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Research Paper

Impact of Innovative Work Behaviour on Intrinsic-Extrinsic Motivation and Resistance to Change of different levels of Office Engineers in Private Manufacturing Industries

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ABSTRACT

The present study investigated the relationship between innovative work behavior, motivation, and resistance to change of different levels of office engineers. Participants are 120 engineers of three levels namely; working as lower-level executives, middle-level management, and senior-level management. There are three concepts under innovative work behavior viz., idea generation, idea promotion, and idea implementation. Three groups differ in intrinsic and extrinsic motivation where intrinsic motivation is highest in middle-level engineers and extrinsic motivation is highest in lower-level engineers. Under innovative work behavior, only idea implementation differs across groups and the relationship between intrinsic motivation and innovative performance is positive and intrinsic motivation mediated the relationship between various levels of engineers and innovative work behavior.

Keywords: *Innovative Work Behavior, Motivation, Resistance, Change, Level, Employees*

Innovation has enriched humans in each and every sphere of life and therefore the pace of innovations in contemporary times is incredible. The significance of innovation for organizational effectiveness is widely acknowledged (Janssen et. al., 2004; Woodman et. al. 1993). A crucial factor for survival of the work-organizations is innovation. "Innovation is the process of creating new ideas and putting them into practice" (Dawson, 2014). In particular, employees' innovative work behavior (such as developing, adopting, and enforcing new ideas for work methods) is an important asset that enables an organization to succeed in a 'dynamic business environment' (West & Farr, 1990). Innovative Work Behavior (IWB) can be measured by using three dimensions, i.e., idea generation, idea promotion, and idea implementation (J. De Jong & D. Den Hartog, 2010). First, in the idea generation phase, the employees generate their ideas and thoughts by considering new procedures and work processes to be unique and improved. Second, idea promotion employees try and persuade co-workers about their ideas and thoughts to be adopted, followed, and implemented. Third,

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idea implementation is related to practice these novel ideas and successfully implement innovation at the workplace (J. De Jong & D. Den Hartog, 2010).

Manufacturing industries in India still remain an untapped potential (IBEF, 2012). Innovations for these kinds of production-based industries are not only essential for the inter-organizational competition but also help to play a key role in the economic growth and development of the country as a whole. Engineers in manufacturing industries are challenged to develop new and better processes, products, and technologies to be competitive and lead the process of change (Ravind Mithe, 2020). Therefore, there is a need, both theoretically and empirically, to investigate the effect of IWB on employees' work attitudes and behaviour namely, motivation (intrinsic and extrinsic) and resistance to change which will eventually indicate the potential predictor of IWB. Generally, several prior researches have focused on IWB in other sectors but manufacturing sectors were neglected, which contribute a significant portion of India's economic growth. Hence, there is a need to know and understand the nature of IWB that calls for more creativity and contributes much to the organization's innovation, effectiveness, development, and survival in the manufacturing sector where engineers contribute majority of their roles.

Creativity and innovation remain today important ingredients to the success of any organization and it has become an increasing challenge for most organizations to encourage and stimulate the generation of new and creative ideas and implement those. Employee motivation and dedication are the most significant factors in a company's ability to innovate (Eberling, 2018).

Intrinsically motivated employees are more likely to show perseverance and persistence (Vallerand & Bissonnette, 1992), and showcase higher job performance and organizational commitment (Kuvaas et. al., 2017). There is also some empirical support for a positive relationship between employees intrinsic motivation and their innovative behavior (Yuan & Woodman, 2010), and intrinsic motivation is a stronger predictor of performance quality than extrinsic motivation (Cerasoli et. al., 2014). Although a few studies have not shown a significant positive relationship between intrinsic motivation and IWB for certain professions (Bammens, 2016), it is expected that employees who are intrinsically motivated by their work exhibit high work engagement and perform tasks out of interest. These intrinsically motivated employees also utilize their effort, ability, skills, and talent for working innovatively. Thus, relative to both identified motivations, it is likely that intrinsic work motivation expresses the strongest relationship with IWB among workers.

Extrinsic motivation, in contrast to intrinsic motivation, embodies a sense of volition for acts that are in line with people's personal aims and identities (Gagné & Deci, 2005). However, a study by Bammens in 2016 revealed that extrinsic motivation is likely to be associated with IWB. Employees who find their work meaningful (for example; people who express higher extrinsic motivation in relation to their work) will be more likely to engage in IWB since meaning is an important aspect of creative behavior and innovativeness (Cohen-Meiter, Carmeli & Waldman, 2009; Elsbach & Hargadon, 2006). Moreover, IWB is consisted not only of creative activities such as idea generation but also of tasks like idea promotion, which although complex may require less creativity and interest (Bammens, 2016). In this respect, maintaining high levels of work motivation may also lead to IWB since it can help employees persist in their complicated behaviors, but not necessarily intrinsically motivating (Bammens, 2016).

