

EMPLOYEE STRESS, ENGAGEMENT, AND WORK OUTCOMES

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ABSTRACT

We set out to explore how the Yerkes-Dodson law (Yerkes & Dodson, 1908) applies to stress, employee engagement, and four employee outcomes: motivation, organizational citizenship behavior (OCB), employee's use of work time (EUT), and self-reported absenteeism (SRA). We found that employee stress and engagement both showed a linear relationship with the employee outcomes we studied (i.e., the outcomes were consistently better for employees with higher levels of engagement and for employees with lower levels of stress). The relationship between stress and engagement was linear for high and low engagement levels but nonlinear for medium engagement. When examining the interactive effects of stress and engagement, we found that engagement had a stronger impact on motivation, EUT, and OCBs than on SRA. While stress also had some impact on motivation and EUT, it had little impact on OCB, and it had a larger impact on SRA, indicating that employee absenteeism is higher in higher stress settings. Our findings imply a well-being strategy for organizations. Instead of only focusing on such activities as meditation, breathing, and exercise for stress reduction, organizations should focus more on increasing employee engagement by providing employees with access to the right organizational and job resources. Such resources can help alleviate job stress while increasing job engagement, ultimately leading to better employee outcomes.

INTRODUCTION

According to the American Psychological Association (2015), overall stress levels increased from 2014 to 2015, and 24% of adults reported experiencing extreme stress. At the same time, Gallup reported that less than one third of US employees are engaged in their jobs (Adkins, 2015), and Society for Human Resource Management found an average level of employee engagement to be only moderate (2016). At a first glance, this combination of increased stress and moderate levels of engagement appears to be bad news for organizations.

STRESS AND PERFORMANCE

Stress, specifically occupational stress, has been linked to numerous negative consequences for employees and employers (O'Brien, 2008). For example, Simon & Amarakoon (2015) linked occupational stress to anxiety, fatigue, and disengagement, and The American Institute of Stress (n.d.) mentioned increased absenteeism as one of many consequences of stress. Motowidlo, Packard, and Manning (1986) reported that stress leads to a decrease in cognitive/motivational elements of employee performance, such as concentration, perseverance, and adaptability. Lang and colleagues (Lang, Thomas, Bliese, & Adler, 2007) also tested a linear, albeit mediated/moderated, relationship between job demands and job performance, finding that physical and psychological strain mediated the demands-performance relationship, while role clarity served as a moderator.

Not all stress, however, is bad. Research continues to show that increased stress can be good (up to a point). According to the Yerkes-Dodson law (Yerkes & Dodson, 1908), there is an optimal mid-range or sweet spot of emotional or physical stress associated with higher performance (see Figure 1). Too little stress can lead to decreased activation, performance, and participation in life. Conversely, too much stress can lead to over activation, the inability to perform, or negative emotional and physical outcomes. While some researchers question the shape of the actual relationship between stress and performance (e.g., Hancock, 2009), the idea remains that that, up to a certain point, as stress increases performance also increases.

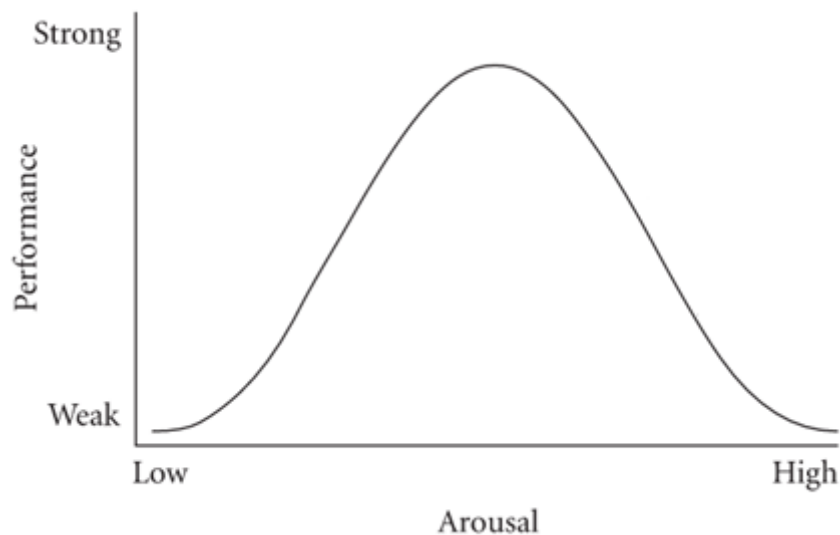


Figure 1. Yerkes-Dodson law of arousal suggests that performance peaks at optimal levels of arousal.

Hypothesis 1: Employee stress will have an inverted “U” shape relationship with employee outcomes.

EMPLOYEE ENGAGEMENT AND PERFORMANCE

Employee engagement has been widely studied and has also been linked to numerous outcomes not just for employees but also for organizations (Saks & Gruman, 2014). To start with, Salanova, Agut, & Peiró (2005) showed a link from employee engagement to service climate, employee performance, and customer loyalty. Bakker and Demerouti (2008) reported that employee engagement was positively related to employee creativity, productivity, and also to customer loyalty. Caesens, Stinglhamber, and Marmier (2016) linked higher engagement to lower turnover intentions. Although Caesens and colleagues (2016) have reported a curvilinear relationship between employee engagement and turnover intentions, most researchers showed linear relationship between employee engagement and employee and business level outcomes. And while Halbesleben, Harvey, and Bolino (2009) found that work engagement can interfere with family, most research focused on the positive outcomes of engagement.

