₆ perceptions of these work characteristics relate to engagement, stress, and burnout by

₄₇ asking respondents to indicate (of the characteristics that apply to their jobs) how much

₄₈ each is a resource, challenge, or hindrance demand. Amount of perceived resources,

₄₉ challenges, and hindrances can then be associated with engagement, stress, and burnout.

₅₀ **The Job Demands-Resources Theory**

₅₁   The theoretical foundation for this study is the job demands-resources theory

₅₂ (Demerouti et al., 2001). Using this theory, we can model both work environment and job

₅₃ characteristics via job resources and demands. Resources include physical, psychological,

₅₄ social, or organizational aspects of the job that may help an employee achieve work goals,

₅₅ reduce job demands, or promote personal growth and development (Demerouti et al.,

₅₆ 2001). In contrast, demands include components of a job that require sustained effort, and

57 as such, produce psychological or physiological strain (e.g., high work pressure; Demerouti

58 et al., 2001).

59   The perception of a characteristic of one's job as a resource or demand activates one

60 of two unique processes: either health impairment or motivation Bakker & Demerouti,

61 2014). Demanding job characteristics are frequently associated with negative outcomes

62 (e.g., health impairment process; Bakker et al., 2003), whereas job characteristics

63 considered resources have been associated with positive organizational outcomes like

64 engagement and motivation (Bakker et al., 2007).

65 **An Added Complexity: Perception (Appraisal) of Work Characteristics**

66 **Might Matter**

67   The above description speaks to one of two distinct processes being activated,

68 presumably based on one's assessment of how a work characteristics makes them feel (e.g.,

69 consider the different reactions employees may have to being nominated to give a speech at

70 an upcoming company event). Thus, although some research on job demands in particular

71 is based on a priori classifications of demands (Searle & Auton, 2015), the appraisal of any

72 work characteristic as a demand or resource is quite subjective. The literature on the

73 experience of stress explains how such individual differences in appraisal are possible.

74 Specifically, the transactional theory of stress and coping states that people cognitively

75 appraise stimuli in their environments on a continuous basis (Lazarus & Folkman, 1984).

76 During this process, meaning is assigned to stimuli. If the above employee appraised the

77 upcoming speech as threatening, challenging, or possibly harmful, the resulting emotional

78 distress initiates coping (e.g., attempting to decline, asking for help in writing the speech).

79 From that point, the cycle of appraisal continues based on the action to cope with the

80 stressor (Lazarus & Folkman, 1984).

81 **Could a Work Demand be Appraised Positively?: The**

82 **Challenge-Hindrance Framework**

Although the word "stress" often connotes something negative, Selye (1936) defined stress generically as a response to change. For instance, the example above describes an employee who appraises being nominated to give a speech as a negative stressor. However, another employee may appraise the nomination to do so as an opportunity to share their experiences with more of their coworkers, or one in which they may receive recognition they have desired. The terms associated with the two different appraisals of the stressor described here are challenge and hindrance demands (Cavanaugh et al., 2000) Specifically, challenge demands promote mastery, personal growth, and future gains. Hindrance demands, in contrast, inhibit growth, learning and goal achievement. Perhaps not surprisingly, challenge stressors are typically associated with positive outcomes, whereas hindrance stressors are associated with more negative outcomes (e.g., Cavanaugh et al., 2000). We will explore their associations with both positive and negative outcomes in this study.

Prior to proposing specific predictions, the empirical evidence on challenge and hindrance demands is very briefly shared below. To begin, the first logical question is whether employees actually distinguish between challenge and hindrance stressors, and research suggests that they can and do. For example, Bakker and Sanz-Vergel (2013) found that perceived work pressure can be classified as a hindrance demand, and emotional demands as a challenge demand. Webster et al. (2011) considered three common workplace demands including workload, role ambiguity, and role conflict. Interestingly, they found that while each could be appraised primarily as challenges or hindrances, employees could also simultaneously be perceived as being both a challenge and hindrance.