In the present age of rapid change, organizations should engage in IWB in order to meet and satisfy conflicting market demands. However, successful accomplishment of organizational changes is less likely to occur unless firms properly manage employees' reactions to the change process (Piderit, 2000). With big change often comes big resistance to maintain the status quo in the face of pressure. Resistance to change has been widely documented both by researchers and practitioners to represent one of the most critical foci of organizational change failures and thereby hinder innovative work behaviour (Oreg, 2003, 2006; Van Dam et. al., 2008; Battistelli, 2013). Focusing on this issue might thus present a valuable contribution for researchers.

Despite researchers' long-held belief that resistance to change is a dysfunctional barrier to innovation and organizational change, some scholars have claimed that opposition to change is not always harmful or counterproductive. In other words, resistance can positively contribute to effective change in initiatives under certain circumstances (Knowles & Linn, 2004; Ford et. al., 2008). However, empirical investigation of these theoretical claims is still scarce, as research on change resistance has widely recognized as the inhibiting factor to innovation (Oreg, 2006). Thus, there would be intuitive reasons to posit a negative association between resistance to change and IWB. Moreover, no research has adequately assessed the relationships between resistance to change and innovative work behaviour in the manufacturing sector. Hence, a need has emerged to assess the conditions under which resistance is often functional to successful implementation and accomplishment of organizational changes thereby opening door to innovation (Ford et al., 2008). To our knowledge, only one study investigated the negative impact of resistance to change on the adoption of service innovation (Oreg, 2003), revealing that high scores on this individual trait resulted in lower levels of innovation-adoption behaviors.

It is also important to note that the current theoretical understanding of the IWB is based largely on studies conducted in western settings, with little evidence is available from an Asian perspective. Employees who understand how to positively impact the climate of innovation and work behavior supportive of innovativeness will create the most opportunities for innovation in their organizations which, in turn, may enhance the performance of organizations (Shanker et. al., 2017)

In this study, IWB of the engineers was defined as the self-reported level of different behavioral tasks, namely, idea generation, idea promotion, and idea implementation. These three job-related components are recognized as important domains for innovation in the workplace (Scott and Bruce, 1994; Amabile et. al., 1996; Basu Mukherjee, 2009). As employee innovative behavior is seen as a strategic foundation, this research hopefully will fill the void that delineates the relationship between IWB, motivation (intrinsic and extrinsic), and resistance to change. Therefore, the objective of this study is to analyze the impact of innovative work behavior on intrinsic motivation, extrinsic motivation, and resistance to change of various levels of office engineers of private manufacturing industries.

Objectives

1. To determine the impact, if any, of rank position (senior, middle or junior) of the office engineers on
    a) motivation (intrinsic and extrinsic)
    b) innovative work behaviour (idea generation, idea promotion, and idea implementation)
    c) resistance to change

2. To determine the impact, if any, of the levels (low & high) of intrinsic motivation on
   a) idea generation,
   b) idea promotion
   c) idea implementation and
   d) resistance to change

   of the office engineers irrespective of their position/rank

3. To determine the impact, if any, of the levels (low & high) of extrinsic motivation on
   a) idea generation,
   b) idea promotion
   c) idea implementation and
   d) resistance to change

   of the office engineers irrespective of their position/rank

Hypotheses

Based on the above discussion following hypotheses are generated for this study and this relationship is provided in the conceptual framework of study in Fig. 1.

H1 There is no significant effect of rank on
   a) Intrinsic Motivation
   b) Extrinsic Motivation
   c) Idea Generation
   d) Idea Promotion
   e) Idea Implementation
   f) Resistance to change

H2 No significant effect of Intrinsic Motivation of engineers on
   a) Idea Generation
   b) Idea Promotion
   c) Idea Implementation
   d) Resistance to change

H3 No significant effect of level of Extrinsic Motivation of engineers on
   a) Idea Generation
   b) Idea Promotion
   c) Idea Implementation
   d) Resistance to change

METHODOLOGY

Selection of organization

10 organizations of the different service sectors (private) were formally approached for permission of collecting data from engineers of respective organizations.

Sample

The sample consisted of one hundred and twenty engineers who volunteered to participate in the study. Their age ranges between 23yrs – 58yrs.

