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# DOES STRESS LEAD TO CREATIVITY?: THE RELATIONSHIP BETWEEN OCCUPATIONAL STRESS AND INDIVIDUAL INNOVATIVE BEHAVIOR

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***Abstract:***

*Individual innovative behavior can have important implications for organizations. This article studies the relationship between occupational stress and individual innovative behavior. Data from 139 subjects from the US was analyzed using structural equation modeling as the technique. Results from partial least squares show that there is a positive and significant relationship between both constructs. Moreover, both variables present a U form relationship. Based on this research, it could be concluded that occupational stress could influence positively innovative behavior at work. Practical implications suggest that innovative behavior could be boost by identifying conditions at work that could produce time pressure. Elements such as work overload, feedback and allowing employees to take risks could help in idea generation.*

***Key words:*** *Occupational Stress, Individual Innovative Behavior, Creativity*

## 1. Introduction

Today, the globally competitive environment has forced companies to encourage idea generation and innovative behavior at work. This phenomenon has gained popularity due to its implications for and impact on employees and organizations (Runco, 2004; Shalley et al., 2004). Innovative behavior is essential to generate ideas for the new product development process, motivate employees, solve strategic problems, etc. Research into innovative behavior in organizations sheds light on the factors that improve innovative behaviors in organizational settings.

Nonetheless, there is room for research about the potential antecessors of employees' innovative behavior. More specifically, there is a need for more research about stress and idea generation at work. Because innovative behavior involves individuals' capability to manage the emotions related to motivation and cognition (Linnenbrink & Pintrich, 2002), stress can interfere with the functioning of cognition, thereby narrowing one's intentional focus (Eysenck, 1995) on work performance. Accordingly, it is well documented that stress causes harmful effects on employees' emotions and work performance.

In addition, research has been inconclusive about the relationship between stress and innovative behavior at work. For instance, stress can decrease innovative behavior because of stressors' high demand on cognitive resources that inhibit an individual's intentions to complete valuable resource tasks (Eysenck, 1995). Consequently, individuals adopt simple cognitive strategies that create an insufficient number of creative ideas (Baron et al., 1986). Other scholars, however, argue that stress may augment innovative behavior. The key arguments following this stream emphasize that individuals under stress may be motivated to seek solutions in an active problem-solving mode (Anderson et al., 2004). Stress can even stimulate individuals to cope with challenges for self-growth and self-transformation.

Accordingly, this research studies the relationship between occupational stress at work and individual innovative behavior. Moreover, this study contributes to the stress management research by continue to clarify the relationship between both constructs. This research also focuses on finding the potential antecessors of individual innovative behaviors at work. Consequently, this investigation could provide new information about the importance of stress at work and how it can be managed. The following sections elaborate on the literature review of this work, its methodology, and its results.

## 2. Literature review

Stress at work has been noted to have an important impact on employees. Janis and Leventhal (1968) mentioned that stress could be viewed as an intervening variable with antecedent causes and behavioral consequences. According to them, stress is an undesirable emotion related to elements such as fear, anxiety, anger, irritation, and depression. The conservation of resources theory (COR) has provided one approach to understanding stress in the workplace (Hobfoll, 1989). According to COR, individuals strive to obtain, retain, protect, and foster things that they value. More specifically, stress in individuals occurs when resources are threatened with loss, when they are lost, or when a person does not gain sufficient resources following a significant investment of them. Another approach belongs to interactional theories of stress and focuses on the interaction between the employee and the workplace environment. This approach is known as the person-organization fit theory (French et al., 1974; 1982). This theory has presented two versions of employee workplace environment interaction. The first suggested stress will be evident if there is a misfit between the employee's motives, goals, and values and

environmental demands. The second version suggested stress will result from a mismatch between environmental demands and a person's skills and abilities (French et al., 1982).

Research has noted that stress at work can have both positive and negative relationships with employee outcomes. In other words, stress can be enhancing or disruptive (Boswell et al., 2004). For instance, stressors such as role ambiguity and lack of clarity are negatively related to outcomes such as performance, job satisfaction, and organizational commitment (La Rocco et al., 1980; Tubre & Collins, 2000). Conversely, stress could lead to higher levels of motivation, learning, and innovative behavior (Karasek, 1989; Anderson et al., 2004). The next section will elaborate in more detail the relationship of both constructs.

*Occupational Stress and Individual Innovative Behavior*

One approach to understand occupational stress suggests that the construct is about experiencing unpleasant emotions such as tension, anger, and depression (Kyriacou & Suctliffe, 1978). Another approach states that it is a function of adverse work experiences (Hart & Cooper, 2001). Along these lines, Motowidlow et al., (1986) noted that job conditions could be antecessors of occupational stress. More specifically, stressors such as work overload and work responsibility can generate stress in individuals.