Having established that there can be individual differences in the appraisal of demands as challenges or resources, we next turn our attention to their association with organizational outcomes ranging from affective variables like job satisfaction, to motivation, performance, and well-being. For example, Cavanaugh et al. (2000) found that challenge demands were positively related to job satisfaction and negatively related to job

search behaviors, while hindrance demands demonstrated the opposite pattern with job

satisfaction and job search behaviors in a sample of managers. However, Abbas and Raja

(2019) found that challenge and hindrance stressors were both positively related to strain

and turnover intentions. We also have some evidence that challenge-hindrance appraisals

are related to engagement in the expected direction whereby hindrance appraisals are

negatively associated with engagement and challenge appraisals are positively associated

with engagement (Crawford et al., 2010). The appraisal process also suggests theoretically

that the perception of a job characteristic as a challenge or hindrance is a mediator. Gerich

(2017), for instance, found that employee well-being was, in part, explained by appraised

challenge or hindrance demands such that working conditions of time pressure, qualitative

demands, responsibility, and interruptions, were partially mediated by challenge and

hindrance demands. To provide further evidence of the distinction between challenge and

hindrance appraisals on work-related outcomes, Podsakoff et al.'s (2007) meta-analysis

supported the original assertion of Cavanaugh et al. (2000) such that challenge stressors

were positively related to job satisfaction and organizational commitment, and negatively

related to both turnover intentions and actual turnover, while hindrance stressors produced

the opposite pattern of relationships.

Current Study and Hypotheses

The brief review above provides theoretical and empirical support for the connection

between resources and positive organizational outcomes, and between demands and

negative outcomes. Here, we explored whether the amount or volume of perceived

resources and demands (in the form of challenges and hindrances) would be related

differently to three organizational outcomes: engagement ("a positive affective experience

defined as a fulfilling, work-related state of mind characterized by vigor, dedication, and

absorption", Schaufeli et al., 2002), workplace stress ("an individual state characterized by

a combination of high arousal and displeasure", p. 15, Pejtersen et al., 2010) and burnout

("the degree of physical and psychological fatigue and exhaustion that is perceived by the

person as related to his/her work", p. 197; Kristensen et al., 2005). Utilizing the job

demands-resources theory, transactional theory of stress, and the challenge-hindrance

framework, we propose that the number of job characteristics appraised as "challenge

demands" (i.e., promote mastery, personal growth, and future gains) would activate a

positive state – that of engagement. In contrast, number of characteristics of one's job

appraised as a hindrance demand (i.e., inhibit growth, learning and goal achievement)

would activate a negative state – here, stress.

Hypothesis 1a-1c: Total number of resources are positively associated with

engagement (1a), and negatively associated with stress (1b) and burnout (1c). *Hypothesis*

2a-2c: Total number of challenge demands are positively associated with engagement (2a),

and negatively associated with stress (2b) and burnout (2c). *Hypothesis 3a-3c*: Total

number of hindrance demands are negatively associated with engagement (3a), and

positively associated with stress (3b) and burnout (3c).

 In addition to exploring associations with our outcomes, we also sought to explore whet

Hypothesis 4: Characteristics perceived as challenges are also viewed as resources.

In addition to the above predictions, we consider, in an exploratory fashion, whether or

Method

We evaluate relationships between the predictors and proximal outcomes of the Job

Demands-Resources model (Bakker & Demerouti, 2017; Bakker et al., 2003; Demerouti et

al., 2001), but from within the unifying framework of O*Net. Here, we focus on the*

*relationship between O*Net delineated job components and employee levels of job

engagement, job stress, and burnout with a U.S. workforce representative sample.

Participants

161   A sample using a Prolific panel resulted in 785 individuals who initially accessed the

162   survey link. Of those,112 indicated that they were not interested, had more than 200

163   missing responses, or had 20 or more identical consecutive sequential responses (Yentes &

164   Wilhelm, 2021). Additional screening using four embedded attention checks resulted in the

165   retention of 568 respondents. A total of 13.57% had been in their job less than 6 months,

166   19.20% between 6 months and a year, 49.12% between one and five years, 13.27% between

167   5 and 10 years, and 4.87% more than 10 years. Reported ages ranged from 18 to 65 with an

168   average of 28.18 years old (SD = 7.53). Gender was captured via a free-field gender identity

169   category, although the sample predominantly self-identified as female (52.58%) or male

170   (46.83%). Jobs were classified into the International Standard Classification of Occupations

171   (ISCO) via the package labourR (Kouretsis et al., 2020). Modify or omit? *Materials*

172   *Characteristics, Demands, and Resources. Our analyses included items within O*Net's

173   *classifications of "work activity": 1) Information Input (5 statements), 2) Interacting with*

174   *Others (17 statements), 3) Mental Processes (10 statements), and 4) Work Output (9*

175   *statements) and "work context": 5) Interpersonal Relationships (14 statements), 6)*

