# Impact of leader-member exchange and appreciation learning climate on the relationship between team resilience and team innovative work behavior

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## ABSTRACT

Teamwork is being valued more than ever, especially since the benefits have started to be recognized. Although the relationship between individual resilience and innovative work behavior has received more attention in the literature, this relationship has been understudied at the team level. The purpose of this study is to (1) find the impact of team resilience on the team innovative work behavior and (2) the moderating effect of leader-member exchange and appreciation learning climate on this relationship. Applying the person-environment fit theory, a data set with a sample of 301 Dutch employees was used to study these impacts. The findings suggest that team resilience positively influences team innovative work behavior. Besides, only the appreciation learning climate positively moderates the relationship between team resilience- adaptive capacity and team innovative work behavior. This indicates that an appreciation learning climate improves the team innovative work behavior when the team has the adaptive capacity which is one of the dimensions of team resilience. Results regarding leader-member exchange are insignificant and therefore the hypotheses, which predicted positive moderating effect, cannot be confirmed. Further researches were conducted based on the gender type and supervisory role of the respondents. The results suggest that the impact of team resilience on team innovative work behavior is significantly positive from the perspective of all respondents. However, from men's perspective, this relationship is stronger than from women's perspective. The women agree that providing an appreciation learning climate and having SLMX relationship with a resilient team would enhance their team innovative work behavior. Meanwhile, from men's perspective, SLMX relationship weakens the team innovative work behavior of a resilient team. Non-supervisor respondents on the other hand convey that appreciation climate improves the team innovative work behavior of resilient teams. These findings provide some meaningful insights for the theoretical and practical world regarding the team resilience and team innovative work behavior.

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## Keywords

Team resilience, adaptive capacity, efficacious belief, Team innovative work behavior, appreciation learning climate, Leader-member exchange, Social-leader member exchange, Economic- leader member exchange

# 1. INTRODUCTION

Innovation has become increasingly important for the success of organizations and it is also a highly relevant topic to survive in the rapidly changing environment (Pandey et al., 2019). In the attempt to gain competitive advantage, make more profit, and to enhance the organization's performance, organizations are actively tapping every possibility, of which encouraging innovative work behavior and promoting teamwork are two most essential parts (Bos-Nehles et al., 2017; De Dreu, 2012; Mathieu et al., 2008; Shanker et., 2017). Innovative work behavior, in general, is a behavior that involves "intentional creation, introduction, and application of new ideas within a work role, group or organization, in order to benefit role performance, the group, or the organization" (Janssen, 2000). Meanwhile, this definition defines innovative work behavior in general, this study specifically focuses on team innovative work behavior (TIWB) which is referred to the innovative work behavior at the team level (Widman et al., 2016).

Teams are defined as "interdependent collections of individuals who share responsibility for specified outcomes" (Sundstrom et al., 1990) and they play a crucial role in the achievements of organizations, especially at organizations where creating innovative products or services individually are very challenging (Hoegl et al., 2004). Recently, researchers who were interested in innovation at the team level have shed light on the social nature of the innovation process which identifies innovation development as an interactive process. This interactive process includes a group of individuals who collectively discuss problems and ideas, share their experiences with prototypes of innovations, and eventually find novel solutions (Widman., 2016).

Just like team innovative work behavior, team resilience is rather a new concept that awoke the interests of researchers in less than two decades. Resilience, a term that is widely known in the health care, sports and military sectors, generally refers to the ability to bounce back from adversities and so far, it has only been mostly studied at the individual and organizational level, rather than team level (Hartwig et al., 2020; Bui et al., 2019). Team resilience is a term that has been built from the resilience phenomenon. Despite the few in-depth differences with the definition of resilience, team resilience similarly refers to a team's capacity to bounce back from adversities or recover from an unanticipated event (Bowers et al., 2017; Hartwig et al., 2020).

Since various advantages such as high job performance and job satisfaction have been addressed in relation to resilience, it is interesting for researchers to further investigate team resilience to seek more benefits (Dimas et al., 2018; Meneghel et al., 2014). Inspired by two studies, which examined the concepts of resilience and innovative work behavior, this study sets forth on examining the relationship between team resilience and team innovative work behavior (Weerd-Nederhof et al., 2019; Oeij, 2017).

The first inspiration of this study is a conference paper (Weerd-Nederhof et al., 2019) which studied the relationship between individual resilience and individual innovative work behavior (IWB) along with some moderating effects of factors such as innovation strategy (exploration and exploitation) and transformational leadership. The finding revealed that individual resilience is in fact positively related to innovative work behavior, however, surprisingly, the organizational environment characteristics, exploration/ exploitation innovation or transformational leadership orientation do not influence individual innovative behavior. These findings raise a question of what this relationship would mean at the team level, and if transformational leadership does not affect IWB, would leader-member exchange have an influence on team innovative work behavior.