For the present study, a representative sample was selected based on the following criteria:

Criteria	Sample I	Sample II	Sample III
Age Limit	23 to 35 years	36 to 47 years	47 years and above
Educational Qualification	Minimum graduate or diploma in engineering	Minimum graduate or diploma in engineering	Minimum graduate or diploma in engineering
Experience in the field	Minimum 6 months	Minimum 8 years	Minimum 15 years

Description of the samples

Group	Sample Size	Designation of Employees
Lower-Level Executive	40	Design Engineer, Assistant Engineer Trainee, Executive Junior Engineer, Graduate Engineer Trainee
Middle-Level Management	40	Assistant Manager, Senior Production Engineer, Manager, Supervisor, Officer
Senior-Level Management	40	Senior Consultant, General Manager, Senior Manager, DGM & Consultant, Chief Manager

Study Design

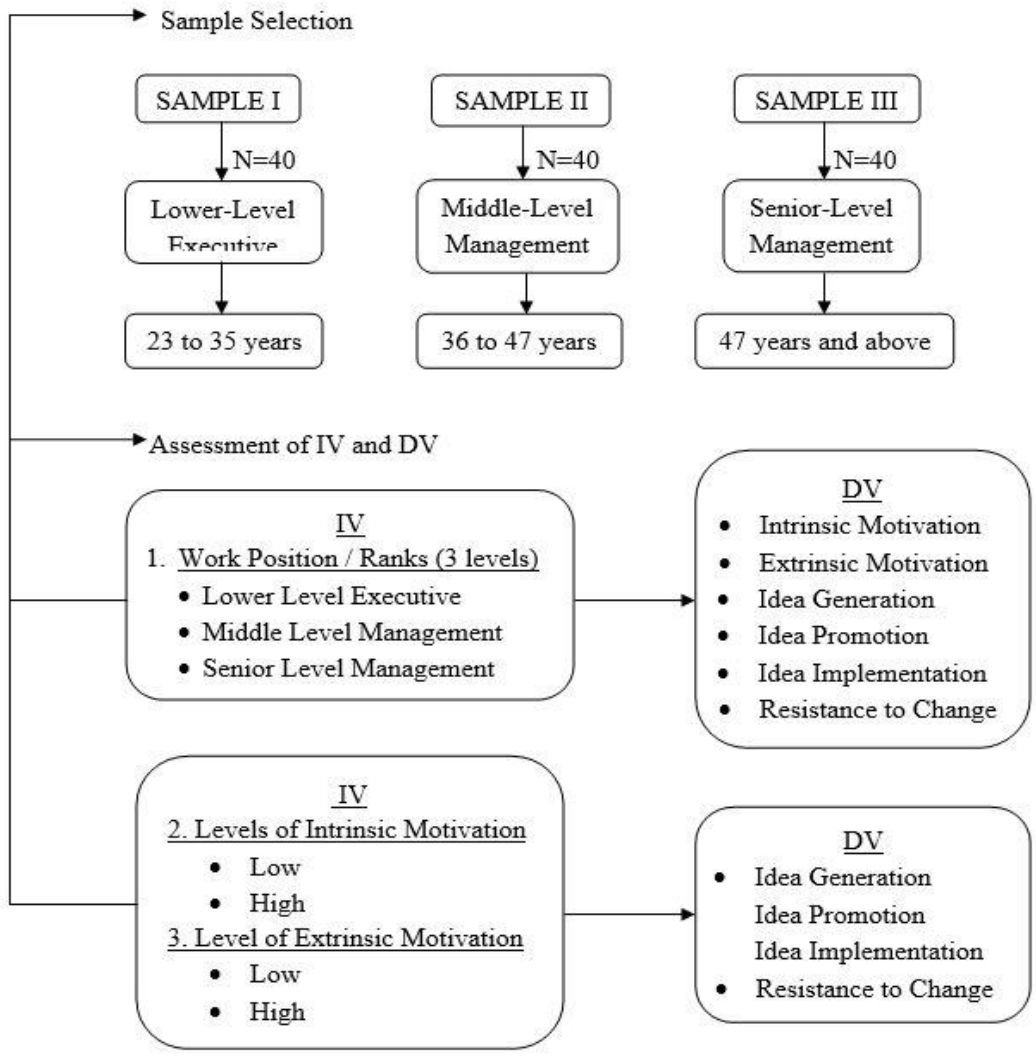

Figure 1: Study Design

Study Assessment Tools

Based on the objectives of the study, the following standardized scales were used to collect the data from various levels of office engineers in manufacturing industries.