Hypothesis 2: Employee engagement will have a linear relationship with employee outcomes, with higher engagement related to better outcomes.

STRESS AND EMPLOYEE ENGAGEMENT

A number of researchers have proposed that the Yerkes-Dodson law (Yerkes & Dodson, 1908) also applies to the relationship between occupational stress and employee engagement; that is, stress is related to higher engagement but up to a point. After a certain point, the relationship reverses, and more stress does not result in higher engagement. For example, Simon & Amarakoon (2015) suggested that maintaining an optimal level of occupational stress can result in a higher level of employee engagement. However, the findings are mixed, with some studies (Bakker, Albrecht, & Leiter, 2011) failing to find a relationship between engagement and physiological markers of stress. Despite the mixed findings, we proposed that perceived stress and engagement will be related in a nonlinear fashion.

Hypothesis 3: Stress and employee engagement will have an inverted “U” relationship.

STRESS, EMPLOYEE ENGAGEMENT, AND PERFORMANCE

Although numerous studies have explored how both stress (as often measured through job demands) and engagement are related to employee outcomes, the analyses often followed a linear model. For example, Bakker, Demerouti, and Verbeke (2004) found that job demands were an important antecedent of performance, both directly and through their relationship to burnout; the researchers also showed that the impacts of job demands on disengagement were mediated by job resources. However, given the presence of the curvilinear relationships between stress and performance and between stress and employee engagement, we decided to take a nonlinear approach and hypothesized that there will be a curvilinear, rather than a linear, relationship between the interaction of stress and employee engagement and employee outcomes.

Hypothesis 4: The interaction of stress and engagement will have a nonlinear relationship to performance.

METHOD

To better understand whether there is a sweet spot in how stress and engagement are related to motivation, we conducted a research project across all of our participants.


PARTICIPANTS

The data included responses to the Limeade well-being assessment collected between January and October of 2016. The assessment is administered to employees by their organizations as part of a well-being improvement program. Employees may complete the assessment to qualify for gift cards, health premium reductions or other financial and social benefits. Assessment completion typically takes place in the first three to four months of a well-being program, and such programs typically run for one year, starting in January and ending in December.

Our sample included responses from 476,504 employees and consisted of 61% females; average age was 41 years old (standard deviation of 14.97). Due to missing data relating to how organizations design their well-being programs, our final analyses of stress, engagement, and motivation included 173,831 participants. Organizations represented in these analyses ranged in size from small (i.e., 1 to 499 employees) to large (i.e., over 20,000 employees), belonged to different industries such as healthcare, retail, and technology, and were from different parts of the United States.

MEASURES

The Limeade well-being assessment was used for data collection. Developed in 2006, the well-being assessment is intended to help individuals and employers measure and improve the facets that contribute to human well-being. Rooted in positive psychology, medicine, sociology, behavioral psychology and organizational psychology, the assessment uniquely combines



personal well-being, work and health (including health risk) factors. As such, it presents a comprehensive model of overall well-being, highlighting the interdependencies and the intricacies of relationships among such diverse outcomes as organizational commitment, employee engagement, resilience, quality of relationships, stress and physical health.

The well-being assessment consists of over 200 questions asking the participants to rate their answer on an ordinal scale of 1 to 5, where 1 equals strongly agree and 5 equals strongly disagree. Individual questions are grouped into 34 dimensions, which are scored by first reverse-scoring individual questions and then averaging the responses to each item in the given dimension. Dimension scores can range from 1 to 5, with higher scores indicating higher well-being in each dimension.

STRESS. We measured employee stress using our “Managing Stress & Anxiety” dimension. Sample questions included “I have been under a lot of stress in the last month” and “In the last month, I have felt really anxious and worried.” Stress scores range from 1 to 5. In addition, in preparing our data for analyses, we created 3 stress groups: high stress (with dimension scores of less than 3), medium stress (scores of 3 to less than 4), and low stress (scores of 4 or higher).

EMPLOYEE ENGAGEMENT. Employee engagement was measured with our “Feeling Energized” dimension that included such questions as “I feel personally engaged in my work” and “Most days, I feel energized by my work.” Engagement scores range from 1 to 5. In addition, in preparing our data for analyses, we created 3 engagement groups: low engagement (with dimension scores of less than 3), medium engagement (scores of 3 to less than 4), and high engagement (scores of 4 or higher).

EMPLOYEE OUTCOMES. We measured four employee outcomes: overall motivation (referred to as motivation), employee use of time (EUT), organizational citizenship behavior (OCB), and self-reported absenteeism (SRA). We measured motivation with a single question: “I am motivated to do my job.” Response options ranged from 1 (strongly agree) to 5 (strongly disagree). We grouped responses into three groups: high motivation (strongly agree and agree), medium motivation (neither agree nor disagree), and low motivation (disagree and strongly disagree). We measured EUT with a single question: “My time at work is spent wisely.”