The other foundation for this research comes from a bundle of studies regarding team resilience innovative behavior, conducted by Oeij (2017). His studies revealed the importance of innovative resilience work behavior which mediates the mindful infrastructure and team outcomes. Mindful infrastructure is a combination of 'team psychological safety, team learning behavior, team voice, and the leadership style control'. This combination accounts for minimum mistakes in teams or the ability to be back on track when such mistakes or accidents occur.

Although this research provides worthy details, it suggests team innovative resilience work behavior as one factor, and as many other studies, resilience has been analyzed as a mediator rather than the main effect. Nonetheless, the elements of mindful infrastructure, especially leadership control style and team learning behavior, give a direction to test similar factors as moderators in the relationship between team resilience and team innovative work behavior.

From analyzing the aforementioned papers and from further research, it has been found that leader-member exchange, and appreciation learning climate play a significant role in the innovative work behavior of employees (Agarwal et al., 2012; Sung & Choi, 2014). Leader-member exchange refers to the relationship between a supervisor and his or her followers. On the other hand, appreciation learning climate refers to the organizational environment where the effort made by employees to learn is appreciated and rewarded.

Preliminary studies such as Hetland et al., (2011) tested the relationship between leadership and learning climate and found that leadership has the ability to influence learning climate. Other studies have also emphasized the importance of these variables for organizational performance. However, no other published studies could be found which examined their effects independently on the relationship between team resilience and team innovative work behavior.

Drawing upon the person-environment fit theory, this study aims to find the relationship between team resilience and team innovative work behavior as well as the moderating effect of leader-member exchange (LMX) and appreciation learning climate. The person-environment fit is a theory that can be described as the level of alignment between the characteristics of individuals and the environment and this fit can be affected by contextual factors (French et al., 1982; Kristof-Brown et al., 2005). Emerging literature proposes that there are different dimensions of this theory, such as person-group fit, person-innovation fit, and person-supervisor fit (Bam et al., 2019; Choi, 2004). These literatures also suggest that on the secondary level, these dimensions are also applicable at the team level.

Accordingly, this study adopts the team-environment fit where firstly, team resilience can be considered as a team characteristic instead of individual characteristic. Secondly, team innovative work behavior can be considered as a characteristic of an organizational environment. As Boon and Biron (2016) suggest, LMX has the ability to affect this fit, and appreciation learning climate which is part of the organizational context can also influence this fit. Both of these factors are therefore equally important for a team in an organizational environment (Caniëls et al., 2020).

The aim of this study is to firstly identify the impact of team resilience on team innovative work behavior and secondly, to

find the moderating effect of LMX and appreciation learning climate on this relationship. In order to do this, a systematic literature review has been conducted which helped to conceptualize these variables and to build hypotheses. Following the systematic literature review, the hypotheses were tested by using an available set of data from 301 Dutch employees. The results of these empirical tests are presented and discussed in the next section followed by some limitations of the study, practical implications, and a conclusion.

# 2. THEORETICAL BACKGROUND AND LITERATURE

## 2.1 Systematic literature review

A systematic literature review as the name suggests is a type of literature review that systematically analyzes existing literature on a certain topic. This can be done by using keywords to initially search for all relevant papers that might support to answer the research question and then filter the search results by selecting relevant studies. The quality of these studies can be assessed by checking the study type and the methodology applied. The required data can be derived from these studies and later synthesized. An alternative process in the systematic literature review is to use the (reverse) snowball method where literature is collected by finding relevant papers from the reference list of other papers.

This research combines both of these methods and as advanced methods of systematic literature review suggest, this research firstly conceptualizes the important variables and hereafter the variables are operationalized (Armitage et al., 2008).

Using the databases Web of Science, Scopus, and Google scholar, literature for this study were found through basic keywords searches with wildcards applied for Web of Science and Scopus. The wildcards, asterisk (*) and $ symbol were used to find the variant spelling of the terms. For example, papers regarding team resilience were found by searching "team resilie*" and for team innovative work behavior key words such as "team innovative work behav*", "TIWB" and "team innov*" were used. For LMX, "leader-member*", "leader member exchange*" and "LMX" were used and papers regarding appreciation learning climate were found by using terms such as "appreciation learning climate*", "organi$ational learning climate*", "learning climate*" and "reward*".