With respect to Individual innovative behavior, some research noted that the term relates to creativity and the generation of useful ideas (Mumford & Gustafson,1988; Amabile, 1983). A more recent approach states that the concept is more complex and encompasses no only generation of new ideas but also the implementation of them (Scott & Bruce, 1994). In this sense, the construct has been defined as "the intentional creation, introduction, and application of new ideas within the work role, group, or organization, in order to benefit role performance, the group, or the organization" (Janssen, 2004, p. 202).

The relationship between occupational stress and innovative behavior can be understood with the organizational creativity theory proposed by Woodman et al., (1993). According to this theory, environmental forces within an organization influence group and individual creativity. More specifically, they noted creative behavior is a function of organizational characteristics. In the case of stress, it has been noted to arise from these environmental/characteristics, demands, and personal skills and abilities (D-A fit) (French et al., 1982). This fit has also been proposed to be objective. That is, certain variables exist independently of a person's perception.

Research has been inconclusive about the type of relationship between both constructs (Baer & Oldham, 2006; Janssen, 2000). In one of four studies about the effects of extrinsic motivation on creativity, Baer (1998) found that boys', but not girls', creativity increased when they expected an evaluation. In a review of potential facilitators of innovation, Anderson et al., (2004) noted stressors such as threat and conflict can stimulate innovative behavior. Conversely, Amabile et al., (1990) found strong evidence that the expectation of evaluation undermines creativity. Baron (1986) mentioned that distraction could lead to the generation of fewer ideas, attitude change, and social behavior.

Cavanaugh et al., (2000) classified stressors into two types. The first was named *challenge stressors* and included aspects such as time urgency, high workload, and job responsibility. According to them, these types of stressors could trigger idea generation because individuals could see them as an opportunity to grow and learn. Likewise, Ren and Zhang (2015) examined the influence of challenge stressors on innovative behavior. They found a positive association between stressors such as urgency, high workload, and job responsibility on idea generation and implementation. The second type of stressors were named *hindrance stressors* and included elements such as organizational politics, red tape, role ambiguity, and concerns about job security. Research has noted that they can undermine creativity because they could be viewed as inhibitors of personal growth and achievement (Aryee et al., 2009). For instance, Probst et al., (2010) studied the effects of job insecurity on productivity, counterproductivity and creativity. They found that job insecurity had negative effects on creative activities.

Importantly, this research focuses on the effect of occupational stress on individuals' innovative behavior. It is expected that job conditions ameliorate employees' innovative behavior. That is, this configuration could present an inverted-U relationship. Hence, stress could trigger innovative behavior until it reaches a point at which it becomes detrimental to idea generation. This approach relates to activation theory, proposed by Gardner and Cummins (1988), in which certain stressors, such as creative time pressure, could increase and decrease creativity in individuals. Figure 1 presents the model.

Therefore, this study's hypotheses are as follows:

*H1: Occupational stress will be positively associated with individual innovative behavior.*

*H2: There will be an inverted-U relationship between occupational stress and individual innovative behavior.*

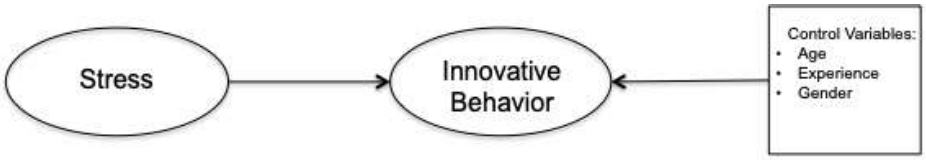


**Figure 1: Proposed model**

## 3. Methodology

*Data collection*

Using online and paper surveys, data from the south east part of Texas in the US was collected during the year 2012. The total sample consisted of 139 subjects employed in industries such as retailing, banking and finance, healthcare, and education. Descriptive statistics are shown in Table I. The data was analyzed using structural equation modeling (SEM). WarpPLS 6.0 (Kock, 2018) was the software used for the analysis. Innovative

behavior was measured with seven items from the instrument utilized by Kleysen and Street (2001). Four items from Motowidlo et al., (1986) instrument assessed occupational stress. A seven-point Likert scale was used. The range utilized was 1= strongly agree to 7 = strongly disagree. Some of the questions used for both constructs are shown in Table II:

**Table 1: Descriptive statistics**

| **Descriptive Statistics** | | | **Age** |
|---|---|---|---|
| Gender | Male | 73 (53%) | 28.20 |
| | Female | 66 (47%) | 30.90 |
| | **Total** | **139** | **-** |
| Employment status | Full | 80 (58%) | 34 |
| | Part | 56 (40%) | 22.64 |
| | Self employed | 3 (2%) | 23.33 |
| | **Total** | **139** | **-** |

**Table 2: Measurement constructs**

| **Construct** | **Item** |
|---|---|
| Innovative Behavior | In your current work, "how often do you experiment with new ideas and solutions?" |
| | In your current work, "do you experiment with new ideas and solutions?" |
| Occupational Stress | "My job is extremely stressful" |
| | "I feel a great deal of stress because of my job" |
| | "Very few stressful things happen to me at work" |
| | "I almost never feel stressed because of my work" |

*Measurement and model assessment*

The convergent and discriminant validity of the model was assessed using confirmatory factor analysis and average variance extracted (AVE) analysis. Convergent validity implies that a construct can measure what it is expected to measure (Hair et al., 1998). Results from the confirmatory factor analysis are presented in Table III. Given that two indicators from the job stress construct presented low loadings compared to the proposed threshold of 0.5 (Hair et al., 1998), they had to be removed from the analysis. Discriminant validity analysis requires looking at the AVE value and checking if the values differ (Kline, 2005). Table IV presents the results for the AVE test. Given that the values presented in parentheses are higher than the values under them, it is suggested that the model does not present problems concerning discriminant validity.

Factor analysis for Occupational stress and individual innovative behavior

**Table 3: Factor loadings for stress, and innovative behavior. Cronbach's Alpha is presented in parenthesis**

| |
|---|
| ***Occupational Stress*** **(.826)** |
| **My Job is very stressful .923** |
| **I feel a great deal of stress because of my job .923** |
| |
| ***Innovative behavior*** **(.929)** |
| **In your current work, how often you look for opportunities to improve an existing process, technology, product, service or work relationship? .825** |
| **Recognize opportunities to make a positive difference in your work, department, organization or with customers? .809** |
| **Generate ideas or solutions to address problems? .768** |
| **Experiment with new ideas and solutions? .846** |
| **Try to persuade others of the importance of a new idea or solution? .854** |
| **Push ideas forward so that they have a chance to become implemented? .883** |
| **Incorporate new ideas for improving and existing process, technology, product or service into daily routines? .876** |

**Table 4: Correlations among variables and average variance extracted (AVEs), reported in parentheses. IB= Innovative Behavior; GEN= Gender; EXP= Experience**

| | STRESS | IB | AGE | GEN | EXP |
|---|---|---|---|---|---|
| 1. STRESS | (0.923) | | | | |
| 3. IB | 0.170* | (0.838) | | | |
| 4. AGE | 0.219** | 0.127 | (1.000) | | |
| 5. GEN | -0.038 | 0.034 | -0.150 | (0.826) | |
| 6. EXP | 0.211* | 0.159 | 0.682*** | -0139 | (1.000) |

Notes: ***, **, * indicate significant level at .1%, 1% and 5% respectively

The model's reliability was checked with Cronbach's alpha. The threshold for this reliability test has been proposed at values higher than .5 (Hair *et al.*, 1998). The values presented in Table III suggest that the model has no reliability issues since all the values are higher than .5. Additionally, to avoid multicollinearity issues, a test suggested by Kock and Lynn (2012) was conducted; they suggest a threshold of 3.3 or less. As shown in Table V, the model should be multicollinearity free since all the values are lower than the threshold.

**Table 5: Full collinearity values**

| **Full VIF** | | | | |
|---|---|---|---|---|
| STRESS | IB | AGE | GEN | EXP |
| 1.079 | 1.051 | 1.902 | 1.029 | 1.905 |

### 4. Results

The results presented in Figure 2 show a positive and significant relationship between occupational stress and innovative behavior ($\beta$ = 0.270; $p$ < 0.001). This result supports Hypothesis 1 and suggests that stress is an antecessor of idea generation and

implementation at work. Besides, WarpPLS allows the interpretation of linear and nonlinear relationships among variables by presenting the best-fitting curve of the data with standardized scales. Research has noted the importance of understanding potential linear and nonlinear relationships in multivariate analysis (Pirce & Aguinis, 2013; Kock, 2010). In this case, Figure 3 presents the best-fitting curve of the relationship between both variables. The threshold or inflection point of the graph is approximately .6 standard deviations to the left of the mean. From here to approximately 1.69 standard deviations to the right, the curve confirms the positive association of stress and innovative behavior.