1. Innovative Work Behavior questionnaire (Janssen, 2000) - This is a 9-item scale originally developed by Janssen (2000). The scale consists of 3 components: Idea generation, idea promotion, and idea implementation. The reliability of the original scale was 0.85.
2. What Do You Look For in a Job (Frederick Herzberg, 1966) - Measures intrinsic and extrinsic motivation, or what Herzberg called motivators and hygienes. The instrument contains 14 items, 7 related to intrinsic and 7 to extrinsic motivation. It is self-administered and respondents are asked to rank order the 14 items depending on their importance to them: from 1 (highest rank) to 14 (lowest rank). The lower the score, the higher is the value given to the concerned motivational factors. Split-half reliability was found to be 0.88.
3. Resistance to Change questionnaire (Shaul Oreg, 2003) - It consists of 17 items. Respondents are required to rate each item, on a 6-point scale, regarding one's general beliefs and attitudes about change in the respondents' organization. The more frequently these mechanisms are used, the stronger is the resistance to change. These mechanisms are grouped into four subsystems: routine seeking, emotional reaction, short-term focus, and cognitive rigidity. Cronbach's alpha reliability coefficient is 0.92 (Oreg, 2003).

Data Collection & Administration of the tools

- Responses of 120 office engineers of private manufacturing industries were collected and considered through the innovative work behavior, motivation, and resistance to change questionnaire.
- Each subject was approached personally, and after establishing rapport, the questionnaires were administered individually to each respondent, and data was collected.
- The data was collected abide by ethical considerations. Written consent was obtained and confidentiality of the data was maintained.

Data Analysis

The empirical data obtained were subjected to quantitative analysis using descriptive (mean, standard deviation), Leveln's Test, F test, Tukey test, and t-test. The details of the analysis and the results are discussed below.

RESULTS

Mean, SD, Leveln's Test, F test, Tukey test, and t-test were computed with graphical representation. Here, 0.10 was taken as the level of significance due to the sophistication of the study and the population.

Table 1: Mean and SD of various levels of engineers and their corresponding F test of Idea Generation, Idea Promotion, and Idea Implementation

GROUPS	IDEA GENERATION (IG)				IDEA PROMOTION (IP)				IDEA IMPLEMENTATION (II)			
	Mean	SD	F	Sig	Mean	SD	F	Sig	Mean	SD	F	Sig
Lower-Level Executive	14.43	4.02	1.376	.257	14.53	4.44	1.564	.214	14.83	4.37	1.344	.265
Middle Level Management	13.90	4.62			13.20	4.42			13.75	5.42		
Senior Level Management	12.86	4.08			13.03	3.52			13.03	4.98		

Table 1 presents the means, standard deviations, and their corresponding F test among the variables used in the study. The data was coded in such a way that a greater score meant a higher level of IWB. The result shows no significant difference, according to F value, among three groups of engineers according to their working status considering the above three variables, viz., idea generation, idea promotion, and idea implementation.

The graphical representation shows that the mean is slightly higher for lower-level executives across all three phases than the other two levels of engineers i.e., middle-level management, and senior-level management.