Although the aim was to search from team-environment fit theory, there was almost no result regarding this subject. Keywords for the person-environment fit theory on the other hand gave wide range of results. Therefore, it was decided to manually select the papers which could answer the relationship between team resilience and team innovative work behavior and the moderating effect of LMX and appreciation learning climate on this relationship.

To find the relationship between the variables, Booleans, for example, AND and OR were used. Exclusion criteria such as papers not in English, papers that did not use employee samples in quantitative analysis, and review papers that did not define the variables were applied. Since this study at the team level is an emerging concept and the different databases held many duplicates, a very limited number of papers were yielded from the database searches. Therefore, from doing the database search and a snowballing method, minimal relevant papers for this study were collected. Regarding team resilience and team innovative work behavior, a total of 3 papers were selected for full text analysis.

To analyze the relationship between innovative work behavior and LMX, 8 papers were used, and for the relationship with appreciation learning climate 4 papers were selected. Besides, these variables on their own were also analyzed and the summary of these findings can be found in Appendix D.

### *2.1.1 Team resilience*

The term 'resilience' was first published in the 1970s and since then it has received attention at different levels such as individual, team, and organizational (Chapman et al., 2018). Literatures regarding team resilience, however, were mostly started to be published from the past decade and the conceptualization of this concept remains ambiguous as the researchers define it from different perspectives.

As Chapman et al., (2018) pointed, an earlier and mostly used definition of team resilience is "the capacity to bounce back from failure, setbacks, conflicts, or any other threat to well-being that they may experience" (West et al., 2009). While this study and many others (e.g. Meneghel et al., 2016; Carmeli et al., 2013) counts team resilience as a capacity, there are also other studies that conceptualize team resilience as a process (Edson, 2012), behavior, outcome or an emergent state(Bowers et al., 2017) in relation to bounce back from failures and dealing with adversities (Hartwig et al., 2020).

These studies also differ in terms of the dimensions they developed. While some studies considered team resilience as unidimensional other studies such as Alliger et al., (2015), Carmeli et al., (2013) and Bowers et al., (2017) considered it as multi-dimensional. Carmeli et al., (2013) defined team resilience as "A team's belief that it can absorb and cope with strain, as well as a team's capacity to cope, recover and adjust positively to difficulties" (Carmeli et al., 2013). This definition, therefore, divides team resilience into two dimensions: 'efficacious belief' and 'adaptive capacity'.

Efficacious belief refers to "beliefs which group members have about their capacity to successfully perform particular tasks" meanwhile adaptive capacity refers to "the ability to sense, interpret, and respond to complexities such that problems are noticed, and capitalized onto cultivating a working system that is capable of adjusting to setbacks and continues to grow"(Carmeli et al., 2013). Both of these dimensions are equally important in a team context and further studies have strengthened this conceptualization by mostly adopting the adaptive capacity dimension. Building from this systematic literature review, team resilience can be conceptualized as a team's belief and team's adaptive capacity which enables the team to bounce back from adversities and deal with challenges.

### *2.1.2 Team Innovative Work Behavior*

Team innovative work behavior has its antecedents in innovative work behavior which means 'intentional creation, introduction, and application of new ideas' for the benefit of the individual, team, or organizational performance (Janssen, 2000). As De Jong and Den Hartog (2007) agreed, this definition directs innovative work behavior towards two phases: the initiation and application of new and useful ideas. The initiation phase consists of different stages such as idea generation and creative thinking meanwhile application refers to implementing these ideas. This makes the distinction between creativity and innovative work behavior clear as creativity only refers to the initial phase of innovative work behavior while innovative work behavior also requires implementing this creativity (De Jong & Den Hartog, 2007; Somech & Drach-Zahavy, 2013).

Developed from the study of West & Farr (1990), De Dreu (2002) further defined team innovation as "the introduction or

application within a team of ideas, processes, products, or services that are new to that team and designed to be useful".

Following these studies, team innovative work behavior can be conceptualized as the behavior of a team that is directed toward the initiation and application of new ideas, processes, products, or services to benefit the team and organization's performance.

### *2.1.3 Leader-member exchange*

Leader-member exchange theory which was originated in the 70's by the scholars George B. Graen and Mary Uhl-Bien, simply focused on the relationship between the leaders and their subordinates (Dienesch & Liden, 1986). Preliminary studies that mostly based their assumptions on social exchange theory suggested that this relationship has a different level of qualities (De Jong & Den Hartog, 2007). The low quality of LMX points out a relationship in which subordinates and leaders have a short-term mutual understanding that is based only on economic exchange and they do not identify them as if they are members of one team. Contrarily, high-quality LMX refers to a relationship in which the leaders and subordinates have a long-term mutual understanding that goes beyond contractual agreements where both of them feel as if they are one team who jointly works for a purpose (Walumbwa et al., 2011).