Response options ranged from 1 (strongly agree) to 5 (strongly disagree). We grouped responses into three groups: high EUT (strongly agree and agree), medium EUT (neither agree nor disagree), and low EUT (disagree and strongly disagree). We measured OCB with a single question: “I go out of my way to do extra things at work that aren't necessarily required.”

Response options ranged from 1 (strongly agree) to 5 (strongly disagree). We grouped responses into three groups: high OCB (strongly agree and agree), medium OCB (neither agree nor disagree), and low OCB (disagree and strongly disagree). We measured employee SRA with a single question: “I am absent from work more often than my co-workers are.” Response options ranged from 1 (strongly agree) to 5 (strongly disagree). We grouped responses into three groups: high SRA (strongly agree and agree), medium SRA (neither agree nor disagree), and low SRA (disagree and strongly disagree).

See Table 1 for distribution of groups for each of our variables.

Table 1		
<i>Distribution of Groups for Each Variable</i>		
Variable group	Distribution	Group size
Stress		
High	14%	46,364
Medium	39%	133,785
Low	47%	160,934
Engagement		
High	60%	132,159
Medium	32%	71,335
Low	8%	17,231
Motivation		
High	86%	241,954
Medium	12%	32,780
Low	3%	8,402
EUT		
High	88%	251,348
Medium	11%	30,088
Low	2%	5,976
OCB		
High	59%	156,708
Medium	28%	74,011
Low	13%	34,829
SRA		
High	5%	25,832
Medium	4%	17,243
Low	51%	244,591

RESULTS

Since our project was exploratory in nature, and we worked with categorical, highly skewed data, we used Pearson’s Chi-Square and three-way loglinear analyses to examine whether there was an association between employee engagement, stress, and employee outcomes.

First, we tested the relationship between stress and outcomes (Hypothesis 1). Using Pearson’s Chi-Square (see Table 2), we found that employees with lower stress had better outcomes than employees with higher stress (see Figures 2 through 5). The relationship between stress and outcomes was linear for motivation, EUT, and SRA, which did not support our hypothesis that there will be an inverted “U” shape relationship between stress and outcomes. However, the relationship between stress and OCB followed somewhat of a nonlinear relationship when examined separately for low, medium, and high level of stress (see Figure 4).

Table 2			
<i>Stress and Employee Outcomes Pearson’s Chi-Square Analyses</i>			
Predictor	Outcomes	Pearson’s Chi-Square results	<i>p</i>
Stress	Motivation	$\chi^2[4] = 8,390.41$	< .01
	EUT	$\chi^2[4] = 9,508.84$	< .01
	OCB	$\chi^2[4] = 609.13$	< .01
	SRA	$\chi^2[4] = 3,306.80$	< .01

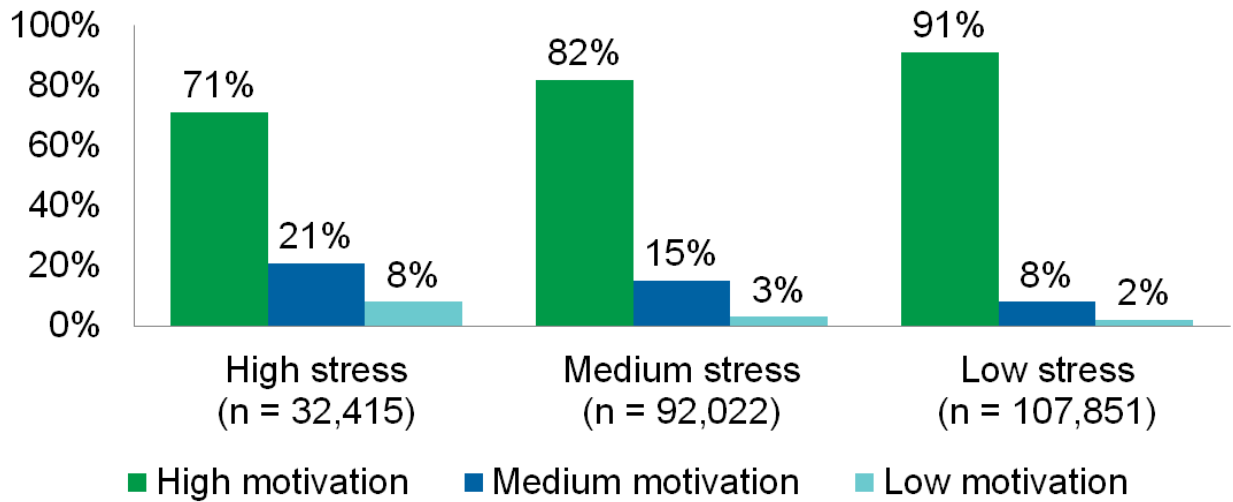


Figure 2. Motivation by stress (n = 232,288).

