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Passion for work:

What is it, who has it, and does it matter?

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Passion for work: What is it, who has it, and does it matter?**Abstract**

That passion for work matters is a widespread assumption. But how many people are passionate about their work? How does passion for work feel? Does passion matter for relevant work outcomes? Who is likely to experience more passion for work, who less?

We examined these questions with a sample of 14,645 employees from across the U.S. in a mixed-method approach. Passion for work was assessed through open-ended questions, a single item rating the frequency of feeling ‘passionate’ at work, and a multi-faceted passion scale. Self-reports about job experiences were obtained and jobs were classified using O*NET job descriptions.

While employees almost never reported passion spontaneously in their open-ended responses, the majority endorsed passion on the rated measures. Highly passionate employees experienced more positive than negative emotions and job experiences, but one out of three highly passionate employees reported mixed feelings (co-occurring negative and positive emotions) in rated measures. Passion incrementally predicted job outcomes (e.g., creativity, turnover intentions, burnout), beyond the variance explained by related constructs (positive emotions, job satisfaction, engagement).

Employees’ work passion was predicted by their socioeconomic status, rank in the organization, industry sector, and O*NET information about creativity required in their job.

Keywords: Passion, work, emotions, job characteristics, demographics, incremental validity, mixed methods, commitment, engagement.

Passion for work: What is it, who has it, and does it matter?

“Although the passion that people demonstrate at work would appear to be a topic of considerable interest to organizational scholars and practitioners, we know virtually nothing about it” (Perrewé, Hochwarter, Ferris, McAllister, & Harris, 2014, p. 145).

1. Introduction

Passion is a much sought-after attribute in employees, managers, and companies. Investors are more likely to invest in starts-ups that are lead by entrepreneurs they perceive as passionate about their venture (Cardon, Sudek, & Mitteness, 2009; Mitteness, Sudek, & Cardon, 2012). Countless companies advertise their services as driven by passion (e.g., “passion to perform” by Deutsche Bank) and consulting firms like Deloitte recommend that companies should foster passion in their employees to “sustain performance gains” (Hagel, Brown, Ranjan, & Byler, 2014). But are these passion-affirming practices and recommendations evidence-based? Do we know what passion is, who the passionate employees are, and whether passion for work actually matters for business outcomes?

Many of these questions remain unanswered, although the research on passion for work has emerged as a new field in the psychology of motivation in the past 15 years (for an overview, see e.g., Vallerand & Houliort, 2019). Previous research on passion for work has focused on three main aspects: (1) the distinction between “harmonious” and “obsessive” passion (e.g., Vallerand, Houliort, & Bourdeau, 2019), (2) laymen’s implicit beliefs about the stability versus flexibility of passion for work and their consequences (growth vs. fixed mindset; see Chen et al., 2018; O’Keefe et al., 2018), and (3) aspects of entrepreneurial passion (e.g., Cardon, Wincent et al., 2009; Locke & Baum, 2019). While each of these lines of research contributes interesting

angles and approaches, they leave questions about the prevalence and nature of passion in the workplace unanswered. For example, the research on differences between the beneficial harmonious and the harmful obsessive work passion (e.g., Vallerand, Houliort, & Bourdeau, 2019) rarely addresses whether experiencing high passion versus low passion makes a difference in terms of work outcomes. Furthermore, most samples in studies of harmonious and obsessive passion are relatively homogeneous and small, precluding estimation of the prevalence of passion in different demographic groups in the workforce. In turn, research on employees' implicit passion mindsets (e.g., Chen et al., 2018; O'Keefe et al., 2018) focuses on laypeople's beliefs about the malleability or fixedness of passion for work, rather than examining whether people are actually passionate, what the experience of passion for work feels like, and what the predictors of experienced passion are. In contrast, research on entrepreneurial passion seems to fill these gaps, for instance by examining the continuum from unpassionate to highly passionate founders of companies (e.g., Cardon, Gregoire, Stevens, & Patel, 2013) and by providing both self-report and other-report measures of entrepreneurial passion (Cardon, Sudek, & Mitteness, 2009; Cardon et al., 2013), as well as distinguishing between laymen's implicit passion concepts and the scientific definitions of passion (e.g., Cardon, Wincent, Singh, & Drnovsek, 2009; Cardon, Sudek, & et al., 2009). Although these are highly relevant directions for the research on passion for work in general, they have so far remained limited to the context of entrepreneurship.

We see the following gaps in the research on work passion: (1) a lack of large and diverse samples allowing for examination and comparison of the prevalence of passion across different industries and demographic groups, (2) a lack of comparisons between highly passionate and non-passionate individuals, across industries, (3) a lack of passion measures distinguishing between specific facets of passion, and (4) a predominance of inter-individual methods that do

not show intra-individual patterns of passion and relevant outcomes. To address these gaps, the present study uses a large dataset of the U.S. workforce including distributions of demographic groups and industries comparable to the overall workforce. This enables us to conduct the first, to our knowledge, systematic examination of whether passion levels differ across employee characteristics (e.g., socioeconomic status, age), or work characteristics (e.g., job experience, industry, objective characteristics of the nature of work). The present study uses a multi-method approach, combining Likert-type rated items, open-ended questions, and relatively objective information about the nature of participants' work based on O*NET data (Peterson et al., 2001). We apply different passion measures to distinguish specific facets of passion and to avoid common method bias. In doing so, we use a passion scale that integrates consensual components of different passion concepts, based on a comprehensive review of previous passion research (see Moeller, 2014; Moeller, Eccles, et al., 2015). Inter- and intra-individual analyses are combined, employees with low and high passion compared, and the prevalence, correlates, and outcomes of passion are compared across scientific and laymen's concepts of passion for work.

2. Methods

2.1 Data collection procedures

Participants were recruited from the panels of the survey provider Qualtrics. To recruit a demographically representative sample, Qualtrics used quotas reflecting representative distributions of gender, geographical region, race/ethnicity, and age in the U.S. workforce, according to the U.S. Bureau of Labor Statistics (2013 – 2016; for comparisons of demographic group prevalences in our sample and the U.S. workforce overall, see Tables S3 and S4 in the supplemental online materials). Participants completed the surveys online.

2.2 Sample

14,645 U.S. employees older than 18 years and living in the U.S. were recruited via Qualtrics panels. The original dataset comprised of 20,079 participants, of which 5,434 participants were removed due to missing two or more of the 13 attention checks (72.94% of the sample remained in the cleaned dataset). Attention checks were items mixed into the survey that prompted participants to click on a predefined answer (e.g., “Select the 'never / almost never' choice here, please.”). The sample consisted of 50.59% male participants, 49.22% female, and 0.18% reported ‘other’ gender identities. Data were available from all 50 states. The sample was 82.68% White/Caucasian, 9.40% Black/African-American, 4.23% Asian/Asian-American, 1.87% American Natives or Alaska Natives and Native Hawaiian or other Pacific Islanders, 2.20% Biracial or Multiracial, and 2.40% reported other identities. 9.78% identified as Hispanic/Latino, 90.22% did not. Participants were on average 40.78 years old ($SD = 14.10$, $min = 18$; $max = 96$). The average subjective socio-economic status was 5.53 ($SD = 2.30$); ranging from 0 (worst off) to 10 (best off), using the Ostrove, Adler, Kuppermann, and Washington (2000) scale. Participants worked an average of 39.81 hours weekly and held, on average, two jobs.

2.3 Measures

Passion was measured using three approaches, the first of which was the short form of the “commitment and passion scale” freely available online under a CC BY 4.0 license (Moeller & Grassinger, 2017). This scale has previously been validated and found to be highly correlated with other measures of passion and commitment, including the Dual Model Passion Scale (Vallerand et al., 2003) and measures of commitment (e.g., Scanlan et al., 2009). Based on a comprehensive review of the literature on passion and related constructs, this passion scale

distinguishes between two main facets of passion: commitment and desire. The commitment subscale consists of three more specific subscales: intent/action plans to engage and persist (four items, e.g., “I schedule my everyday life so that I avoid getting interrupted or distracted at work.”; $\alpha = .74$), long-term goals (two items, e.g., “I have plans regarding what I want to achieve at work in the future.”; $\alpha = .70$), and identification (two items, e.g., “I strongly identify with my work.”; $\alpha = .72$). The desire subscale consists of four items (e.g., “Even during my free time, I sometimes crave getting back to work.”; $\alpha = .88$).