Hypothesis 2 suggested an inverted U form between stress and individual innovative behavior. Figure 3 generally shows a U form for both constructs. Therefore, Hypothesis 2 is not supported. Regarding the control variables, results from table IV show that none of the control variables present a significant relationship with the criterion variable. So, no significant relevance was found in the analysis.

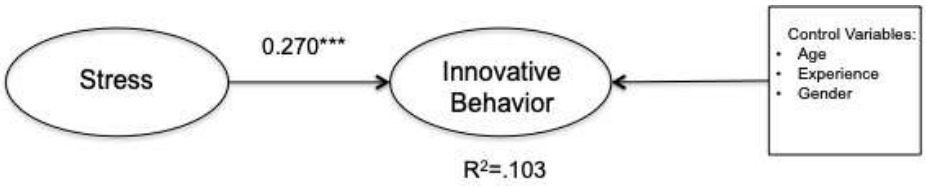


**Figure 2: Results**

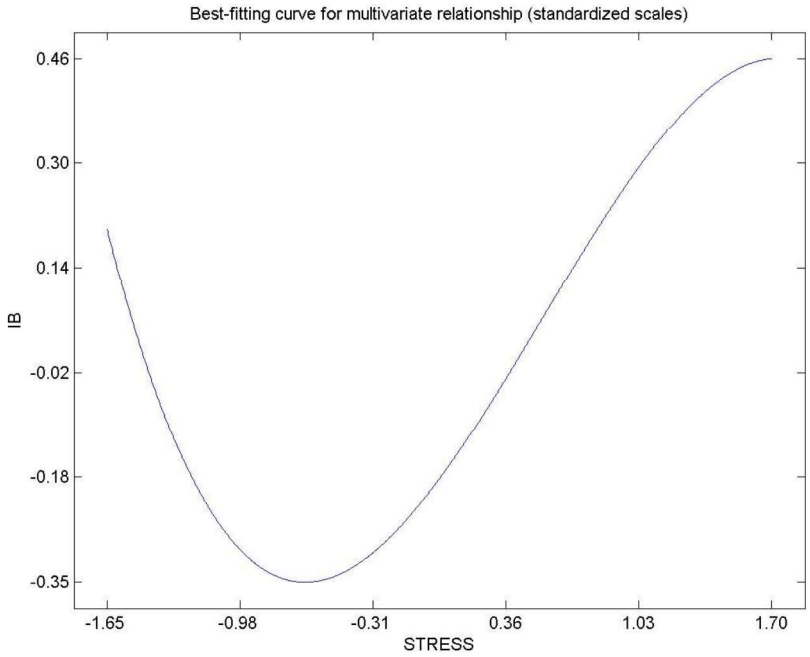


**Figure 3: Best fitting curve** (Standardized values)
IB= Innovative Behavior

## 5. Conclusions

The purpose of this research was to study the relationship between occupational stress and individual innovative behavior. Based on the results presented in Figure 2, stress is positively associated with individual innovative behavior. This result confirms that occupational stress could trigger not only job performance as in Motowidlo et al., (1986) but also individual innovation in the workplace. In this case, job conditions such as time pressure, high levels of responsibility, and job overload could play an important role in idea generation (Cavanaugh et al., 2000). This research also analyzed the nonlinear relationship between both constructs. The results are consistent with other studies that found nonlinear relationships (Baer & Oldham, 2006; Elsbach & Hargadon, 2006). Unlike what was hypothesized, the graph presents a U form. To some extent, occupational stress is detrimental to idea generation, but it reaches a point at which it boosts innovative behavior.

For practical implications, this research suggests that managers could increase innovative behavior by identifying employees and potential conditions at work that could produce time pressure and manage them accordingly to boost innovative behavior (Baer & Oldham, 2006). Also, work overload could also be a useful element to boost creativity. Kahn et al., (1964) referred to overload as too much work in too short a time. This could result in pressure on employees to find new ways to do things and could trigger positive change. Accordingly, managers who wish to encourage creativity need to provide feedback and allow employees to take new risks (Hon & Kim, 2007). With respect to shortcomings, the data was mainly collected from a specific region in the United States, and this limits the generalizability of the results. Further analysis could expand data collection to other regions in the country. Another shortcoming is the use of self-reported approaches for measuring innovative behavior and occupational stress. It has been noted that these type of approaches might lead to bias issues (Podsakoff & Organ, 1986). Finally, this research focused on the relationship between occupational stress and individual innovative behavior. Future research could include potential moderators and mediators such as the role of leaders. For instance, leaders motivational speech could moderate the relationship between both constructs.

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