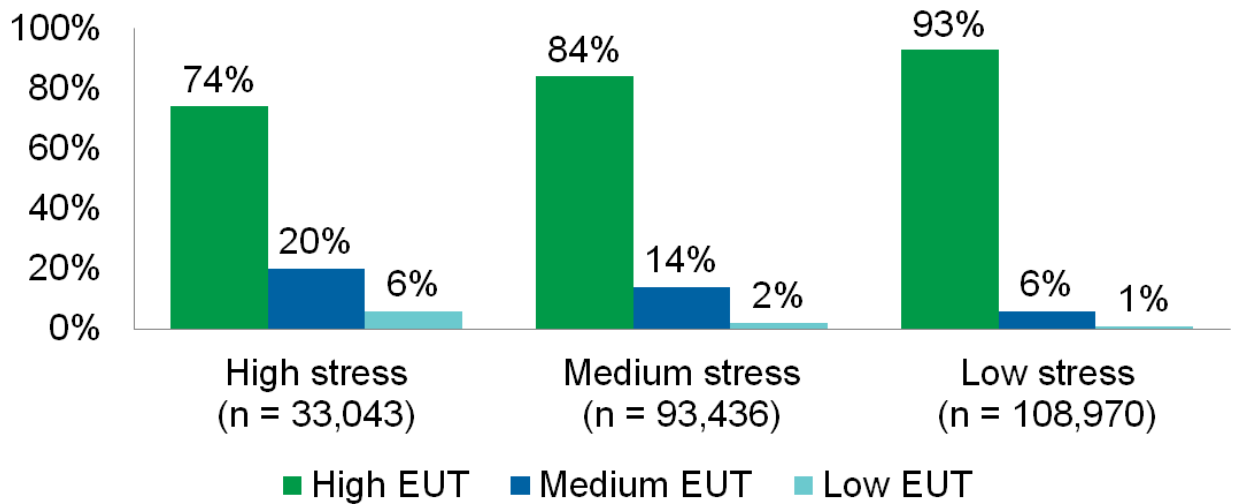


Figure 3. EUT by stress (n = 235,449).

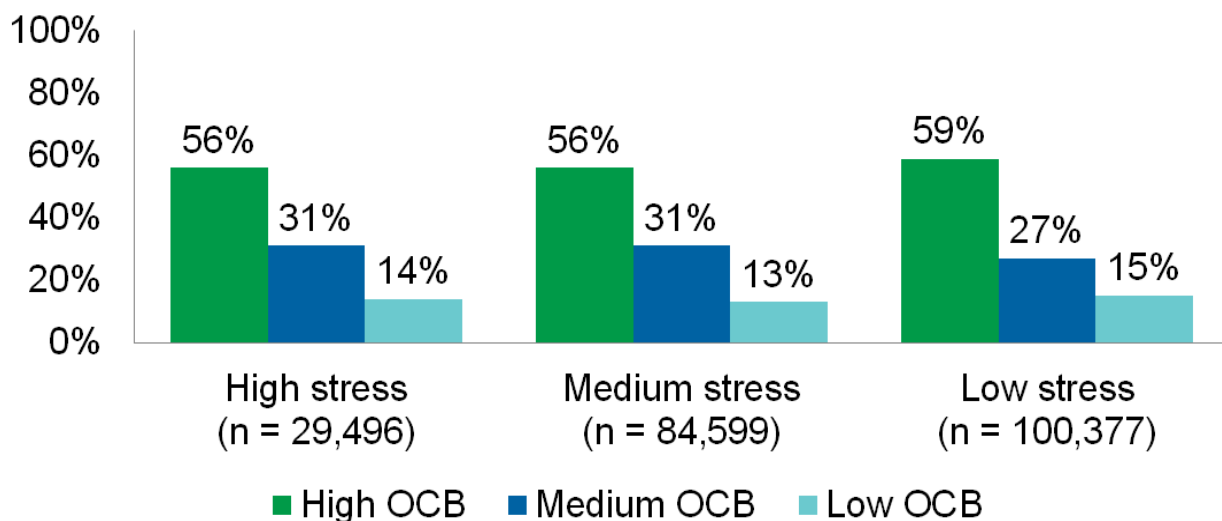


Figure 4. OCB by stress (n = 214,472).

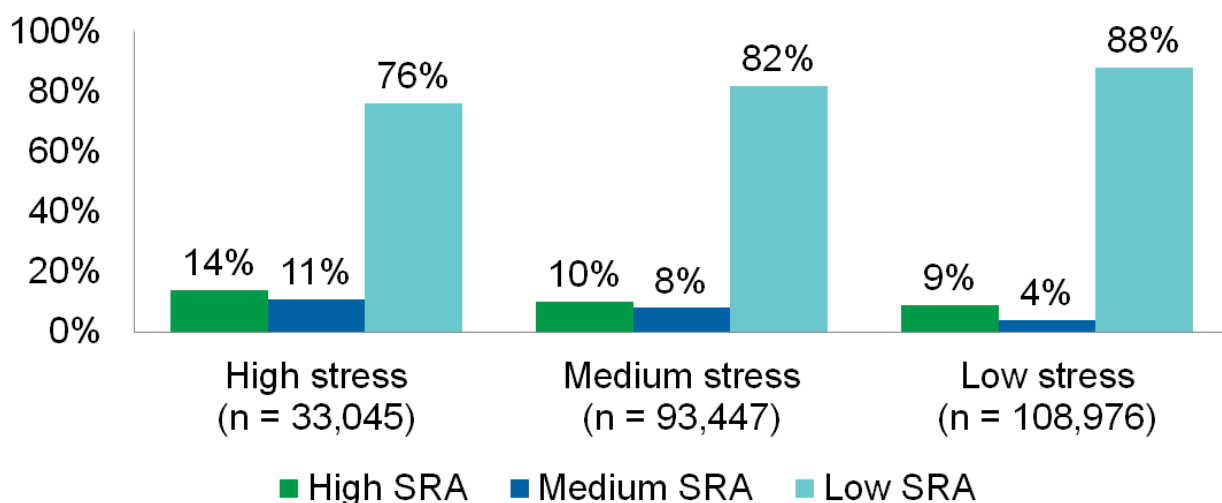


Figure 5. SRA by stress (n = 235,468).