The second measure consisted of an item asking participants how often they felt “passionate” at work, with the instruction “*Use the slider to show how often you have felt each of these emotions at work, in the past 3 months*” (response scale from 0 = *Never/Almost never* to 100 = *Always/Almost always*).

Third, participants were asked to report their typical feelings about their work tasks in open-ended responses. *The question was, “Over the last 6 months, how did your job make you feel? Which specific emotions did you experience most frequently because of your specific tasks and responsibilities? List up to three **SPECIFIC** feelings and why you felt this way.”*. We examined how frequently participants mentioned being passionate in these responses.

2.3.1 Correlates

2.3.1.1 Emotions, Resources, Co-variates and Outcomes

Emotions were assessed with two different methods: The open-ended responses mentioned above and Likert-type scaled items (see Table 1). For the rated measures, participants were asked to “*Use the slider to show how often you have felt each of these emotions at work, in the past 3 months*,”. The items were chosen to capture positive and negative emotions that previous research has linked to relevant work outcomes and therefore included feelings related to work

pressure and dealing with colleagues (overwhelmed, safe), social emotions (guilty, envious, connected, respected), as well as items that typically appear in classic emotion measures, such as the PANAS (e.g., happy, angry; e.g., Watson & Clark, 1994).

Table 1: Measures for demands, resources, co-variates and outcomes

Construct	Item #	Example item	Response scale	α
[E] positive emotions		interested, proud, confident, inspired, happy, connected, respected, content, and safe	0 = <i>Never/Almost never</i> to 100 = <i>Always/Almost always</i>	.93
[E] negative emotions		bored, afraid, discouraged, indifferent, frustrated, disgusted, stressed, angry, guilty, envious, tense, overwhelmed, and miserable		.92
[D] Creativity demand	3	My job requires me to be creative.	1 = <i>Strongly disagree</i> - 6 = <i>Strongly agree</i>	.87
[D] Unethical climate	3	Have you been pressured to work in a way that went against the standards for good conduct in your industry?		.93
[D] Cumbersome bureaucracy	5	My work has too many rules about how tasks have to be done.	1 = <i>Never/Almost never</i> - 6 = <i>Always/Almost always</i>	.88
[D] Fear of speaking up	6	I am afraid of getting punished for expressing even constructive criticism.		.93
[R] Creativity support	4	Creativity is encouraged and rewarded.		.89
[R] Purpose and meaning	3	I find my work meaningful.	1 = <i>Never/Almost never</i> - 6 = <i>Always/Almost always</i>	.79
[R] Rewards and recognition	3	I am compensated well for my work.		.79
[R] Job security	6	My job will be there as long as I want it., roughly adapted from Rothmann, Mostert, & Strydom (2006)		.80
[C] Engagement	6	I strive as hard as I can to complete my job., subscale of 'physical engagement' by Rich, Lepine, & Crawford (2010).	1 = <i>Never/Almost never</i> - 6 = <i>Always/Almost always</i>	.92
[C] Job satisfaction	3	I am satisfied with my work situation.		.94
[O] Identification with the organization	6	When someone praises this organization, it feels like a personal compliment. based on affective commitment by Mayer, Allen, and Smith (1993)	1 = <i>Completely disagree</i> - 7 = <i>Completely agree</i>	.90
[O] Skill acquisition	2	e.g., How many skills have you acquired at this job that you could put on your resume?	0 = <i>None</i> - 4 = <i>Four or more</i>	.70
[O] Employee	5	asking participants to indicate how many		.92

creativity and innovation		times they engaged in five creative/innovative work behaviors in the previous six months, adapted from Zhou & George, (2001); e.g., “ <i>Suggested new ideas in meetings/work teams</i> ”		
[O] Turnover intentions	3	I am planning to search for a new job during the next 12 months.	1 = <i>Strongly disagree</i> - 6 = <i>Strongly agree</i>	.87
[O] Absenteeism	5	How many days of work have you missed because you decided not to go to work without having an excused reason in the last year? (includes voluntary and involuntary absence)	0 = <i>None</i> - 5 = <i>Five or more</i>	.86
[O] Burnout	4	I feel used up at the end of the day., emotional exhaustion items selected from Maslach & Jackson (1981)	1= <i>Never/Almost never</i> - 6 = <i>Always/Almost always</i>	.93

Note. [D] = demands, [R] = resources, [C] = covariates, and [O] = outcomes.

2.3.4 Predictors

Gender was assessed with the question “What is your gender?” with the response options “male”, “female”, and “other”. For the regressions reported in this study, we only examined the two large groups of male- and female-identified participants.

Subjective socio-economic status was measured with the question, “Think of a ladder with 10 steps representing where people stand in the United States. At step 10 are people who are the best off – those who have the most money, the most education, and the most respected jobs. At step 0 are the people who are worst off – those who have the least money, least education, and the least respected jobs or no job”. Ostrove, Adler, Kuppermann, and Washington (2000) validated this measure by showing its links to household income, education, and occupation.

Rank in the organization was assessed with the question, “What is your rank / position in the hierarchy of the organization where you work? Think of a ladder with 10 steps representing where people stand in your organization. At step 10 are people who are at the top of hierarchy – those who are at the chief executive/director level (such as the CEO or director). At step 0 are the

people who are at the bottom of the hierarchy – those who are at the entry level (such as newcomers or recent graduates). Where on this ladder would you position *yourself*?”

Industry of a participant's job was assessed with the question “Which industry category best captures the activities of the organization for which you work?”, with 21 response options, based on supersectors in the North American Industry Classification System (NAICS; see **Figure 7**).

Objective job characteristics concerning creativity and persistence were obtained from the Occupational Information Network (O*NET; Peterson et al., 2001). The O*NET is an online database of occupations providing information for about different occupations. Our survey asked participants about their occupation in a way corresponding to O*NET codes of occupations. In this article, we focus on O*NET information theoretically linked to passion, namely typical level of creativity in the job and the importance of persistence in the job. The O*NET values for the *level of creative thinking required in an occupation* (i.e., “Developing, designing, or creating new applications, ideas, relationships, systems, or products, including artistic contributions”; onetonline.org) are rated on a scale from 1 to 100, with higher values indicating greater creativity requirements. Values for the *importance of persistence in the face of obstacles in an occupation* provided by O*NET range from 1 to 100, with higher values corresponding to greater importance of required persistence in the face of obstacles. 5,090 participants did not report their occupation entirely and had consequently missing data on their O*NET variables.

3. Theory

1.1 What is passion?

While there are a numerous definitions and measures of passion in the previous literature (for overviews, see e.g., Moeller, 2014; Newman, Obschonka, Moeller, & Chandan, under review),

we base this article on the definition of passion proposed by Moeller and Grassinger (2014) that resulted from a comprehensive literature review. In line with their review, we define passion as a multifaceted construct including a long-term committed and urging inclination of a person towards an activity. One facet of that definition of passion is commitment, a form of persistent and long-term motivation; see Rusbult, Martz, and Agnew (1998) and Scanlan, Russell, Magyar, and Scanlan (2009) that consists of the sub-facets ‘continuous intent/action plans to engage and persist’, ‘long-term goals’, and ‘identification with the work/organization (adapted from Rusbult, Martz, & Agnew, 1998). The other facet is desire, a form of urgent, fluctuating, and affect-intense approach motivation. A measure of this definition of passion has been demonstrated to be valid and shows good psychometric properties (Moeller, 2014; Moeller & Grassinger, 2017).

1.2 What does passion feel like and does passion matter for relevant work outcomes?

1.2.1 Passion and emotions: Positive? Negative? Mixed?

There is a debate about whether passion is a positive experience (Cardon, Wincent, et al., 2009), whether passionate individuals experience mutually exclusive predominantly positive experiences or predominantly negative experiences (Vallerand et al., 2003), or whether passion is an ambivalent experience including both positive and negative aspects experienced by the same individual (Moeller, Keiner, & Grassinger, 2015; Wang et al., 2008). Previous studies examining these questions have mostly used limited sets of emotion items, typically relied solely on Likert-type rating emotion measures, and mostly used inter-individual correlational methods to examine the relationship between passion and emotions. Since inter-individual correlations do not examine whether emotions are actually endorsed (affirmed through ratings above the mid-point of the response scale), it is unknown how often positive, negative, or mixed emotions are experienced (i.e., affirmed) by passionate versus unpassionate employees. Intra-individual and

more diverse methodological approaches are needed to understand the exact relation of passion to emotions (Moeller, Eccles, Salmela-Aro, Dietrich, Schneider, & Grassinger, 2015). In this study, we therefore combine commonly rated emotion items with open-ended questions about employees' feelings about their work tasks. In addition to correlations and regressions, we examine how often highly passionate employees endorse specific emotions and how often they report which specific mixed emotions, using a novel approach of co-endorsement network analysis recently developed for that purpose (Moeller, Ivcevic, White, & Brackett, 2018).