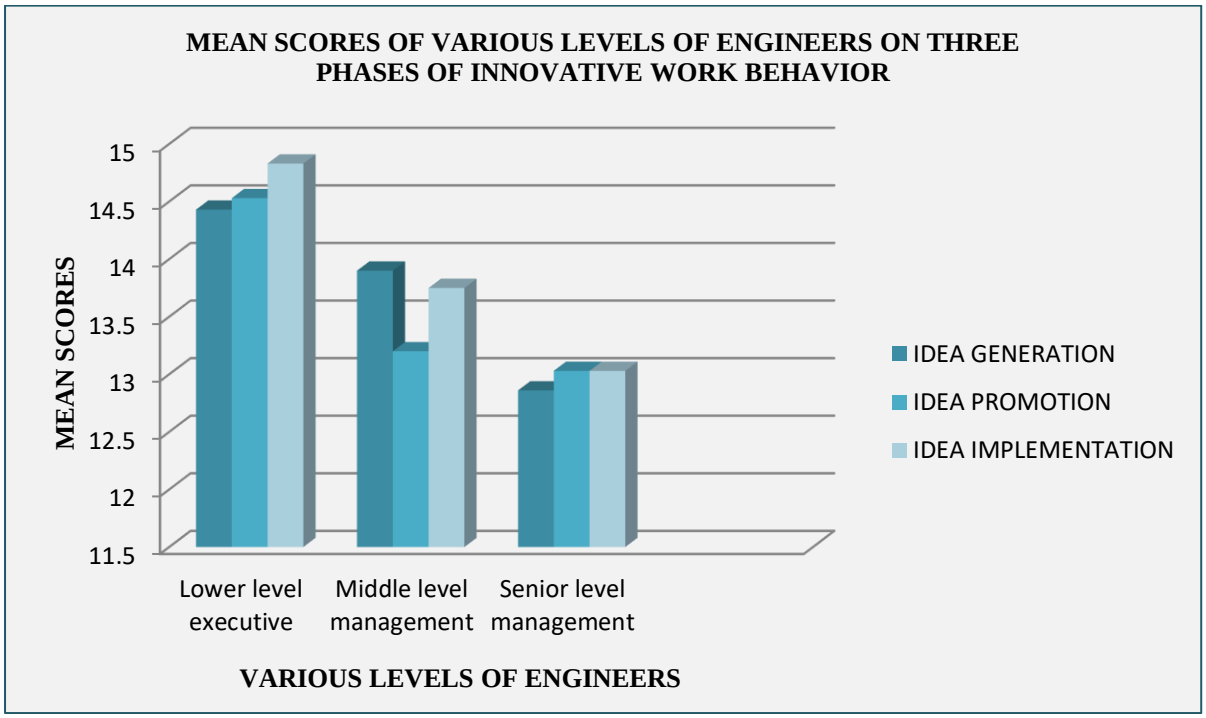

Figure 2: Mean Scores of various levels of office engineers on three phases of innovative work behavior

Table 2: Mean and SD of various levels of engineers and their corresponding F test of Intrinsic Motivation, Extrinsic Motivation, and Resistance to Change

GROUPS	INTRINSIC MOTIVATION				EXTRINSIC MOTIVATION				RESISTANCE TO CHANGE			
	Mean	SD	F	Sig	Mean	SD	F	Sig	Mean	SD	F	Sig
Lower Level Executive	50.75	8.55	2.357	.099*	54.40	8.56	2.800	.065*	55.60	10.93	.392	.677
Middle Level Management	54.45	6.74			50.35	6.75			53.97	7.130		
Senior Level Management	53.12	7.76			51.87	7.76			55.22	7.166		

* $p < 0.10$

As per the results (Table 1 & 2), the obtained F value for all the three phases of innovative work behavior and resistance to change is greater than the critical value. Hence, it can be further said that there is no significant impact of ranking on the three phases of innovative work behavior and resistance to change of engineers working at different levels or ranks. However, it is seen from table 2 that intrinsic and extrinsic motivation differs significantly according to the levels of Engineers.

Higher scores suggest greater resistance to change. It can be illustrated from the graphical representation that the mean scores, the lower-level executives, and the senior-level management execute somewhat greater resistance to change than the middle-level management. The graph further depicts the fact that middle-level management acts as a moderator of challenges arising from the coexistence of the other two types of hierarchy (lower-level executive and the senior level management) and hence there is the resulting need to create synergies between the two.