176   *Physical Work Conditions (30 statements)1, and 7) Structural Job Characteristics (13*

177   *statements). Other than minor grammatical editing (for example, changing "the" to "you"),*

178   *we retained the O*Net wording for our item stems. We used O*Net's response scales, several*

179   *of which were unique across items, but all shared the same 1 to 5 scale options. Subsequent*

180   *to providing ratings of whether or not an O*Net characteristic was relevant for the

181   respondent's work, each respondent who agreed that an element had at least some

182   relevance to their job was also asked to rate that element in terms of, 1) . . . this aspect of

183   your job is a resource that can be functional in achieving work goals, reduce job demands,

184   or stimulate personal growth/development, 2) . . . this aspect of your job is a challenge

185   that can promote mastery, personal growth, or future gains, and 3) . . . this aspect of your

186   job is a hindrance that can inhibit personal growth, learning, and work goal attainment.

187   *Stress.* Three items taken from the Copenhagen Psychosocial Questionnaire (Burr et al.,

2019). Obtained alpha was .85 in this sample. *Burnout.* Four items were taken from the

Copenhagen Psychosocial Questionnaire (Burr et al., 2019). Alpha was 0.85 in this sample.

Engagement. The 18-item engagement measure was recently developed (Russell et al.,

2022), with the authors specifying three subscales which yielded current sample 's of 0.68

(Absorption) and 0.80 (Vigor), and 0.90 (Dedication). For the purposes of the current

study, we focused on an overall engagement score (18 item aggregate, = 0.91).

Procedure

Data were collected through Prolific, a data collection platform. An email was sent to

a random subset of all eligible participants in the Prolific respondent pool, notifying them

about their eligibility for the study based on demographic information. Eligibility

requirements included being 18+ and holding either a full-time or part-time job.

Participants then voluntarily chose to respond to the survey. The survey was conducted

online via Qualtrics with an estimated completion time of 40-45 minutes. Participants were

asked to think about their primary job while answering the survey, and the items they were

presented with depended on the specific job characteristics they initially specified. Thus, if

a respondent indicated that 5 of the characteristics were not part of their job, they were

not subsequently asked to rate the level of resource, challenge, or hindrance a given item

presented to them. For items that were a part of their jobs, they were then asked to report

how much a characteristic was a resource, and then how much each characteristic was a

hindrance, and finally, how much each item was a challenge. Participants were compensated

for their participation in this study in the amount of six dollars through Prolific.

Results

We used R (Version 4.0.3; R Core Team, 2020) and the R-packages careless (Version

1.1.3; Yentes & Wilhelm, 2021), labourR (Version 1.0.0; Kouretsis et al., 2020), papaja

(Version 0.1.0.9997; Aust & Barth, 2020), and tinylabels (Barth, 2021) for all analyses.

Our analyses are presented by characteristics of work that are rated in terms of being

²¹⁴ resources, challenge demands, and hindrance demands. Pearson correlation coefficients

²¹⁵ between characteristics classified as resources, challenges, and hindrances were obtained to

²¹⁶ investigate the associations among these characteristics. Correlations, means and standard

²¹⁷ deviations among all study variables are presented in Table 1. Results reveal a positive

²¹⁸ association between resources and engagement (r = .34; H1a), but a lack of meaningful

²¹⁹ association between engagement and stress and burnout (H1b and H1c, respectively).

²²⁰ Challenge demands were positively associated with engagement (r = .31; H2a), but were

²²¹ unrelated to stress or burnout (H2b and H2c). Total hindrance stressors were not

²²² significantly associated with our outcomes (H3a-H3c). To further explore H1-H3, we

²²³ conducted three regression analyses: regressing a) engagement, b) stress, and c) burnout

²²⁴ separately onto total resources, challenge and hindrance demands. First, regarding

²²⁵ engagement (F(3, 564) = 26.41, p < .001), the total resources (beta = ??) was predictive

²²⁶ of engagement, but total challenge nor hindrance demands predicted engagement (see

²²⁷ Table 2). Next, stress was not predicted by total resources, challenge, or hindrance

²²⁸ demands, F(3, 564) = 2.47, p = .060 (see Table 3). Similarly, burnout was not predicted by

²²⁹ total resources, challenge, or hindrance demands, F(3, 564) = 1.10, p = .349. See Table 4.