1.2.2 Work passion and the job demands-resources model

Long before the emergence of research on passion for work, another multifaceted motivational construct had been established in the research on work motivation, namely the construct of engagement, which is embedded in the job demands-resources model (Bakker & Demerouti, 2007; Gorgievski-Duijvesteijn & Bakker, 2010). This model states that job resources predict engagement which in turn leads to desirable job outcomes, such as satisfaction ("engagement pathway"; e.g., Halbesleben & Wheeler, 2008; Harter, Schmidt, & Hayes, 2002; Salanova, Agut, & Peiro, 2005; Nahrgang, Morgeson, & Hofmann, 2011; Schaufeli, Taris, & Bakker, 2006). In contrast, job demands predict strains, which lead to negative work outcomes, such as burnout, which in turn lead to depression ('strain pathway'; Bakker & Demerouti, 2007). Recent studies have integrated the dual model of passion with the job demands-resources model. Consistent with the idea of two pathways, one study found that harmonious passion was a mediator between job resources and work engagement, whereas obsessive passion was a mediator between job demands and burnout (Trépanier, Fernet, Austin, Forest, & Vallerand, 2014). A different study found that obsessive passion indirectly predicted burnout via the mediator of experienced conflicts, whereas harmonious passion buffered against burnout via the

negatively related mediator of job satisfaction (Vallerand, Paquet, Philippe, & Charest, 2010). The studies agree in finding moderate associations between harmonious passion and engagement (Ho, Wing, & Lee, 2011; Mageau & Vallerand, 2007; Trépanier et al., 2014). Given that both constructs overlap in some aspects (positive emotions, their relations to flow experiences, their conceptual closeness to dedication and commitment), it is unclear to what extent passion incrementally adds any explanation to relevant job outcomes beyond engagement. The current study therefore examines the incremental validity of passion over engagement and related constructs, such as positive emotions and job satisfaction.

While much of the previous research treats the engagement and strain pathways as almost mutually exclusive experiences (González-Romá, Schaufeli, Bakker, & Lloret, 2006; Schaufeli, Taris, & Van Rhenen, 2008; Demerouti, Bakker, De Jonge, Janssen, & Schaufeli, 2001), some studies have argued that aspects of both pathways can be experienced together (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007; Crawford et al., 2010; Hakanen, Bakker, & Demerouti, 2005; Van den Broeck et al., 2012). For example, Moeller, Ivcevic, White, Menges, et al. (2018) found that one in five employees, and one in three highly engaged employees, reported high levels of both engagement and burnout, and that these employees were more likely than others to experience combinations of high job demands and high resources. In line with this finding, several studies found that inter-individual analyses may overlook subgroups of individuals who function differently than the correlation suggests (e.g., Molenaar, 2004; Reitzle, 2013). We therefore expect that some employees may experience high passion for work together with both high levels of engagement and high levels of burnout and stress-related emotions.

1.3 Who experiences a passion for work?

To the best of our knowledge, it is not known which demographic groups and which industries are likely to experience high levels of passion for work. The prevalence of passion for work is unknown, because most studies do not include representative samples of workers and instead focused on a single industry or single type of business activity, like founding or developing businesses (Mitteness et al., 2012; Vallerand, Paquet, Philippe & Charest, 2010), or a single organization (Forest, Mageau, Sarrazin, & Morin, 2011; Ho et al., 2011). For example, Vallerand et al. (2010) report that 88% of the nurses in Canadian hospitals on average affirmed the general passion criteria of the Dual Model Passion Scale (finding work important, spending time and energy with, liking work, calling work a passion, identifying with work). Passion for work has been studied in teachers, nurses, entrepreneurs, service industry, and professional sports (Forest et al., 2011; Ho et al., 2011; Mitteness et al., 2012; Vallerand et al., 2010), but the levels of passion have not yet been compared systematically across industries and demographic groups. Therefore, this study compares the level of passion across demographic groups (gender, age, socioeconomic status, rank in organization, time spent in organization) and industries.

Some researchers suggested a link between passion and creativity (Amabile, 2001; Amabile & Fisher, 2009; Averill, 2002; Csikszentmihalyi, 1996), but this theoretical link has rarely been tested empirically. Previous studies mostly examined the relationship of passion to creativity and innovation in the context of entrepreneurship (Cardon et al., 2013; Kang et al., 2016; Ma et al., 2017; Shockley & Turner, 2016). Since we do not know of any previous study that has examined this relationship across industries, this study examines whether the level of creativity typical in the employees' occupation predicts passion, using objective O*NET job characteristics.

1.4 The present study; research questions

The present study aims to examine the prevalence and meaning of passion in the U.S. workforce. For that purpose, we examine three main research questions: (1) How passionate are U.S. workers overall?, (2) What does it feel like to be passionate about work?, and (3) Who are the most and least passionate workers? Each of these research questions is examined with a multi-method approach, addressing the following aspects:

RQ1: The prevalence of passion in the U.S. workforce is investigated by examining how many employees describe themselves as passionate about their work tasks in open-ended responses and how many employees endorse passion on rated items (a passion scale and a single item asking about the frequency of feeling ‘passionate’).

RQ2: What it feels like to be passionate is studied by examining the association of passion to emotions, job demands, and job resources, using inter- and intra-individual approaches with both emotion rating scales and open-ended emotion responses.

RQ2a: How do emotion ratings correlate with passion, and how often do employees report a strong passion for work together with high positive, high negative, and high mixed emotions in rated scales?

RQ2b: How does passion correlate with job resources and job demands? We expected positive relations with job resources, negative relations with hindrance job demands (e.g., bureaucracy) and low or insignificant correlations with challenge job demands (e.g., creativity demands).

RQ2c: Does passion for work matter, meaning does it contribute incrementally to the explanation of relevant work outcomes after related constructs are taken into account?

RQ3: Who is passionate was studied by examining the relationship between passion and demographic characteristics of U.S. workers, including their age, socioeconomic status (SES), rank in the organization, time they have worked in the organization, gender, and industry, as well as objective O*NET indicators of job characteristics that are expected to be linked to passion (level of creative thinking and importance of persistence at the kind of job held by the employee). We expected positive relationships between people's passion for work and their creativity based on the theoretical propositions discussed by Amabile (2001; Amabile & Fisher, 2009), Averill (2002), and Csikszentmihalyi (1996). The importance of the work style "persistence" in a workplace was expected to predict passion, because jobs that require persistence are likely to attract and retain persistent employees, and persistence is a crucial component of passion according to several reviews and definitions (e.g., Moeller, 2014).

3. Analyses and Results

Means, standard deviations, and internal consistencies for all measures, including the average passion levels in the U.S. workforce can be found in the descriptives Table S1 in the appendix.

3.1 How passionate are U.S. workers overall? (RQ1)

First, we examined how often employees mentioned the term passion when asked to describe in their own words how they feel about their work *tasks*. In open-ended responses, only 20 individuals (0.1%) reported feeling passionate or equivalent versions of the term passion about their work tasks. Since it seems possible that passionate employees feel a variety of feelings without passion necessarily being one of the most salient ones, it could be argued that the low salience of the term passion in the open-ended responses is insufficient evidence for the assumption that individuals rarely feel passionate about their work. Therefore, we examined in

the next step how many individuals endorsed the rated item capturing their frequency of feeling ‘passionate’. We dichotomized the responses at the scale midpoint (50) and treated scores above the scale midpoint as an endorsement. The endorsement for the item passionate was quite frequent, with 64.63% of all participants responding above the scale midpoint. In a similar procedure, we dichotomized the total score of the passion scale at the midpoint (3.5) and found that 75.62% of participants affirmed being passionate at work. The different subscales of the passion scale differed in their frequency of being endorsed by the participants: The mean score and number of endorsements was higher for the intent subscale ($M = 4.37$; endorsed by 77.81% of the employees) and the other scales forming the commitment subscale (long-term goals and identification; $M = 3.94 - 4.15$; endorsed by 57.09% – 66.10% of the employees, and lowest for the desire subscale ($M = 3.51$; endorsed by 50.04% of the employees).