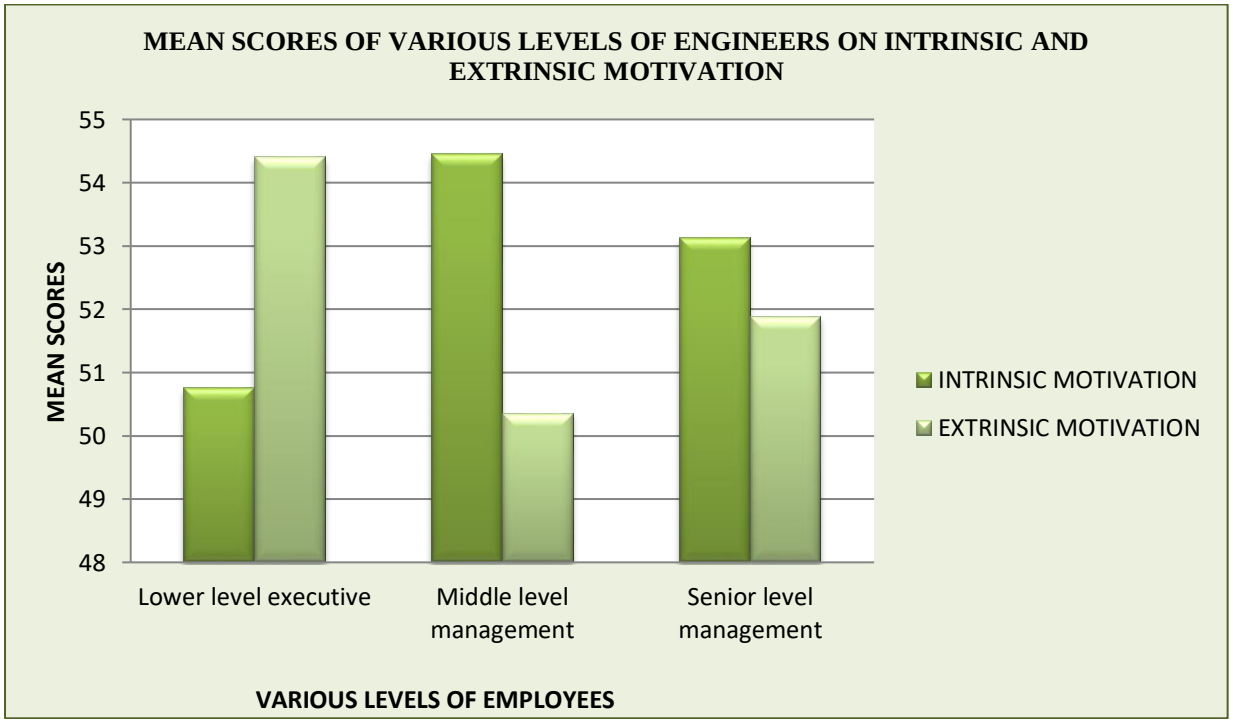

Figure 3: Mean Scores of various levels of office engineers on intrinsic and extrinsic motivation

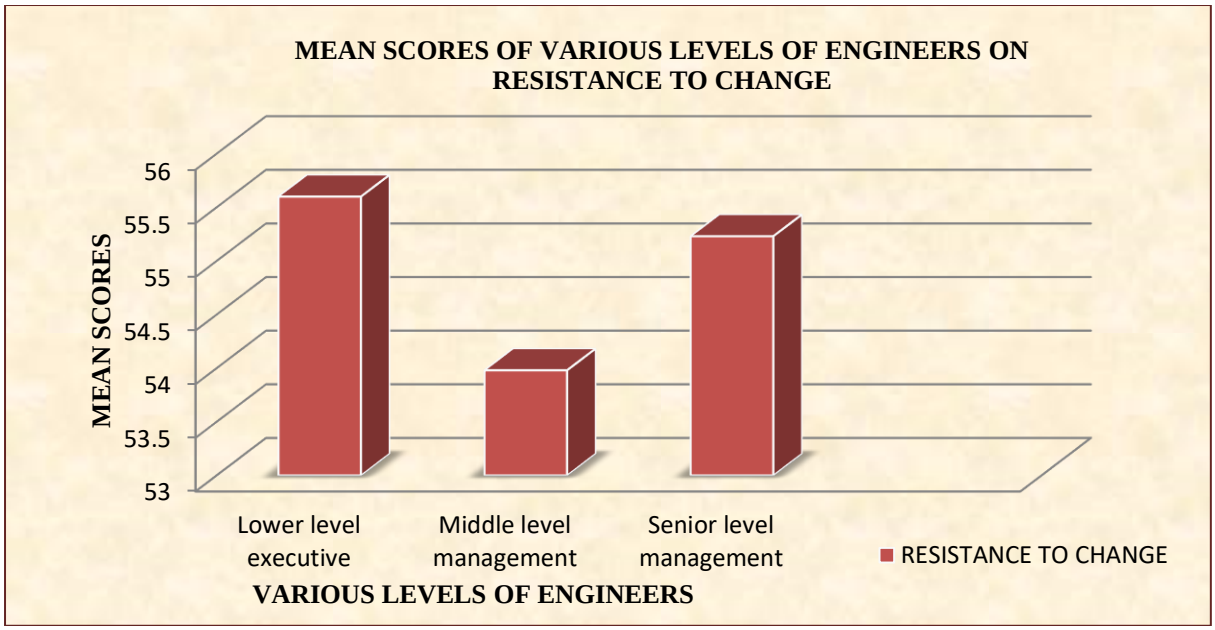

Figure 4: Mean Scores of various levels of office engineers on resistance to change

As can be seen from the means reported in Table 2, when the nature of motivation is concerned, the mean scores of middle-level management of engineers are higher on intrinsic motivation followed by engineers working in senior-level management and lower-level executive. On the other hand, the result shows that lower-level executives of engineers displayed a high level of extrinsic motivation followed by engineers working in senior-level management and middle-level management.