Next, we tested the relationship between employee engagement and outcomes (Hypothesis 2). Using Pearson's Chi-Square (see Table 3), we confirmed our hypothesis that there was a linear relationship between engagement and outcomes. Employees with higher engagement had better outcomes than employees with lower engagement (see Figures 6 through 9).

Table 3

Engagement and Employee Outcomes Pearson's Chi-Square Analyses

Predictor	Outcomes	Pearson's Chi-Square results	<i>p</i>
Engagement	Motivation	$\chi^2[4] = 45,001.25$	< .01
	EUT	$\chi^2[4] = 26,871.96$	< .01
	OCB	$\chi^2[4] = 3,339.39$	< .01
	SRA	$\chi^2[4] = 3,700.08$	< .01

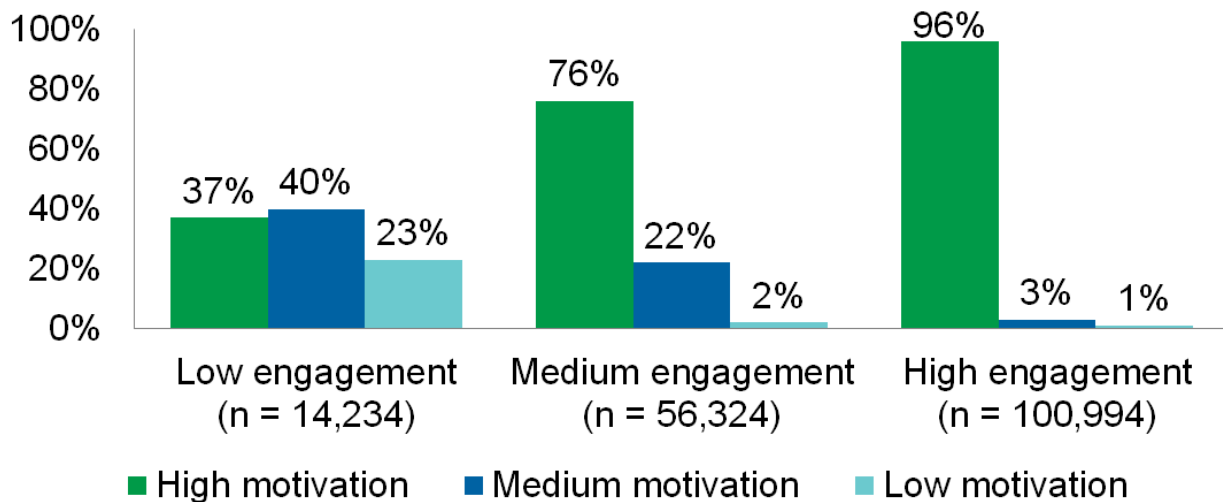


Figure 6. Motivation by engagement (*n* = 171,552).

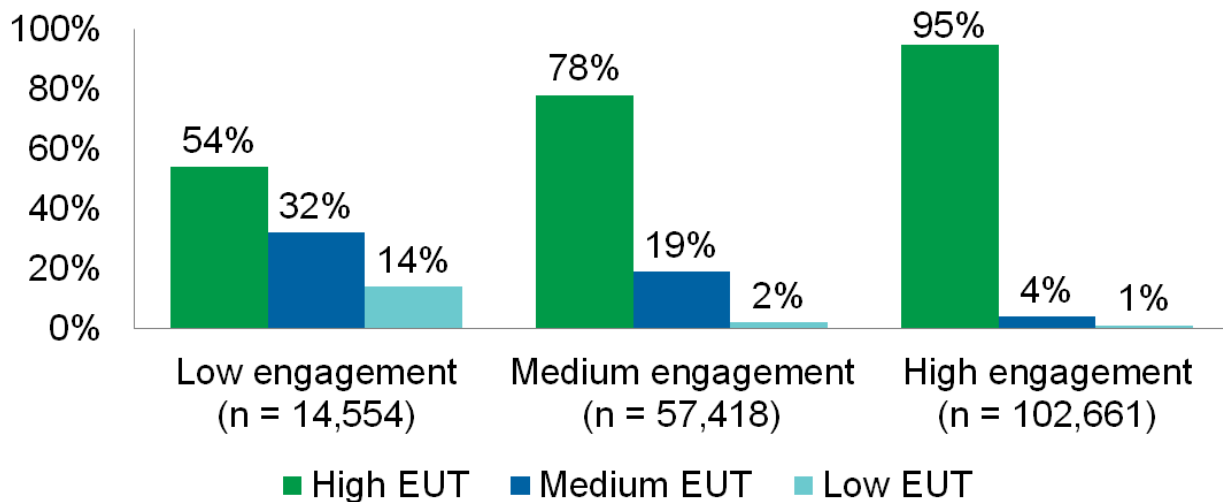


Figure 7. EUT by engagement (*n* = 174,633).