3.2 What does it feel like to be passionate about work? (RQ2)

3.2.1 How do emotion ratings correlate with passion? (RQ2a)

The passion scale correlated positively with positive emotions (e.g., $.19^{*1} \leq r \leq .48^{*}$ for the passion total score; see Figure 1). In contrast, the relationship of passion to negative emotions was more complex: Several negative emotions were unrelated or weakly negatively correlated with the passion scale, such as stress-related feelings (stressed, overwhelmed, and tense; $-.12^{*} \leq r \leq -.05^{*}$ for the passion total score). The low arousal negative emotions (bored, indifferent), as well as the high arousal emotion of anger, showed slightly stronger negative correlations with the passion scale ($-.25^{*} \leq r \leq -.17^{*}$ for the passion total score).

¹ We employ only one convention for significance p values, $p \leq 0.05$, in this article. Therefore, only one asterisk is used no matter whether p was ≤ 0.05 , ≤ 0.01 , or ≤ 0.000 , throughout this article.

Figure 1. Correlations of passion with positive (left) and negative (right) emotions. Insignificant correlations are crossed out.

3.2.2 How often do employees report a strong passion for work together with high positive, high negative, and high mixed emotions? (RQ2a)

That we found no strong systematic relation between passion and stress-related negative emotions implies that it might be possible for passion to co-occur with both high and low levels of certain negative emotions. In order to understand these possible mixtures of passion and negative emotions better, we next examined how often high passion co-occurs with high versus low levels of negative, positive, and mixed emotions, using co-endorsement network analyses. For that purpose, we employed the procedure proposed by Moeller, Ivcevic, White, Menges, et al., (2018). In this procedure, all measures are first dichotomized at the point that best distinguishes between item endorsement and item rejection (typically the scale midpoint). Second, we counted how often one variable was endorsed together with another variable by the same individual, which becomes the so-called edge weight (thickness of the line) in the resulting graph depicting the co-endorsements of these two variables. This was done for all pairwise combinations of all the emotion and passion variables, so that a network of co-endorsements resulted. We used Gephi, version 0.9.2 (Bastian, Heymann, & Jacomy, 2009) to automatically count, plot, and further analyze the pairwise co-endorsements.

The advantage of this co-endorsement network approach, compared to correlation-based analyses, is that it provides information on *how frequently an individual co-endorses* a variable (here: passion) together with another variable (here: different emotions). Correlations do not provide this information, since a correlation can be significant and large without either of the correlated variables ever being endorsed. Likewise, a correlation can be negative, while a substantial subgroup of individuals nevertheless endorses both variables (see e.g., Moeller, Ivcevic, White, Menges, & et al., 2018; Van den Broeck et al., 2012). Since we aimed to find out

which emotions were experienced (i.e., endorsed) by highly passionate individuals, the co-endorsement network analysis was the best suited method. We selected only the most passionate individuals (fourth quartile of the total score of the passion scale) and then dichotomized all subscales of the passion scale and the rated emotions.

The resulting overall network consisted of 27 nodes (four passion subscales, ten positive emotions, and thirteen negative emotions) and of 433,079 edges or co-endorsements. We created three network figures, one displaying the co-endorsements of passion measures with positive emotions (Figure 2, left), one displaying the co-endorsements of passion measures with negative emotions (Figure 2, middle), and one displaying the co-endorsements among mixed emotions (co-endorsed pairs of emotions with opposite valences; Figure 2 right). The size of the nodes (measures) is proportional to their weighted node degree (= the sum of the node's weights) within its network. That means that within the subsample of highly passionate employees, the size of a red node in the left network in Figure 2 is proportional to the sum of the co-endorsements of this positive emotion with all passion measures combined; the size of a blue node in the middle network in Figure 2 is proportional to the sum of the co-endorsements of this emotion with all passion measures combined; and the size of the red and blue nodes in Figure 2 right is proportional to the sum of times each emotion was co-endorsed with all emotions of the opposite valence combined. For example, in the network of co-endorsements between passion measures and negative emotions (Figure 2, middle), the negative emotions stressed, tense, overwhelmed, and frustrated, are relatively large nodes compared to other negative emotions, because they were more likely to be co-endorsed with passion measures than the negative emotions with smaller node sizes, such as boredom or guilt. The edges tables for the three

network figures, including edge weights for all pairwise combinations of emotions displayed in Figure 2, are reported in the supplemental online materials (Tables S5 – S7).

Figure 2. Co-endorsement network of passion with positive emotions (left) and negative emotions (middle) and mixed emotion co-occurrences (right) in highly passionate employees (in 4th quartile of the passion total score)

The vast majority of the highly passionate employees co-endorsed the different passion subscales together with the positive emotions (see Table S5 in the supplemental online materials **Error! Reference source not found.**). Larger nodes like interested and confident were relatively more likely to be co-endorsed with passion measures, while small nodes such as content, connected, and inspired, were comparably less likely. The most frequent co-endorsement of a passion measure and a positive emotion was the co-endorsement of the passion desire subscale with the feeling of confidence, which were co-endorsed by 87.21% of all highly passionate employees. The least frequent co-endorsement of a passion measure and a positive emotion was the co-endorsement of the single item of feeling ‘passionate’ and the feeling of contentment, which were co-endorsed by 68.01% of the highly passionate employees. The size of the emotion nodes in Figure 2, left, gives a quick overview of the overall co-endorsements of

any positive emotion with all passion measures. The emotion ‘interested’ is the largest node, indicating its more frequent co-endorsements with passion measures, compared to the co-endorsements of other emotions with passion measures.

Co-endorsements of passion subscales with negative emotions were less frequent than co-endorsements of passion subscales with positive emotions, but nevertheless, almost one out of two highly passionate participants co-endorsed passion measures and at least one negative emotion. In particular, stress-related emotions (feeling stressed, overwhelmed, and tense) were frequently co-endorsed with passion subscales (37.58% – 46.41% of the highly passionate participants; Figure 2, middle). The least frequent co-endorsement of a passion measure with a negative emotion was the co-endorsement of the single item of feeling passionate and the negative emotion of feeling guilty (8.01% of the highly passionate employees).

After examining how often passion measures were co-endorsed with positive and negative emotions by highly passionate employees, we examined how many highly passionate employees experienced mixed emotions, meaning high levels of positive and negative emotions together. The results are displayed in Figure 2 right. About one out of three highly passionate employees reported mixed emotions. The negative emotions most frequently co-endorsed with a positive emotion were stress, overwhelmed, and tense (21.29% – 38.21% of all highly passionate employees; see Figure 2 right and the edges tables in supplemental online materials). The least likely mixed-emotion pair to be co-endorsed by highly passionate employees was the combination of the feelings content and envious (12.27% of the highly passionate employees).

In this network, node sizes should only be compared among nodes of the same valence, as the generally larger size of red versus blue nodes reflects the larger number of negative (13) than positive (10) emotions. Larger blue nodes (negative emotions), such as stress or frustration, were

more frequently co-endorsed with positive emotions overall, compared to smaller blue nodes, such as guilt or envy. Vice versa, the larger red nodes, such as interest, were more frequently co-endorsed with negative emotions overall, compared to smaller red nodes, such as contentment.

3.2.3 Which emotions do passionate, and unpassionate, employees experience, based on their open-ended responses? (RQ2a)

Since associations among different self-reported variables like those reported above raise concerns about common method biases, we additionally used open-ended responses to examine passionate employees' emotions about their work tasks. This also gave us the opportunity to learn more about the full scope of passionate employees' emotions at work by examining all the feelings that come to people's minds when describing their work tasks. We compared employees with high, moderate, and low levels of passion for work on their open-ended responses about their feelings about their work tasks. For that purpose, we created quartiles of passion based on the total score of the passion scale (i.e., a group of the 25% least passionate employees, a group of the 25% most passionate employees, and two groups of the 25% employees with moderately low passion and moderately high passion, respectively). Then, we compared the quartiles in regard to the percentages of positive, negative, and neutral terms mentioned in open-ended responses.

Each open-ended answer was coded, identifying a total of 1,069 different feeling terms. Most participants mentioned one term per field, such as "stressed", "stress", or "stressed out". Such terms were collapsed into one label (in this case: stressed). Some participants wrote longer answers, such as "I feel happy" and "Most of the time I feel happy" and these answers were coded into the corresponding key label (happy). The 1,069 unique responses were each rated for valence (negative, neutral, or positive) by five raters (*Fleiss' kappa* = .85). Terms that received unanimous ratings or for which there was only one disagreement were scored according to the

majority. Two raters discussed and assigned valences to terms for which there was more than one disagreement ($N = 79$). Ten responses were deemed inappropriate to code for valence (e.g., babysitting, manager, money).