In the recent literature, these qualities have emerged into two dimensions of LMX which are economic leader-member exchange (ELMX) and social leader-member exchange (SLMX) (Dysvik, 2015, Kuvaas et al., 2012). A study conducted by Kuvaas et al., (2012), which analyzed the effect of LMX on the performance of the workers and organizational citizenship behavior has firstly indicated that ELMX and SLMX are rather two distinct constructs of LMX than different levels of one construction.

Based on these literatures, LMX can be conceptualized as an exchange relationship between leaders and followers which is represented by ELMX and SLMX. ELMX can be defined as an exchange relationship between leaders and followers that is short-term orientated with more focus on marketplace and contractual characters. SLMX on the other hand can be defined as an exchange relationship between leaders and followers that is long-term oriented and is based on mutual trust rather than immediate 'pay-off'.

### *2.1.4 Appreciation learning climate*

Generally, just like an individual, a workplace that is active in continuous learning has more competitive advantages over others who do not. A study by Nikolova et al., (2014) which has divided an organizational learning climate into three dimensions: facilitation learning climate, appreciation learning climate, and error-avoidance climate fill an important part of the gap in the existing literature on this topic. Researchers, mainly from the HRM side, show strong interests in an organizational climate with an appreciation learning climate, as they believe it helps to enhance performance at a different level. As of Nikolova et al., (2014) appreciation learning climate embodies material and non-material rewards. Tracey & Tews (2005) who constructed a scale for the organization's training climate divided the scale into three dimensions, namely managerial support, organizational support, and job support. The first two dimensions also subsumed items that measures the aspects of material support for learning behavior from an organization and managers. Studies such as Kynddt et al., (2009), on the other hand, found the importance of non-material rewards which in this case is the "appreciation and stimulation" of learning that positively influence employee retention. Relying on these literatures, this appreciation learning climate can be conceptualized as part of an organizational climate that provides material and non-material rewards as means of appreciation for valued behavior.

## 2.2 Team resilience and Team innovative work behavior

Both resilience and innovative work behavior have been widely identified as factors that help to improve the performance of an individual or organization. These factors at the team level are also not an exception (Oeij, 2017). However, literature regarding these two variables are emerging at a very slow pace and therefore to build hypotheses, this study has to rely on individual resilience, and individual innovative work behavior.

Recent research by de Weerd- Nederhof and colleagues who studied the relationship between individual resilience and individual innovative work behavior have found a positive relationship (Weerd-Nederhof et al., 2019). Furthermore, a master thesis by Tùng (2019) also revealed that resilience is positively correlated with innovative work behavior. These studies help to support the assumption that these variables at the team level are also positively related. Based on these findings, the following hypothesis regarding team resilience and team innovative work behavior is built.

Hypothesis 1: Team resilience has a positive impact on the team innovative work behavior

## 2.3 Moderating effect of appreciation learning climate and leader-member exchange

### *2.3.1 LMX*

LMX which is referred to as an exchange relationship between leaders and followers has been found by several researchers to have a direct impact on employee's performance (Mumford & Hunter, 2015). Support from leaders in the work environment is necessary not only for the employees but also for a team and the growth of organizations. A recent study aimed at finding the effect of Person-Organization and Person-Team cultural fits on work attitudes and task performance and the moderating effect of supportive leadership on these effects revealed positive results regarding the moderating effect (Lee & Seo, 2019).

Regarding, LMX and innovative work behavior, studies such as Saeed et al. (2019), who based their research at the individual level found out that there is indeed a positive relationship when LMX quality is high. Tùng (2019) also supports the idea that LMX would have a moderating effect, rather than only a mediating effect, in the relationship between resilience and innovative work behavior.

LMX has a high influence on work engagement and the work engagement in turn has been found to be positively related to innovative work behavior (Agarwal et al., 2012). Kuvaas et al., (2012), whose study made the distinction between ELMX and SLMX also revealed interesting results. The result was that economic leader–member exchange relationship was negatively related to both work performance and organizational citizenship behavior while social leader–member exchange relationship was positively related to work performance and organizational citizenship behavior. Assuming that this would also apply at team level, the following hypotheses are proposed.

Hypothesis 2a: Economic leader-member exchange relationship makes the positive relationship between team resilience and team innovative work behavior less positive.

Hypothesis 2b: Social leader-member exchange relationship makes the positive relationship between team resilience and team innovative work behavior more positive.