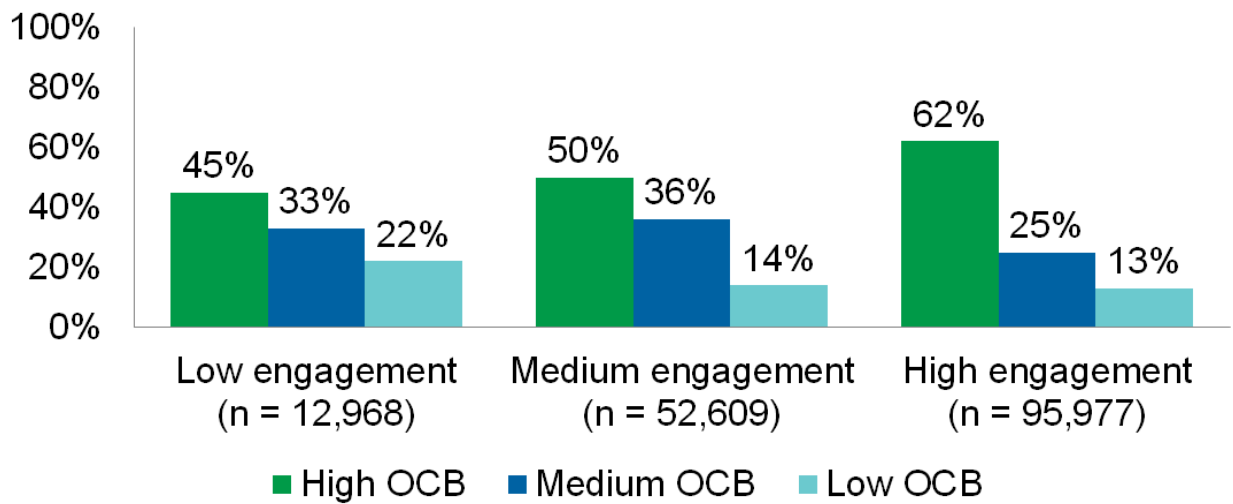


Figure 8. OCB by engagement (n = 161,554).

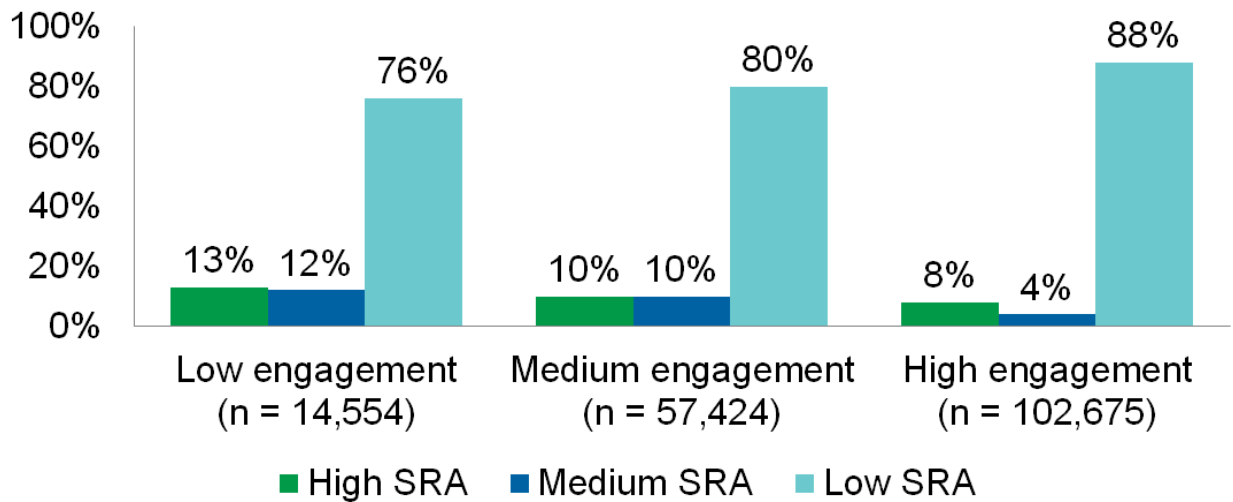


Figure 9. SRA by engagement (n = 174,653).

The next part of our analyses involved testing the relationship between stress and employee engagement (Hypothesis 3). We found a negative correlation between stress and employee engagement (Spearman’s rho = -.43, $p < .01$). Since we were looking for nonlinear relationship between the two variables, we followed up with Pearson’s Chi-Square analyses. We found that employees in lower stress groups were more likely to be engaged than employees in the higher stress groups ($\chi^2[4] = 25,736.43, p < .01$). However, there was a different pattern of results for employees reporting medium and low engagement—they were more likely to report medium levels of stress, while those with high engagement were more likely to report low levels of stress (see Figure 10). These findings partially supported our hypothesis that stress and engagement have an inverted “U” relationship.