²³⁰   Our fourth prediction suggested a positive association between total resources and

²³¹ total challenge demands. Here, we observed a strong positive relationship, so much so that

²³² it could be argued that these two variables are capturing the same thing (r = .86), as fully

²³³ 74% of the variability was shared. In an exploratory fashion, we also considered whether or

²³⁴ not the pattern of correlations described above was similar across job types.

²³⁵   There were 568 retained respondents.

```
²³⁶ ##                resource hindrance  challenge    burnout      stress engagement
²³⁷ ## resource     1.00000000 0.4671740 0.94633436 0.07026188 0.08895664  0.3659061
²³⁸ ## hindrance    0.46717398 1.0000000 0.46316538 0.10217550 0.14181731  0.0501684
²³⁹ ## challenge    0.94633436 0.4631654 1.00000000 0.07838108 0.10674017  0.3358327
```

```
240  ## burnout     0.07026188 0.1021755 0.07838108  1.00000000  0.69654076 -0.3549613

241  ## stress      0.08895664 0.1418173 0.10674017  0.69654076  1.00000000 -0.2953456

242  ## engagement 0.36590613 0.0501684 0.33583266 -0.35496125 -0.29534556  1.0000000


243  ##

244  ## Call:

245  ## lm(formula = engagement ~ hindrance + challenge + resource, data = data)

246  ##

247  ## Residuals:

248  ##      Min       1Q    Median       3Q      Max

249  ## -2.28900 -0.48821   0.05198   0.53450   2.07255

250  ##

251  ## Coefficients:

252  ##               Estimate Std. Error t value Pr(>|t|)

253  ## (Intercept)  3.0408396  0.1222467  24.875  < 2e-16 ***

254  ## hindrance   -0.0022616  0.0006512  -3.473 0.000554 ***

255  ## challenge   -0.0009931  0.0017269  -0.575 0.565461

256  ## resource     0.0073264  0.0017566   4.171 3.52e-05 ***

257  ## ---

258  ## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

259  ##

260  ## Residual standard error: 0.763 on 564 degrees of freedom

261  ## Multiple R-squared:  0.153,  Adjusted R-squared:  0.1485

262  ## F-statistic: 33.97 on 3 and 564 DF,  p-value: < 2.2e-16


263  ##

264  ## Call:

265  ## lm(formula = burnout ~ hindrance + challenge + resource, data = data)
```

```
266  ##
267  ## Residuals:
268  ##      Min       1Q   Median       3Q      Max
269  ## -2.33223 -0.67843 -0.03482  0.63254  2.10197
270  ##
271  ## Coefficients:
272  ##               Estimate Std. Error t value Pr(>|t|)
273  ## (Intercept)  2.7638017  0.1382398  19.993   <2e-16 ***
274  ## hindrance    0.0013360  0.0007364   1.814   0.0702 .
275  ## challenge    0.0014508  0.0019529   0.743   0.4579
276  ## resource    -0.0009349  0.0019865  -0.471   0.6381
277  ## ---
278  ## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
279  ##
280  ## Residual standard error: 0.8628 on 564 degrees of freedom
281  ## Multiple R-squared:  0.01206,    Adjusted R-squared:  0.006801
282  ## F-statistic: 2.294 on 3 and 564 DF,  p-value: 0.07694

283  ##
284  ## Call:
285  ## lm(formula = stress ~ hindrance + challenge + resource, data = data)
286  ##
287  ## Residuals:
288  ##      Min      1Q  Median       3Q      Max
289  ## -1.8922 -0.7552 -0.1147  0.6988  2.6438
290  ##
291  ## Coefficients:
292  ##               Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept)  2.1772197  0.1541487  14.124  < 2e-16 ***
## hindrance    0.0021433  0.0008212   2.610  0.00929 **
## challenge    0.0032258  0.0021776   1.481  0.13907
## resource    -0.0025593  0.0022151  -1.155  0.24842
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.9621 on 564 degrees of freedom
## Multiple R-squared:  0.02457,    Adjusted R-squared:  0.01938
## F-statistic: 4.735 on 3 and 564 DF,  p-value: 0.00285
```

Table 1

Focal variable correlations (counts data).

	1	2	3	4	5	*M*	*SD*
1. resource	-					203.85	56.73
2. hindrance	.47***	-				129.50	55.80
3. challenge	.95***	.46***	-			203.12	57.57
4. burnout	.07	.10*	.08	-		3.04	0.87
5. stress	.09*	.14***	.11*	.70***	-	2.59	0.97
6. engagement	.37***	.05	.34***	-.35***	-.30***	4.04	0.83