### *2.3.2 Appreciation learning climate*

Appreciation learning climate, in other words, an organizational climate where continuous learning as part of valued behavior is rewarded, has received more attention in recent years. As such, a study by Nikolova et al., (2014) that analyzed the relationship between organizational restructuring and organizational learning climate revealed that appreciation learning climate was more effective under low working conditions. It has also been recognized as an important predictor for innovativeness even back in the 1990s (Saleh & Wang, 1993). Saleh and Wang (1993) identified that companies that reward entrepreneurial behavior and risk-taking abilities along with management commitment are more innovative than those who do not appreciate these behaviors.

Since these studies provide the support that appreciation learning climate helps to improve innovativeness and performance, it can be predicted that it will also enhance team innovative work behavior and importantly, it will moderate the relationship between team resilience and team innovative work behavior.

Hypothesis 3: Appreciation learning climate makes a positive relationship between team resilience and team innovative work behavior more positive.

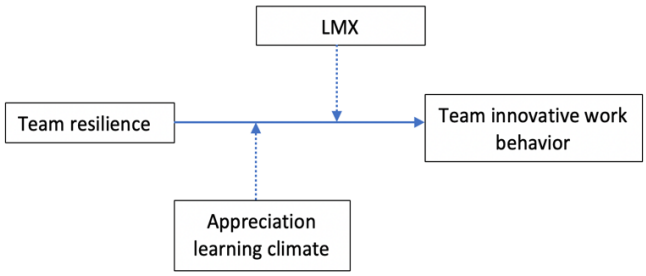


**Figure 1: The framework model**

# 3. METHODOLOGY

## 3.1 Data collection

The data for this study which focuses on finding the impact of team resilience on team innovative work behavior and the moderating effect of LMX and appreciation learning climate on this relationship was collected by using a survey developed by a team of researchers, Dr. De Weerd- Nederhof and Drs.Ir. J.C. Kuijpers and Prof. Dr. Isabella Hatak from the University of Twente and Prof. Dr. Marjolein Caniels from the Open University of the Netherlands. For this research purpose, the data set and a codebook with the questionnaire were provided by Prof. Dr. De Weerd- Nederhof and Drs.Ir. J.C. Kuijpers.

The codebook contains the questionnaire of 24 variables in both English and Dutch. It was translated to Dutch for the convenience of Dutch respondents who were the target group, and then it was translated back in English before the analysis. The online survey was held in the spring of 2019 and although it has reached 450 employees, approximately 333 (74%) of the respondents, sent the filled questionnaire after a one-week period. Out of those, 301 questionnaires (67%) were used for further analysis since the rest contained missing values or unusable data. The respondents' anonymity was guaranteed to receive honest answers an in addition, upon beginning the survey, the respondents provided their informed consent.

## 3.2 Measures

### *3.2.1 Dependent variable*

Team Innovative Work Behavior

The team innovative work behavior was measured by using a four-item scale from the study De Dreu (2002) which intended to measure the team innovation. This scale was initially adapted from Anderson and West (1998) which was answered with a five-point Likert scale ranging from strongly disagree to strongly agree. For this research, the Likert scale was expanded to a seven-point scale where 1= strongly disagree and 7= strongly agree. For considerations regarding interpretation, the following item was reverse coded: "This team gives little consideration to new and alternative methods and procedures for doing their work". The internal consistency between the four scale items was further analyzed by checking the Cronbach's Alpha which gave a result of 0.786. This value confirmed scale reliability and supported further analysis.

### *3.2.2 Independent variables*

Team resilience

Team resilience was measured by using a six-item scale from the study of Carmeli et al., (2013) which was assessed with a seven-point Likert scale where 1= strongly disagree and 7= strongly agree. This scale was divided into two factors which are, resilience as efficacious beliefs, and, resilience as adaptive capacity. Carmeli and colleagues constructed the first three items based on Chen et al., (2001) to measure resilience efficacious belief. The other three items which measured resilience as adaptive capacity were measured with a scale developed by Carmeli and colleagues (Carmeli et al., 2010; Carmeli & Sheaffer, 2008). These three items were reverse coded and checked for scale reliability. The Cronbach's Alpha for this six-item scale was 0.853 which is above 0.75 and it also confirms the scale reliability.