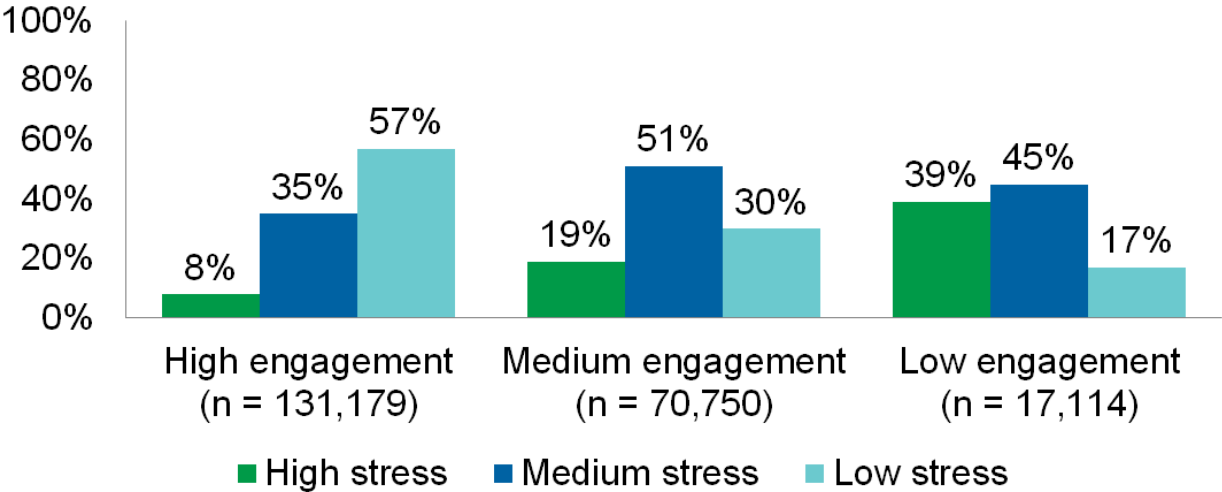


Figure 10. Engagement by stress (n = 219,043).

Finally, we examined how the combination of stress and engagement was related to employee outcomes. We used the three-way loglinear analysis; for all outcomes, the highest order interaction (engagement X stress X outcome) was significant (see Table 4). To further explore this effect, we carried out Pearson’s Chi-Square analyses on the engagement and each of the outcome variables separately for each stress group; all tests were significant (see Table 5).

Table 4

Results of Three-way Loglinear Analyses

Highest order interaction tested	Likelihood ratio	Highest order interaction
Engagement X Stress X Motivation	$\chi^2[0] = 0, p = 1$	$\chi^2[8] = 82.32, p < .01$
Engagement X Stress X EUT	$\chi^2[0] = 0, p = 1$	$\chi^2[8] = 231.88, p < .01$
Engagement X Stress X OCB	$\chi^2[0] = 0, p = 1$	$\chi^2[8] = 25.73, p < .01$
Engagement X Stress X SRA	$\chi^2[0] = 0, p = 1$	$\chi^2[8] = 124.36, p < .01$

Table 5

Follow-up Pearson's Chi-Square Tests

Engagement X outcome	Stress group	Pearson's Chi-Square	<i>p</i>
Motivation	High stress	$\chi^2[4] = 6,912.06$	< .01
	Medium stress	$\chi^2[4] = 16,405.49$	< .01
	Low stress	$\chi^2[4] = 13,583.27$	< .01
EUT	High stress	$\chi^2[4] = 3,516.78$	< .01
	Medium stress	$\chi^2[4] = 8,926.26$	< .01
	Low stress	$\chi^2[4] = 8,070.79$	< .01
OCB	High stress	$\chi^2[4] = 537.90$	< .01
	Medium stress	$\chi^2[4] = 1,431.61$	< .01
	Low stress	$\chi^2[4] = 1,204.18$	< .01
SRA	High stress	$\chi^2[4] = 227.92$	< .01
	Medium stress	$\chi^2[4] = 1,019.62$	< .01
	Low stress	$\chi^2[4] = 1,209.32$	< .01

Overall, we found that all four outcomes were better among low stress and high engagement groups than among high stress and low engagement group (see Table 6). With the exception of SRA, the effects of engagement on the outcomes were much more noticeable than the effects of stress on the outcomes; however, engagement and stress had interactive effects on all four outcomes. Specifically, motivation and EUT were higher in the low stress and high engagement group than in the high stress low engagement group. OCBs differed among the three engagement groups, but there were only small differences among the different stress groups, with OCBs increasing as stress increased. Finally, for SRA, the effect of stress was more noticeable than the effect of engagement.

Table 6				
<i>Outcomes by Engagement and Stress Groups</i>				
Engagement by stress group	Percentage of employees in the high outcome group			
	Motivation	EUT	OCB	SRA
High engagement				
High stress	93%	90%	63%	13%
Medium stress	96%	94%	62%	9%
Low stress	97%	97%	62%	7%
Medium engagement				
High stress	72%	73%	53%	12%
Medium stress	75%	77%	50%	9%
Low stress	80%	84%	49%	9%
Low engagement				
High stress	35%	49%	46%	15%
Medium stress	38%	55%	45%	12%
Low stress	43%	61%	44%	10%


CONCLUSION

We set out to examine whether there is a sweet spot (or a curvilinear relationship) in how stress and engagement are related to four employee outcomes (motivation, employee use of work time, organizational citizenship behavior, and self-reported absenteeism).