Table 3: Post Hoc Tukey Test of Intrinsic Motivation and Extrinsic Motivation

Multiple Comparisons							
		INTRINSIC MOTIVATION			EXTRINSIC MOTIVATION		
(I) IV Rank	(J) IV Rank	Mean Difference (I-J)	Std. Error	Sig.	Mean Difference (I-J)	Std. Error	Sig.
7	8	-5.7126	2.40288	.053	6.0283*	2.40307	.038
	9	-4.8330	2.46816	.131	5.1487	2.46835	.101
8	7	5.7126	2.40288	.053	-6.0283*	2.40307	.038
	9	.8796	2.27896	.921	-.8796	2.27914	.921
9	7	4.8330	2.46816	.131	-5.1487	2.46835	.101
	8	-.8796	2.27896	.921	.8796	2.27914	.921

*$p < 0.05$

Tukey test showed that lower-level engineers and middle-level engineers differ significantly with the high internal motivation of middle-level engineers whereas lower-level engineers differ from both middle level and senior level engineers in external motivation with higher scores in comparison to both of them.

The engineers then divided according to their scores of intrinsic and extrinsic motivation separately through quartile deviation to ensure the maximization of independence of

independent variables. So, all the subjects, irrespective of their levels in service, were divided into two extreme groups, viz, high and low for each variable.

Table 4: Shows the Mean, SD, and t values of the following variables

Independent Variables	GROUPS	Dependent Variables											
		IDEA GENERATION			IDEA PROMOTION			IDEA IMPLEMENTATION			RESISTANCE TO CHANGE		
		Mean	SD	t	Mean	SD	t	Mean	SD	t	Mean	SD	t
INTRINSIC MOTIVATION	Lower Level	12.9	3.9	0.644	13.9	4.5	0.201	12.2	4.5	2.12*	55.9	11.5	.015
	Upper Level	13.7	4.6		13.6	4.3		14.8	5.1		60.0	6.7	
EXTRINSIC MOTIVATION	Lower Level	12.9	4.6	0.83	13.6	4.2	0.33	12.2	5.1	2.29**	56.0	1.2	0.31
	Upper Level	13.9	4.1		14.0	4.4		15.0	4.5		56.8	2.2	

* $p < 0.03$ ** $p < 0.02$

The important feature of the t-test result table (Table 4) is the variable idea implementation which differs significantly between groups when divided through quartiles for both Intrinsic and Extrinsic motivation. No other variables, viz., idea generation, idea promotion, and resistance to change are significant.

DISCUSSION

This study aims to contribute to the understanding of innovative work behavior, its three phases i.e.; idea generation, idea promotion, and idea implementation, and its implications toward intrinsic motivation, extrinsic motivation, and resistance to change.

As per the links between organizational hierarchical structure and motivation (intrinsic and extrinsic motivation) are explicated, the test results are as expected. As seen from table 2, extrinsic motivation is higher among employees working as lower-level executives whereas; intrinsic motivation is higher among employees working in the middle and senior-level management. This is because intrinsic motivation comes from within (internal source), whilst extrinsic motivation arises from external factors (outward source) and there is a knowledge difference between the groups/levels of management. Thus, it can be said lower-level employee behaviors are more driven by the perceived benefits of the action that they will perform, or in the anticipation of instrumental gain or loss that their activity might lead to a promotion, bonus, or raise in the future (Ryan & Deci, 2000). But, the interesting part of the result is – there is almost no difference between middle and senior-level employees in both intrinsic and extrinsic motivation.

Hence, it can be said that the research result depicted that though the engineers working in lower grades are prone to the objective gain than motivation from within as compared to their counterparts. Whereas, in the case of the middle and higher-ranked engineers, levels of intrinsic and extrinsic motivation were more or less the same for both groups. It can be stated from the result that after achieving the first-grade hierarchy the change in both intrinsic and extrinsic motivation become more or less dormant or, if change, with a very insignificant motion. The reason behind this could also be that after a certain point, intrinsic or extrinsic motivation doesn't act as an impactful reward system to raise levels of employee engagement for middle and senior engineers, as the employees are already empowered to engage in their respective job roles that seem meaningful to them irrespective of any reward. Hence, motivations are not tied to an employee's status in a hierarchy, for exhibiting creative

behaviors. In industry, a continuous urge for potential change and synthesizing information through intrinsic motivation is necessary for better production and innovation. A special counseling session is recommended for this construct.