Leader-member exchange

In order to measure leader-member exchange, a scale with eight items from the study Kuvaas et al., (2012) was used. Initially, it was developed by Shore et al., (2006) to measure the two distinctions of LMX which are social and economic exchange relationships. This original scale consisted of sixteen items, however, aimed at measuring the relationship with the organization whereas Kuvaas et al., (2012) aimed at measuring the relationship with the store manager. Therefore, the phrases of the original items were later refined according to the need of Kuvaas et al., (2012). For example, every time the original items stated, 'my organization', it was replaced with 'my store manager'. They both used a five-point Likert scale which was adapted to a seven-point Likert scale for this research. In addition, the phrases of the items were slightly altered by replacing 'my store manager' with 'my supervisor'. It was done on purpose since the goal was to measure the relationship between the supervisor and followers, and therefore specifically mentioning store manager would have raised confusion among respondents. Firstly, LMX was divided into two factors: ELMX and SLMX, both consist of four items each. The Cronbach's Alpha for these two factors were calculated separately and the result was that ELMX had a 0.719 internal consistency meanwhile SLMX had an internal consistency of 0.818. These both values are higher than 0.70 and accounted for a good level of scale reliability (Hair et al., 1998).

Appreciation learning climate

To measure the appreciation learning climate, a scale developed by Nikolova et al., (2014) was used. This scale consisted of three

dimensions which aimed at measuring three different types of learning climate as part of a work climate. These three dimensions are appreciation, facilitation, and error-avoidance. This study focuses only on the appreciation learning climate which is formed of three items. Since the convergent and divergent validity was checked and approved for these three dimensions, only Cronbach's alpha was checked for the appreciation learning climate which resulted in 0.845, and this again confirms a high level of internal consistency.

### *3.2.3 Control variables*

Since the results could be affected by other variables, some of them were chosen to be held constant throughout the analysis. As prior literature suggested, data on the following socio-demographic variables were collected.

Gender: The gender of the respondents was measured by asking whether the respondent is a male or female and out of the 301 respondents 153 (50.8%) were men and 148 (49.2%) were women.

Age: The age of the respondents was measured in years and the result ranged from 19 to 72.

Education level: The respondent's education level was measured by asking for the highest level of education they have obtained in the following manner. 1= primary education, 2= preparatory general and vocational secondary education, 3= junior general secondary education, 4= senior secondary vocational education, 5= senior general secondary education, 6= higher (professional) education(bachelor), 7= higher education (master/ doctoral) and 8= I do not know. Since there were no respondents with primary education and only one respondent did not know his level of education, both of these measures were deleted, and the new construct was created with 5 measures. In the new construct 1= preparatory general and vocational secondary education, 2= junior general secondary education, 3= senior secondary vocational education, 4= senior general secondary education and 5= higher education which combined both bachelor and master's degree level (Education in the Netherlands, n.d). Around 45.8% of the respondents have obtained either bachelor or master's degree from a university or college and the rest were spread over other educational levels.

Tenure: The tenure was measured by asking for the number of years the respondent is working with the current employer.

Other than the socio-demographic variables, the supervisory role of the respondent was also taken into taken.

Supervisory role: The supervisory role was measured by asking for the current role of the respondent, explicitly asking whether the respondent is a supervisor or not. This variable was considered important since this study also examines the relationship between supervisors and followers. It was dummy coded into a dichotomous variable where 1= supervisor and 0= non-supervisor. Out of the 301 respondents, 55 (18.3%) were supervisors meanwhile 246 (81.7%) of them were non-supervisors.

## 3.3 Statistical Analysis

In order to conduct the quantitative analysis for this research which aims to analyze the main and moderation effect of the variables, the statistical software package, IBM SPSS was used. After reverse coding, checking internal consistency and linearity assumptions, the metric variables were mean- centered in order to avoid multicollinearity. The most important steps of the analysis were to conduct a bivariate correlation to check the correlation between the variables and thereafter to run an Ordinary Least Square (OLS) multiple regression to test the strength of the relationships. It was done by building fives models where the main and interaction effects were tested to find the (1) impact of team resilience on team innovative work behavior and (2) the impact of LMX and appreciation learning climate on the relationship between team resilience and team innovative work behavior.

# 4. RESULTS

In this section, results are divided into two parts. The first part deals with primary results which is necessary to answer the research question. The second part contains results from further research, which looks at the research question specifically from the gender perspective and supervisor-role perspective.