First, we found that higher stress was related to less positive employee outcomes. That is, we found that stress and employee outcomes had a linear rather than a curvilinear relationship. Although contradictory to our hypotheses, our findings provide additional support to previous research indicating a linear relationship between stress and job performance (e.g., Motowidlo, Packard, & Manning, 1986; Simon & Amarakoon, 2015; The American Institute of Stress, n.d.). Interestingly, though, this relationship was not as noticeable for OCB. While the Person's Chi-Square results were significant, the group differences were very small. This finding provides some support to O'Brien (2008) research, which showed no correlation between job stressors and OCB.

We also found that higher engagement was related to more positive employee outcomes. As we hypothesized, the relationship between engagement and outcomes was linear. Our findings provide support to previous research showing a linear relationship between engagement and employee outcomes (Bakker & Demerouti, 2008).


Next, we examined the relationship between stress and engagement and found that engaged employees tended to report lower levels of stress compared to those employees with medium and low work engagement. One possible explanation is that employees who are highly engaged are immersed in their work and have high levels of energy and enthusiasm about their work (Bakker & Demerouti, 2008); thus, they may not necessarily view their jobs as stressful. Alternatively, the organizations that have more highly engaged employees may be less stressful or may be actively helping their employees manage job stress. Previous studies have shown that job resources (such as organizational and job aspects that help to reduce job demands and stimulate growth, learning, and development) are positively associated with work engagement (Bakker & Demerouti) and mediate the relationship between job demands and engagement



(Bakker, Demerouti, & Verbeke, 2004). Still, there is more work to be done to better understand the causal relationship between stress and engagement, but there seems to be something compelling happening with highly engaged employees and their relationship with stress. More research is needed.

Finally, when we analyzed the combination of stress and engagement, we found that the interaction of engagement and stress mattered. In general, we found that although both stress and engagement were important, the impacts of stress became less noticeable when engagement was included in the interaction. Specifically, engagement had a stronger impact on motivation, EUT, and OCBs than on SRA. While stress also had some impact on motivation and EUT, it had little impact on OCB, and it had a larger impact on SRA. These findings highlight the importance of fostering employee engagement over addressing stress. Previous research (e.g., Bakker, Demerouti, & Verbeke, 2004) showed that providing the right job resources helps to not only mitigate the negative impacts of job strain on engagement and performance but also to foster employee engagement. Given our findings, we would encourage organizations to focus on providing such resources.

There are numerous ways in which organizations can provide the right resources. For example, organizations should try to ensure appropriate workload, improve the physical environment, provide employees with a chance for positive interactions with peers or customers, structure jobs in a way that uses a variety of skills and offers employees control over their jobs or autonomy in how they do their jobs (Bakker & Demerouti, 2008; Hakanen, Bakker, & Demerouti, 2005). In addition, based on our previous research (Limeade & Quantum Workplace, 2016), we recommend that organizations focus on providing organizational support to employees through ensuring that leaders, including immediate managers, are supportive and that employees have access to well-being tools and resources. Managers can support their employees through regular conversations to ensure that (1) they understand what matters to each employee, (2) employees understand how their work fits into the overall goals of the organization, and (3) employees feel that they are valued, and their efforts are being recognized and properly rewarded. Leaders can be supportive by communicating organizational direction and values, and by setting examples, showing how they live up to these values.



There are several limitations to this research. First, all variables were self-reported. In some cases, self-reported data may not be an accurate reflection of the observable behaviors a participant might exhibit. For example, a participant may say he/she is highly motivated, but that may not be how he/she behaves. Second, because this is Limeade “book-of-business” data, there may be differences in those organizations that have purchased access to a well-being program compared to organizations that do not participate in a well-being program. Third, the data was highly skewed toward the positive end of responses. Such skewed distribution could potentially indicate response bias or inaccurate self-reports for a number of reasons. The voluntary nature of participation could encourage more engaged employees to take part in the program. On the other hand, the highly incentivized nature of assessment completion (i.e., organizations often make employee insurance premium reduction contingent upon participation and assessment completion) could encourage employees to complete the assessment quickly, focusing on speed of completion rather than on the accuracy of their responses. In addition, some employees remain skeptical of the confidential nature of such assessments and may purposefully provide falsely positive information. Finally, our methodology focused on examining stress, engagement, and employee outcome interactions using a snapshot in time rather than longitudinal data. The relationships among our variables may exhibit different characteristics when examined over time.

Despite the limitations, this research sheds light on the relationship between stress and engagement and how these two variables are related to employee outcomes. Based on our initial findings, we recommend that organizations help employees manage stress levels by particularly focusing on factors that contribute to employee engagement. Instead of only encouraging such activities as meditation, breathing, and exercise for stress reduction, we recommend that organizations focus on ensuring that employees have access to the right organizational and job resources. Access to the right resources can help alleviate stress while increasing job engagement, ultimately leading to better employee outcomes.

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