Moreover, it is evident that when employees are divided into two groups (low & high) according to their scores of Motivation, both intrinsic and extrinsic, the variable idea implementation differs significantly between groups. In both cases, the scores of idea implementation of the group having a high level of motivation, both intrinsic and extrinsic are higher in comparison to their lower counterpart. So, motivation is the key factor of implementation in an industrial setting, be it intrinsic or extrinsic irrespective of the position, i.e., rank order in service. From the descriptive analysis, the same trend, though not significant, is also evident for idea generation and idea promotion. So, as a whole, it can be said that IWB is largely dependent on both intrinsic and extrinsic motivation for all levels of engineers in an industrial setting.

Moreover, the body of knowledge in the existing literature suggests that several factors that may affect strategy implementation can be categorized as leadership style, organizational structure, organizational culture, human resources, and technology (Smith et. al., 2008). These findings also add to existing literature that getting people involved and having a motivating reward system would have a positive influence on the implementation of the strategy.

Intrinsic motivation is indeed the basis of the innovative actions of an individual during task completion. By being happy, satisfied, and enthusiastic at work, an individual would likely feel the freedom to try to create novel and unique ideas thereby explore and implement more new ways or methods in their work. When a person feels that they have more freedom and liberty over their work, they tend to perform better at work. Whereas, when they feel less intrinsically motivated, they do not feel like want to give their best at work. It is the responsibility of administration and management that they should facilitate their employee in terms of a less stressful and conducive working environment so their workability remains at maximum.

Several meta-analyses have proven that the relationship between intrinsic motivation and IWB is significantly positive (De Jesus et. al., 2013; Cerasoli et. al., 2014). Amabile and Pratt's (2016) dynamic componential model of creativity and innovation in organizations also underlines this strong relationship theoretically. An explicitly strong and significantly positive main effect is found between IWB and intrinsic motivation. This implies that the higher the intrinsic motivation, the higher the creative and innovative outcome. This finding confirms the results of earlier research (Hammond et. al., 2011; Liu et. al., 2016; Fischer et. al. 2019) and also supports Amabile and Pratt's (2016) model that the individual component "the intrinsic motivation is a critical predictor for creativity". One reason for this significant effect could be that employees who work on perceived inherently interesting tasks enjoy their work, value their creative thoughts, and devote extra time to their activities/actions, and thereby implement their ideas (Ryan and Deci, 2017). According to the results, it can be stated that the middle and the senior management believes that their knowledge can help to solve job-related problems and improve work efficacy and hence can contribute to organizational performance. Prior studies have indicated that increased intrinsic motivation may be associated with employee willingness to create a constructive mood, in turn leading to increased learning and knowledge sharing (Lin, 2007). Generally, more information is

being processed whilst efforts to develop and implement new and useful ideas are being pursued more persistently (Zhou & Shalley, 2008; Zhang & Bartol, 2010). This, in turn, might increase their intrinsic motivation and so, their creative and innovative outcomes. In addition, previous research findings have provided evidence that employees with complicated tasks (Oldham & Cummings, 1996; Baer et. al., 2003; Fischer et. al. 2019), generally show higher intrinsic motivation and thus leads to greater IWB. By being able to engage in complicated and difficult tasks, it is argued that they could prove their capabilities and skills which would support their basic need fulfillment. In this context, more research is needed to explain the presumed role of the various needs.

CONCLUSION

This study focuses on some new aspects of IWB in employees working in the manufacturing sector. However, the research question remains open as to whether these constructs (viz., intrinsic-extrinsic motivation and resistance to change) significantly affect IWB in other sectors other than the manufacturing sector. More research is needed to link employees' IWB with other variables in different organizational settings and hierarchical structures to foster a comprehensive understanding of their interplay (Dorenbosch et. al., 2005; Anderson et. al., 2014).

Implications, Limitations, and Future Research

An interesting implication of this study is that it is possible to overcome resistance to change through valuable and appropriate organizational practices (e.g., Kotter & Schlesinger, 1979; Levay, 2010) and intrinsic motivation could favor adaptive coping behaviors (i.e., proactive performance or innovativeness) when some innovation-supportive factors (for instances, strategic orientation, innovative work culture with clear work responsibilities, etc.) are present.

This study has is not free from limitations. First, this study was conducted in a single industry (i.e; only manufacturing sector) from only one particular region (Kolkata, West Bengal), which reduces the generalizability of the study. Additional testing across industries and various sectors, with other types of variables affecting IWB, would help extend and validate the hierarchical framework and its antecedents. Second, as with the majority of survey research, this study is cross-sectional, so the direction of effects and inter-relation between variables can be only be suggested and not proved.

More generally, the present findings support the view that the phases of IWB are interconnected and that a focus on intrinsic psychological needs in work settings can contribute to creative behavior in the employees.

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