Figure 3. Percentages of positive, negative, and neutral feelings words in the open-ended responses about feelings at work. Q = Quartile

Figure 3 shows that individuals in the low passion quartile reported about twice as many negative feelings (67.96%) as positive feelings (31.40%) when asked to describe in their own words how they typically feel about their work tasks. The picture reverses for individuals in the high passion quartile, who report about twice as many positive (63.59%) as negative (35.60%) feelings. Importantly, the fourth quartile shows that employees with high passion do not report purely positive feelings, but they are likely to report a mixture of positive and negative feelings, in which the positive feelings outscore the negative feelings 2:1.

3.2.4 Relations of passion measures to job demands and resources (RQ2b)

To understand how different passion measures were related to job demands and resources, we examined their zero-order correlations. The passion scale total score, as well as all subscales

were positively related with job resources, with small to moderate effect sizes, including perceived purpose and meaning ($.35^* \leq r \leq .53^*$), the experience of creativity support ($.33^* \leq r \leq .49^*$), rewards and recognition ($.30^* \leq r \leq .43^*$), and job security ($.21^* \leq r \leq .36^*$).

In contrast, the passion subscales and total score were not related or weakly negatively correlated with several job demands, such as cumbersome bureaucracy ($-.14^* \leq r \leq .01$) and the fear of speaking up ($-.24^* \leq r \leq -.02^*$). Unethical climate showed inconsistent correlations, weakly negative to weakly positive with different passion measures ($-.05^* \leq r \leq .15^*$). Creativity demands, in contrast, were positively correlated with passion measures, with small to moderate effect sizes ($.38^* \leq r \leq .51^*$). The weak correlations between passion measures and different demands suggest that some employees experience high passion together with high demands, while others experience high passion together with low demands.

Figure 4. Correlations of passion with job resources job attributes (left) and job demands (right).

Insignificant correlations are crossed out

1.2.5 Does passion matter? Incremental validity of passion

Next, we examined whether passion incrementally contributed to the prediction of relevant outcomes, beyond the aspects explained by related constructs, such as engagement, positive emotions, and overall job satisfaction. We investigated this question in regard to six different outcomes: engagement-pathway outcomes (skill acquisition, employee's creativity and innovation), strain-pathway outcomes (turnover intentions, absenteeism, burnout), and a component of commitment that was used as a validation criterion (identification with the organization).

The incremental validity of the passion scale was tested in hierarchical linear regression analyses with engagement, positive emotions, and overall job satisfaction as predictors in the first step, and passion facets as well as the single item capturing the frequency of feeling 'passionate' added in the second step. To examine whether distinguishing between the facets of commitment and the facet of desire contributed any incremental insights, we examined the partial contributions of these two facets to the prediction of relevant work outcomes.

As Table 6 shows, passion contributed significantly to the prediction of creativity ($\Delta R^2 = .10$; $p < .001$), identification with the organization ($\Delta R^2 = .06$; $p < .001$), and although statistically significant, at lower levels to the prediction of skill acquisition ($\Delta R^2 = .03$; $p < .001$), absenteeism ($\Delta R^2 = .02$; $p < .001$), turnover intentions ($\Delta R^2 = .01$; $p < .001$), and burnout ($\Delta R^2 = .01$; $p < .001$). Interestingly, passion measures were *positive* incremental predictors of the positive as well as the outcomes, after engagement, positive emotions and job satisfaction were taken into account. However, passion's incremental contribution to the explanation of the negative outcomes it weak, as indicated by small changes in the R^2 ($.01 \leq \Delta R^2 \leq .03$).

While the commitment subscale was a stronger predictor of the positive outcomes than the desire subscale and the feeling ‘passionate’ single item, the desire subscale was a stronger predictor of the negative outcomes of turnover intentions and absenteeism, and an equal (weak) predictor of burnout. In contrast to desire and the passionate single item, the commitment subscale did not add unique explanation to the prediction of turnover intentions and absenteeism. The single item of feeling ‘passionate’ was not an incremental predictor of identification with the organization.

Table 1

Incremental validity of passion: Hierarchical linear regression analysis

Predictor		β	t	R^2	$Adj-R^2$	ΔR^2	F	ΔR^2	β	t	R^2	$Adj-R^2$	ΔR^2	F	ΔR^2
		Employee's identification with organization ($N = 2,844$)						Employee's turnover intentions ($N = 14,645$)							
$S1$	Positive emotions	.23*	10.289						-.15*	-14.94					
	Engagement	.15*	9.450	.33	.33	.33*	453.79		.04*	5.27	.35	.35	.35*	2476.56	
	Overall job satisfaction	.33*	14.591						-.48*	-49.66					
$S2$	Positive emotions	.13*	5.064						-.18*	-15.62					
	Engagement	.05*	2.642						.01	1.46					
	Overall job satisfaction	.25*	11.274	.39	.39	.06*	86.12		-.50*	-50.23	.35	.35	.01*	54.68	
	Desire (com.pass)	.06*	2.853						.08*	8.59					
	Commitment (com.pass)	.25*	10.107						.02	1.35					
	'Passionate' single item	.05	1.062						.03*	2.67					
		Employee's skill acquisition ($N = 14,645$)						Employee's absenteeism ($N = 14,645$)							
$S1$	Positive emotions	.17*	15.20						.04*	3.05					
	Engagement	.20*	23.98	.14	.14	.14*	746.73		-.17*	-19.93	.03	.03	.03*	153.55	
	Overall job satisfaction	.11*	10.13						-.05*	-4.22					
$S2$	Positive emotions	.07*	4.87						-.05*	-3.06					
	Engagement	.11*	12.38						-.22*	-23.02					
	Overall job satisfaction	.07*	6.00	.17	.17	.03*	186.28		-.07*	-5.90	.05	.05	.02*	104.75	
	Desire (com.pass)	-.05*	-4.54						.13*	11.57					
	Commitment (com.pass)	.24*	18.92						.02	1.46					
	'Passionate' single item	.09*	7.32						.07*	5.32					
		Employee's creativity and Innovation ($N = 14,645$)						Employee's burnout ($N = 14,645$)							
$S1$	Positive emotions	.22*	19.29						-.24*	-26.15					
	Engagement	.18*	21.63	.11	.11	.11*	574.60		.22*	32.51	.44	.44	.44*	3634.62	
	Overall job satisfaction	.02	1.45						-.50*	-54.88					
$S2$	Positive emotions	.05*	3.53						-.32	-28.95					
	Engagement	.04*	4.72						.18*	24.83					
	Overall job satisfaction	-.06*	-5.40	.21	.21	.10*	600.96		-.51*	-55.45	.45	.45	.01*	78.88	
	Desire (com.pass)	.12*	11.29						.04*	4.93					
	Commitment (com.pass)	.28*	22.44						.04*	3.48					
	'Passionate' single item	.12*	10.25						.09*	9.88					

Notes. S1 = step 1; S2 = step 2; Desire and Commitment are subscales of the 'Commitment and Passion Scale', meaning facets of passion; *: $p \leq .05$.

3.3 Who are the most, and least, passionate workers? (RQ3)

To find out whether characteristics of the employees or their workplaces predicted employees' levels of passion, we used structural equation models (using the R package “lavaan”, Rosseel, 2012, with a robust estimator; MLR).

As predictors, we chose stable characteristics of the person and job that were relatively static and likely to precede or be independent of passion, like demographic variables (age, gender, socioeconomic status), rank and years worked in the organization, as well as objective job attributes in terms of O*NET ratings of the employees' main occupation related to the level of creative thinking and the importance of persistence in the job type reported by the employee.

Figure 6: Do demographic characteristics predict employees' passion? Left: Passion as latent outcome variable, with com.pass subscales as indicators; Right: The frequency of feeling 'passionate' as manifest single item. * : $p \leq .05$.

Age and time spent at the organization: Age was unrelated to passion, whether passion was measured as a latent variable based on the com.pass subscales ($\beta = -.01$), or as a single item asking employees how frequently they felt passionate ($\beta = .01$). The amount of time an employee had

worked for the organization was weakly negatively associated with the latent passion variable ($\beta = -.08^*$), but unrelated to the single item of feeling 'passionate' ($\beta = .01$).