**Table 1: Mean, Standard deviation & Correlations**

| | | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Gender | 1.49 | .50 | 1 | | | | | | | | | | |
| 2. | Age | 47.18 | 12.55 | -.115* | 1 | | | | | | | | | |
| 3. | Education | 3.91 | 1.32 | .049 | -.088 | 1 | | | | | | | | |
| 4. | Tenure | 12.71 | 11.57 | -.086 | .039 | .029 | 1 | | | | | | | |
| 5. | Supervisory role | 1.82 | .39 | .018 | .063 | -.089 | -.065 | 1 | | | | | | |
| 6. | TR Efficacious belief | 4.75 | 1.09 | -.030 | -.027 | .154** | .001 | .055 | 1 | | | | | |
| 7. | TR Adaptive capacity | 4.63 | 1.21 | .004 | .051 | .027 | .107 | .082 | .484** | 1 | | | | |
| 8. | ELMX | 3.80 | 1.13 | -.045 | .019 | -.031 | -.076 | -.098 | -.086 | -.249** | 1 | | | |
| 9. | SLMX | 4.39 | 1.21 | -.101 | -.010 | .051 | -.045 | -.083 | .548** | .277** | .007 | 1 | | |
| 10. | ALC | 3.74 | 1.30 | .000 | .044 | .025 | -.047 | -.069 | .394** | .216** | .071 | .462** | 1 | |
| 11. | TIWB | 4.12 | 1.06 | -.055 | -.100 | .096 | .046 | -.002 | .515** | .447** | -.107 | .379** | .456** | 1 |

**Table 2. Hierarchical regression analysis results**

| | Model | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| *Control Variables* | | | | | |
| Gender | .063 | .061 | .060 | .053 | .054 |
| Age | -.122*** | -.122*** | -.122*** | -.126*** | -.126*** |
| Tenure | .032 | .032 | .032 | .037 | .037 |
| (Education) | | | | | |
| Junior General Secondary Education | -.008 | -.006 | -.005 | .002 | .012 |
| Senior General Secondary Education | .011 | .015 | .009 | .010 | .012 |
| Senior Secondary Vocational Education | .107 | .110 | .109 | .110 | .113 |
| Higher Education | .038 | .043 | .038 | .046 | .053 |
| Supervisor | -.003 | -.004 | .001 | -.004 | -.003 |
| *Main effects* | | | | | |
| TR Efficacious belief | .241*** | .242*** | .246*** | .262*** | .265*** |
| TR Adaptive capacity | .242*** | .239*** | .242*** | .235*** | .233*** |
| ELMX | -.041 | -.038 | -.044 | -.031 | -.029 |
| SLMX | .028 | .031 | .032 | .025 | .022 |
| ALC | .306*** | .305*** | .305*** | .302*** | .303*** |
| *Interaction effects* | | | | | |
| TR Efficacious belief x ELMX | | -.028 | | | .001 |
| TR Adaptive capacity x ELMX | | -.007 | | | -.033 |
| TR Efficacious belief x SLMX | | | .031 | | .042 |
| TR Adaptive capacity x SLMX | | | .002 | | -.062 |
| TR Efficacious belief x ALC | | | | -.017 | -.038 |
| TR Adaptive capacity x ALC | | | | .100* | .134** |
| $R^2$ | .417 | .418 | .418 | .425 | .428 |
| $R^2$ change | .417 | .001 | .001 | .008 | .011 |

***p<.01; **p< .05; *p<.10

Dependent Variable: TIWB

## 4.1 Primary Results

In table 1, the bivariate correlation of all the important variables of this study are presented, along with the mean and standard deviations. As it is shown in the table, education is positively correlated (0.154, p<0.01) with team resilience efficacious belief meanwhile other control variables are not correlated with any other main predictor variables or the dependent variable. The two dimensions of team resilience, efficacious belief, and adaptive capacity are however significantly correlated (0.484, p<0.01) with each other. Both of these variables are also strongly correlated with team innovative work behavior which supports the earlier findings from the systematic literature review.

ELMX, which is one dimension of LMX is negatively correlated with team resilience adaptive capacity, but not with team resilience efficacious belief. Surprisingly, it is also not significantly correlated with the team innovative work behavior. However, SLMX which is another dimension of LMX, positively and significantly correlated with both team resilience efficacious belief (.548, p<.01) and team resilience adaptive capacity (.277, p< .01). It is also positively correlated with team innovative work behavior (.379, p<.01) as expected. Moreover, the correlation between both dimensions of team resilience and appreciation learning climate are found to be positive (p<.01). Comparing to LMX, only SLMX is positively correlated with appreciation learning climate (.462, p<.01) meanwhile ELMX is not. Finally, it can be seen from the correlation matrix that appreciation learning climate has a significant positive correlation with team innovative work behavior which again agrees with the earlier findings.