Subjective socioeconomic status and rank in the organization: As *Figure* shows, the subjective socioeconomic status (SES) predicted passion, both measured as a latent variable based on the com.pass subscales ($\beta = .18^*$), and measured as a single item asking employees how frequently they felt passionate ($\beta = .07^*$). Similarly, the employee's rank in the organization was a significant predictor of passion, measured as latent passion variable ($\beta = .27^*$), and single passion item ($\beta = .08^*$, see *Figure*). Although these effect sizes for the overall ('omnibus') association between passion and SES, as well as passion and the rank in an organization, were small, there was a steady increase in passion with every level of the 11-point measures of SES and organizational rank, with a *large* mean-score difference between the passion of the lowest SES and rank group and the passion of the largest SES and rank group (see *Figure 6*). The mean level difference in passion (measured as the manifest total score of the passion scale) between the lowest SES level ($M_{passion} = 3.15$; $SD_{passion} = 1.35$) and the highest SES level ($M_{passion} = 4.79$, $SD_{passion} = 1.06$) was very large ($d = 1.35$). Likewise, the mean level difference in passion between the lowest organizational rank group ($M_{passion} = 3.10$; $SD_{passion} = 1.25$) and the highest organizational rank group ($M_{passion} = 4.76$, $SD_{passion} = 0.95$) was very large ($d = 1.50$).

Figure 6. Passion scores (com.pass scale total score) by SES (above) and rank in the organization (below)

Gender was not a significant predictor of either passion measure.

Job characteristics: We examined the association between the nature of employee's jobs and their passion in two steps: First, we examined relationships between passion and the two O*NET job characteristics that we had hypothesized to be associated with passion, namely the importance of persistence in the employees' job category and the level of creative thinking typically required by jobs like the employees' reported job category. As *Figure* shows, the level

of creativity typical for an employee's reported job was a significant but weak predictor of both the latent passion scale variable ($\beta = .06^*$) and the 'passionate' single item ($\beta = .04^*$). In contrast, the importance of persistence typical for the reported job category was related only to the single item ($\beta = .04^*$), but not to the latent passion scale variable.

Finally, we examined the direct differences between 21 industries in their overall passion. As Figure 7 shows, the most passionate industry sector across all measures was the management of companies and enterprises, with a $M(SD)$ between .67(.24) and .75(.18) for the different passion measures (see Table S2 in the supplemental online materials). In contrast, the least passionate industries differed between passion measures, with several industry sectors showing very similar low to average passion levels. The lowest passion scale total scores were observed in administrative support, waste management and remediation services, public administration, and other services (except public administration) (Figure 7). The commitment subscale was lowest in the retail trade, the transportation and warehousing industry, accommodation and food services, public administration, and 'other services (except public administration)' (all $M = .60$, Figure 7).

Figure 7. Passion levels (com.pass scale) by industry²

4. Discussion

4.1 Conclusions

This study examined passion for work in a large sample of the U.S. workforce, guided by three main research questions: (1) How often does the U.S. workforce experience passion for work?, (2) What are the correlates, and outcomes, of passion for work in the U.S. workforce?, and

² The box plots for the single item of ‘feeling passionate’ looks similar, compare *Table S*).

(3) Which characteristics of workers and workplaces determine whether workers experience a high or low passion for work?

4.1.1 How often does the U.S. workforce experience passion for work?(RQ1)

To our knowledge, this was the first study examining the prevalence of passion in a nearly representative sample across industries. We used a multi-method approach and found that rated measures and open-ended responses differed in the frequency of reported passion. The majority of employees endorsed passion on rated measures: 64.63% of employees endorsed the single item capturing the frequency of ‘passionate’ feelings at work and 75.62% of the employees endorsed, on average, the passion scale. In contrast, employees were unlikely to use passion as a descriptor for their typical feelings about their work tasks in open-ended responses; Only about one in a thousand U.S. workers spontaneously used this term. The likelihood of reporting passion for work differed by demographic groups, as is discussed below (RQ3).

That passion was rarely mentioned in open-ended responses contrasts with the frequent endorsements of passion on the rated measures. One reason for rare references to passion in open-ended responses could be that, even for the most passionate employees, passion is not the most salient feeling that comes to mind when thinking about work. Common terms are likely to be mentioned first in open-ended responses (Benedek & Neubauer, 2013; Piers & Kirchner, 1971) and the more basic feelings of happiness, anger, stress, and tiredness were mentioned the most frequently. It may be that people who are passionate for work did not have a chance to state that in their open-ended responses because of other more dominant (and more high frequency) responses coming to their minds first (such as passion, which is used more often than passion in the English language; <https://www.wordfrequency.info/free.asp?s=y>).

In contrast, the rather frequent endorsement of passion across industries did not surprise us. Previous studies by Vallerand and colleagues have repeatedly found frequent endorsements of passion in their samples. For instance, their study showing that 88% of the assessed Canadian nurses endorsed the general passion criteria of the Dual Model Passion Scale (Vallerand et al. 2010). This finding is in line with previous research on job crafting, which suggests that individuals are able to create a sense of meaning and meaningfulness in their job, even in jobs that are not stereotypically thought of as passion inducing (Wrzesniewski, 2003; Wrzesniewski & Dutton, 2001).

Based on our finding that the fewest people affirmed the facet of desire, it seems that the high endorsement of the passion measure is particularly due to the commitment component of passion, suggesting that passion is driven particularly by the long-term goals and continuous intentions/action plans to engage and persist, rather by rewarding experiences and desire.

4.1.2 What does it feel like to be passionate about work? (RQ2)

Passionate employees predominantly experienced positive emotions, but about one out of three highly passionate employees also reported mixed emotions – co-endorsed positive and negative emotions – in line with the previously proposed concept of passion as an ambivalent experience (e.g., Moeller, Keiner, & Grassinger, 2015). To our knowledge, no study has previously examined the intra-individual patterns of mixed emotions across the range of low to high passionate employees. The mixed emotions described here would have been overlooked if only inter-individual, correlation or regression-based approaches had been applied (see also Moeller, Keiner, & Grassinger, 2015; Wang, Khoo, Liu, and Divaharan, 2008; Wang & Yang, 2008). It would be an interesting new angle to apply similar intra-individual examinations of mixed feelings to the research on entrepreneurial passion, which previously emphasized the

positive emotions of passionate entrepreneurs (e.g., Cardon, Wincent, et al., 2009) or to the Dual Model research on passion for work, which tends to describe harmonious and obsessive aspects of passion as independent or mutually exclusive experiences. In particular, regarding the uncertain, challenging, and risky process that funding a business typically is, we would not be surprised if future studies found that highly passionate entrepreneurs are not those who feel purely bubbly joy about their entrepreneurial activities, but instead report a mixture dominance of positive feelings over the also frequent feelings of stress and anxiety.

Our findings suggest that managers should help highly passionate employees sustain their motivation by helping them develop strategies to effectively cope with the stress and tension that often accompanies a passion for work. In a society and business culture that frequently calls on people to develop, find, and show their passion for work (e.g., Davis et al., 2017; Mitteness et al., 2012), we believe that it is important to be cognizant of the possible negative experiences that can accompany a strong passion for work.

The relations of passion to job demands and job resources further supports the notion of passion as an ambivalent motivation (ambivalent, for both the positive and the negative valence). Again, the associations of passion to positive and desirable experiences (resources) were dominant and positive, while the associations to job demands were more complex. While creativity demands were positively associated with passion, the clear hindrance job demands of cumbersome bureaucracy, unethical climate, and fear of speaking up were weakly negatively or uncorrelated with passion. This is in line with a meta-analysis by Crawford, LePine, & Rich (2010), which distinguished between challenge demands (such as workload, or the creativity demand used here), which were positively related to engagement, and hindrance demands (such as cumbersome bureaucracy), which were negatively related to engagement.

Our findings open new directions for the integration of work passion into the job demands-resources model (e.g., Trépanier et al., 2014; Vallerand, Paquet, Philippe, & Charest, 2010). Some previous studies assumed that employees follow either the engagement pathway leading from job resources to engagement/harmonious passion to positive outcomes, or, mutually exclusive, the strain pathway, leading from job demands to obsessive passion/workaholism to negative outcomes. In line with that idea, many studies have reported negative correlations between engagement and burnout (e.g., González-Romá, Schaufeli, Bakker, & Lloret, 2006; Schaufeli, Taris, & Van Rhenen, 2008; Demerouti, Bakker, De Jonge, Janssen, & Schaufeli, 2001)³. In contrast, we propose that some employees experience *co-occurring* demands and resources, which may cause ambivalent feelings about work. Such employees may experience high job resources and consequently high engagement, while at the same time facing strong job demands, causing the person to feel stressed, overwhelmed, or burned out (see Moeller, Ivcevic, White, Menges, & et al., 2018). This intra-individual co-occurrence of high demands and high resources would explain the co-occurrence of passion with stress-related negative emotions in our findings, the co-occurrence of harmonious and obsessive passion (Moeller, Keiner, & Grassinger, 2015), as well as the co-occurrence of engagement with burnout described in previous studies (e.g., Moeller, Ivcevic, White, Menges, & et al., 2018).

Passion incrementally predicted job outcomes beyond related constructs, including engagement, job satisfaction, and positive emotions, which is especially remarkable considering how well established, for example, the engagement construct is in the management literature and business consulting practices (Bakker & Demerouti, 2007; Mann & Harter, 2016). Importantly, passion *positively* predicted both desirable outcomes (skill acquisition, creativity and innovation)

³ For a detailed discussion about the dependence versus independence of engagement with burnout, see the recent special issue “Burnout and work engagement: dual unity?” by Schaufeli & DeWitte (2017).

and undesirable outcomes (turnover intentions, absenteeism, and burnout). The latter is an indicator of passion's nature as a double-edged sword: The zero-order correlation of passion with these negative outcomes is negative, but when controlling for the positive components of passion (via the co-variables of positive emotions, job satisfaction, and engagement), the negative aspects of passion that remain incrementally predict the undesirable outcomes.

4.1.3 Who experiences a passion for work? (RQ3)

That passion levels tended to be higher in employees with higher socioeconomic status, rank in the organization, and in individuals working in the management of companies, suggests that high status is somehow linked to passion. Due to the cross-sectional nature of our data, we cannot determine whether highly passionate workers are more likely to get into higher ranking positions, or if higher ranking individuals perceive or display themselves as more passionate. That gender and age do not incrementally predict passion above and beyond the status-related predictors is in line with findings by Forest, Mageau, Sarrazin, and Morin (2011).

4.2 Theoretical and practical implications

Different passion measures were positively associated with self-reported creativity demands and resources, the employees' self-reported creativity and innovation, and the O*NET information about the level of creative thinking required in the kind of job of the employee (see Figure 4 and Figure 7). Such passion-creativity links in workplaces had previously been suggested in headlines or book covers (Amabile, 2001; Amabile & Fisher, 2009; Averill, 2002; Csikszentmihalyi, 1996), but rarely systematically empirically examined, except for studies linking entrepreneurial passion to creativity (Cardon et al., 2013; Kang et al., 2016; Ma et al., 2017; Shockley & Turner, 2016). To further validate this passion-creativity link, future studies should use performance measures of creativity alongside

self-reports (e.g., supervisor ratings, evaluations of products). Our cross-sectional data cannot determine whether passion fuels creativity, as suggested by Amabile (2001; Amabile & Fisher, 2009; Csikszentmihalyi, 1996), or if passion is merely fueled by similar factors that also enable creative work, such as positive affective experiences, support of autonomy and innovation, or challenging yet reachable goals. Longitudinal or experimental studies could examine which exact job attributes link passion to creativity. For instance, momentary passionate experiences (see Moeller et al., 2017) could be captured in different work tasks using the experience sampling method, and for each task the creativity and creativity-related demands and resources could be observed and rated.

That passion occurs with both positive and negative correlates and outcomes should not come as a surprise. Not only have the beneficial and ruinous aspects of passion been jointly discussed for centuries (e.g., Dixon, 2003) and in recent research (Vallerand et al., 2003), it is also demonstrable in lived experience that employees who care deeply about their work and persist in the face of obstacles or suffer setbacks when the work they care about does not go as planned. In line with this, highly conscientious people, who usually report higher life satisfaction than their less conscientious peers, suffer more than others if they lose their job and struggle to find a new one (Boyce, Wood, & Brown, 2010). To persevere even when the going gets tough is a crucial component of passion, and probably a key reason why managers and supervisors care about their employees' passion. The weak or insignificant relations between passion and negative work experiences (hindrance demands, see Figure 4; negative emotions, see Figure 1) are in line with the idea that passionate employees stubbornly persist despite aversive experiences. To find out which employees show persisting high passion despite aversive work experiences, and why, we suggest that future studies focus on employees' subjective reasons to persist.

While the Dual Model of Passion expects the original internalization process (controlled versus autonomous in terms of the self-determination theory; Deci & Ryan, 1985) to decide whether a harmonious or obsessive passion results, we propose that current experiences, such as daily hassles, current goal conflicts, current demands and resources, legal obligations, and current financial dependencies, may turn an existing, originally positive/harmonious passion into an aversive passion (or vice versa). A highly passionate person may have seen their life purpose in their work at the age of 25, but may feel increasingly overwhelmed at work at the age of 35 despite – or because of – a strong passion for work (e.g., when the arrival of a new family member causes previously unknown goal conflicts). A crucial question therefore is what managers and supervisors can do, at any given time, to enable highly passionate employees to maintain the positive and reduce the negative feelings and outcomes as much as possible.

That different facets of passion incrementally and independently predicted work outcomes suggests an interesting direction for future studies. Most researchers agree in defining passion as a multifaceted construct, but specific facets are rarely distinguished and measured, beyond the distinction between the harmonious and obsessive aspects. Distinctions between specific passion facets promise to be fruitful for longitudinal studies on the development of passion and the psychological processes underlying the relation of passion to its predictors and outcomes. We hypothesize commitment to explain long-term persistence, and desire to be linked to momentary experiences of reward and motivational intensity (see Moeller, 2014, Moeller, Eccles, et al., 2015). We also expect different developmental processes to underly the development of desire and commitment. Desire is conceptualized as a more fluctuating experience while commitment is understood as a rather stable inclination. Thus, we expect that measuring and distinguishing specific facets will be fruitful in future longitudinal studies on the development of passion. Distinguishing between specific facets of passion will also help to understand the exact

relationship of work passion to other multifaceted constructs, like work engagement, which overlap in some but not all facets.

Of practical relevance is the finding that highly passionate employees, similar to highly engaged employees, can be at risk of increased burnout, turnover intentions, and absenteeism, in spite of their positive work experiences. Organizations and managers may want to consider supporting their highly passionate employees with tailored resources that help them cope with high stress. Maybe some of the stress and frustration reported by highly passionate employees might exist because of, not despite, their high passion. It is a hypothesis for future studies to examine that maybe stress and frustration result when highly passionate employees are prevented from doing the best job they can due to unnecessary obstacles. Since our data show common co-occurrence of being happy and frustrated among highly passionate individuals, future studies could examine the causes of the frustration, and managers might want to explore if unnecessary stressors prevent the most passionate among their employees from living up to their potential and passion. If these possibilities are not explored, organizations risk losing their best, most motivated employees to stress-related issues that could be prevented or ameliorated if highly passionate employees were asked more often what they need to keep doing a good job while maintaining their health (Moeller et al., 2018; Seppälä & Moeller, 2018).

4.3 Limitations and future directions

One limitation of this study is that although we used different sources of information (O*NET job descriptions, participants' own open-ended responses and ratings), all measures of passion reflect participants' self-reports. Future studies could add other-rated measures of passion and behavioral outcome observations (e.g., recorded sick days) (see e.g., Davis et al., 2017; Mitteness et al., 2012). Furthermore, a person might be passionate about some aspects of their work but not others. For instance, considering two individuals with the same passion score, one

might experience a strong passion for only one work activity (e.g., writing research articles), but not others (e.g., teaching, administration), while the other might be moderately passionate about all these activities. To find out whether that makes a difference, future studies should combine activity-specific passion measures with intra-individual profile analyses. This research could build upon the domain-specific measures proposed in the research on entrepreneurial passion (e.g., Cardon et al., 2013) and use intensive longitudinal data to examine momentary passion in specific work situations (see e.g., Moeller, Dietrich, Eccles, & Schneider, 2017).

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6. APPENDIX

Table S1:

Descriptives of all measures

	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>SD</i>	<i>α</i>
Feeling passionate (single item)	0	100	60.89	31.58	-
<i>Passion scale</i>					
Intent	1	6	4.37	1.07	.74
Long-term goals	1	6	4.15	1.28	.70
Identification	1	6	3.94	1.42	.72
Desire	1	6	3.51	1.39	.88
Commitment	1	6	4.16	1.07	.80
Passion total score	1	6	3.83	1.14	.85
<i>Emotions</i>					
Positive emotions scale	0	100	63.28	23.59	.93
Negative emotions scale	0	100	36.52	21.71	.92
<i>Correlates job resources</i>					
Rewards and recognition	1	6	4.04	1.33	.79
Job security	1	6	4.27	1.10	.80
Purpose and meaning	1	6	4.54	1.18	.79
Creativity support	1	6	3.56	1.37	.89
<i>Correlates job demands</i>					
Fear of speaking up	1	6	2.95	1.38	.93
Unethical climate	1	6	1.89	1.25	.93
Creativity demand	1	6	3.93	1.39	.87
Cumbersome bureaucracy	1	6	2.82	1.18	.88
<i>Outcomes</i>					
Identification with the organization*	1	7	4.82	1.47	.90
Skill acquisition	0	4	2.55	1.21	.70
Creativity and Innovation	0	4	1.90	1.24	.92
Turnover intentions	1	6	3.29	1.54	.87
Absenteeism	1	6	1.98	1.05	.86
Burnout	1	6	3.08	1.40	.93
<i>Covariates</i>					
Engagement	1	6	4.82	0.98	.92
Overall job satisfaction	1	6	4.51	1.42	.94
<i>Predictors</i>					
Importance of persistence (O*NET)	37	97	72.59	10.52	-
Level of thinking creatively (O*NET)	17	93	53.06	15.39	-
Age	18	96	40.78	14.10	-
Rank in organization	0	10	4.96	2.65	-
Years spent in organization	1	42	8.61	8.25	-
SES	0	10	5.53	2.30	-

Note. * = The Identification with the organization scale was only administered to a random subsample of 2,844 participants and included for validation purposes.

Zero-order inter-correlations of all measures used in the incremental validity analyses

[illegible]

PASSION FOR WORK

Table S3

M (SD) of passion levels by industry.

	‘Passionate’ item	Passion Intent	Passion Goals	Passion Identity	Passion Desire	Passion Commitment
Other	.59 (.33)	.66 (.23)	.63 (.27)	.58 (.29)	.50 (.28)	.62 (.28)
Agriculture, Forestry, Fishing and Hunting	.64 (.31)	.68 (.20)	.67 (.27)	.66 (.26)	.57 (.27)	.67 (.28)
Mining, Quarrying, and Oil and Gas Extraction	.64 (.33)	.70 (.21)	.65 (.26)	.62 (.29)	.53 (.26)	.66 (.28)
Utilities	.59 (.31)	.66 (.20)	.62 (.25)	.57 (.26)	.49 (.26)	.62 (.28)
Construction	.70 (.28)	.73 (.19)	.71 (.22)	.69 (.24)	.63 (.24)	.71 (.18)
Manufacturing	.57 (.32)	.67 (.22)	.61 (.25)	.58 (.28)	.51 (.27)	.62 (.28)
Wholesale Trade	.60 (.30)	.67 (.19)	.62 (.25)	.57 (.28)	.52 (.27)	.62 (.28)
Retail Trade	.56 (.32)	.66 (.23)	.59 (.28)	.55 (.29)	.48 (.28)	.60 (.28)
Transportation and Warehousing	.54 (.33)	.65 (.22)	.60 (.25)	.57 (.27)	.49 (.27)	.60 (.28)
Information	.63 (.29)	.69 (.20)	.67 (.22)	.63 (.27)	.60 (.26)	.67 (.28)
Finance and Insurance	.58 (.31)	.66 (.21)	.63 (.24)	.55 (.27)	.48 (.27)	.61 (.28)
Real Estate and Rental Leasing	.61 (.33)	.69 (.21)	.66 (.24)	.59 (.28)	.53 (.26)	.65 (.28)
Professional, Scientific, and Technical Services	.60 (.30)	.70 (.19)	.65 (.24)	.61 (.27)	.53 (.28)	.65 (.18)
Management of Companies and Enterprises	.74 (.26)	.75 (.18)	.75 (.19)	.72 (.24)	.67 (.24)	.74 (.18)
Administrative Support and Waste Management and Remediation Services	.53 (.33)	.66 (.21)	.61 (.23)	.55 (.30)	.46 (.31)	.61 (.28)
Educational Services	.64 (.30)	.70 (.20)	.66 (.24)	.64 (.26)	.50 (.28)	.66 (.28)
Health Care and Social Assistance	.64 (.31)	.68 (.21)	.64 (.25)	.60 (.28)	.45 (.27)	.64 (.28)
Arts, Entertainment and Recreation	.67 (.29)	.67 (.2)	.68 (.24)	.64 (.27)	.54 (.28)	.67 (.28)
Accommodation and Food Services	.57 (.32)	.66 (.22)	.59 (.26)	.54 (.29)	.49 (.28)	.60 (.28)
Other Services (except Public Administration)	.57 (.33)	.64 (.22)	.60 (.26)	.55 (.29)	.46 (.28)	.60 (.28)
Public Administration	.50 (.32)	.65 (.21)	.60 (.24)	.56 (.29)	.46 (.27)	.60 (.28)
Total Average	.60 (.32)	.68 (.21)	.63 (.25)	.59 (.28)	.50 (.28)	.63 (.28)
$p\eta^2$	.021	.012	.018	.021	.028	.023
d for difference between the most and least passionate industry sector	.82	.55	.67	.68	.86	.69

Note: For a comparison across measures, all passion measures were transformed to range from 0 (minimum value) to 1 (maximum value), using the Proportion of Maximum Scaling (POMS) method (see Little, 2013). The M. significant with $p < .000$ for all passion measures but all omnibus effect sizes (η^2) for overall difference between industries were small, as indicated above.

Table S5:

Comparison of industry groups in the U.S. workforce, the full sample, and the cleaned sample

		U.S. workforce ¹	Full Sample	Cleaned Sample
11	Agriculture, Forestry, Fishing and Hunting	1	1.01	0.9
21	Mining, Quarrying, and Oil and Gas Extraction	1	0.41	0.3
22	Utilities	1	1.11	1.0
23	Construction	4	6.22	5.4
31-33	Manufacturing	9	6.45	6.9
42	Wholesale Trade	4	1.42	1.3
44-45	Retail Trade	11	9.05	9.5
48-49	Transportation and Warehousing	4	3.04	3.1
51	Information	2	3.45	2.9
52	Finance and Insurance	4	5.41	5.4
53	Real Estate and Rental Leasing	2	1.32	1.3
54	Professional, Scientific, and Technical Services	6	6.45	6.6
55	Management of Companies and Enterprises	2	1.14	1.0
56	Administrative Support and Waste Management and Remediation Services	6	1.00	1.0
61	Educational Services	9	9.88	11.1
62	Health Care and Social Assistance	15	10.85	11.8
71	Arts, Entertainment, and Recreation	2	3.29	3.1
72	Accommodation and Food Services	9	3.73	4.2
81	Other Services (except Public Administration)	3	5.98	6.1
92	Public Administration	5	2.05	2.3
	Other	not specified	16.73	14.9

Note. ¹ = Quota according to the Bureau of Labour Statistics 2013

Table S6:

Comparison of demographic groups in the U.S. workforce, the full sample, and the cleaned sample

	U.S. workforce ¹	Full Sample	Cleaned Sample
<i>Gender (as of March 2016)</i>			
Female	46.80	46.70	49.22
Male	53.20	53.10	50.59
other	not specified	0.20	0.18
<i>Race/ethnicity</i>			
White	78.70	80.30	82.68
Black/African American	10.10	11.20	9.40
American Indian or Alaska Native	0.70	1.50	1.57
Asian	3.80	4.50	4.23
Native Hawaiian or Other Pacific Islander	0.10	0.30	0.30
Some other race	4.60	2.60	2.40
Two or more races	2.00	2.20	2.20
Hispanic/Latino	10.30	10.70	9.78
Non-Hispanic/Latino	89.70	89.30	90.22
<i>Age</i>			
16-24 years	13.70	13.65	12.18
25-54 years	64.60	64.40	65.05
55 years and older	16.40	16.31	17.73
65+ years	5.40	4.58	5.04
<i>Region (as of March 2016)</i>			
Northeast	18	17.62	19.91
South	36.50	36.67	36.18
Midwest	22	24.71	26.04
West	23.50	21.01	20.58

Note. 1 = Quota according to the Bureau of Labour Statistics 2014-2016.

See Excel spreadsheets:

Table S7: All edges of the network of co-endorsements between passion measures and positive emotions in highly passionate employees (fourth quartile passion total score)

Table S8: All edges of the network of co-endorsements between passion measures and negative emotions in highly passionate employees (fourth quartile passion total score)

Table S9: All edges of the mixed-emotion network of co-endorsements between positive and negative emotions in highly passionate employees (fourth quartile passion total score)