Following the correlation analysis, the hypotheses were tested by conducting a multiple regression analysis. The corresponding results of five models are presented in table 2. In model 1, the effect that only the control variables and main predictor variables have on the dependent variable were tested. The model yielded significant result due to the fact that age, team resilience, and appreciation learning climate have a significant effect on the team innovative work behavior. Age (β= -.122, p<.01) has negative impact on team innovative work behavior and it is also consistent throughout the other models. The two dimensions of team resilience, namely efficacious belief (β= .241, p<.01) and adaptive capacity (β= .242, p< .01) are found to positively influence the team innovative work behavior and they are also consistent in the rest of the models. This result is in line with earlier findings from the literatures and also supports the first hypothesis (H1) which is 'Team resilience has a positive impact on the team innovative work behavior'. Besides, this model also shows that appreciation learning climate (β=.306, p<.01) has a positive effect on team innovative work behavior and its significance level is also stable in the other models.

In the next model, model 2, the moderation effect of ELMX was tested by creating an interaction between ELMX and the two dimensions of team resilience. Although the result of the model (F(15,285)= 13.67, p<.001) was significant and this accounted for 0.1% more variance than model 1, there was no moderation effect of ELMX found. ELMX and team resilience efficacious belief (β= -.028, n.s) and ELMX and team resilience adaptive capacity (β= -.007, n.s) were found to be negatively but insignificantly related and therefore, this model contradicts earlier findings and the hypotheses(H2a) that were built upon them cannot be supported.

Model 3 tested the moderation effect of SLMX on the relationship between the two dimensions of team resilience and team innovative work behavior. It yielded similar results as the second model where the model result was F(15,285)= 13.67, p<.001 and the variance explained by the model increased by 0.1% compared to the initial model. SLMX and team resilience efficacious belief (β= .031, n.s) and SLMX and team resilience adaptive capacity (β= .002, n.s) were positively, but insignificantly related to team innovative work behavior and therefore, the null hypothesis cannot be rejected. In other words, it cannot be said with confidence whether SLMX does or does not make the positive relationship between team resilience and team innovative work behavior more positive.

The following model, model 4, separately tested hypothesis 3, the interaction effect of appreciation learning climate on the relationship between team resilience and team innovative work behavior. This model presented some hopeful results where the model result is F(15,285)= 14.06, p<.001, and the change in variance which can be explained by the independent variable is equal to 0.8%. Testing the appreciation learning climate along with team resilience efficacious belief (β= -.017, n.s) and team resilience adaptive capacity (β= .100, p<.1) yielded positive and significant results for only the adaptive capacity dimension while the efficacious belief is negative but insignificant.

At last, in model 5, all the above-mentioned interactions were tested altogether to find their effect on team innovative work behavior and to assess the robustness of the findings. This model's result is F(19,281)= 11.08, p<.001 with R-squared change of 1.1% compared to the first model. Although compared to model 4, this model did not provide any new significant results, the coefficients were slightly altered. Besides, the positive effect of interaction between appreciation learning climate and team resilience adaptive capacity (β= .134, p<.05) on team innovative work behavior is further strengthened in this model and gives more evidence to partially accept the hypothesis 3.

## 4.2 Results from further research

Since the data gave the possibility to investigate the research topic from different perspectives, two more hierarchical regression analyses were carried out. The first regression analysis divides the results by the gender types, male and female, and this can be found in table 3 in Appendix B. The second regression analysis divides the results by supervisory role of the respondents which can be found in table 4 in Appendix C .

### *4.2.1 Results Gender*

This regression analysis examined the same research question, but the data set was divided by gender and thus aimed at finding the different perceptions of male (n=153) and female (n=148) team members regarding team innovative work behavior.

Although the correlation matrix in table 1 does not suggest any correlation between gender and TIWB or gender and team resilience, there are several literatures such as Ayala & Manzano (2014) and Truss et al., (2012) that proves results regarding resilience and innovative work behavior can differ among men and women. Respectively, these studies found that women are more resilient than men, yet, their engagement in innovative work behavior is less than that of men. These literatures which focused on individual level are still applicable to this study since the questionnaire revealed data from individuals who are members of teams. However, the difference could be because of testing in different contexts. Furthermore, everything else being equal, this regression analysis tested team resilience as one construct rather than the two dimensions.

From the two sets of 5 models in table 3, it can be seen that age has a negative impact on team innovative work behavior for both men and women, but it is only significant for women. Team resilience of both men and women also positively impact team

innovative work behavior as predicted earlier, but the strength of this relationship is somewhat higher for men than women.

Furthermore, all the models of both groups present a positive impact of appreciation learning climate on team innovative work behavior, meanwhile, the two dimensions of LMX, which are ELMX and SLMX, do not reveal any significant results. From analyzing the interaction effects, it becomes clear that for female team members there is a positive and significant moderation effect of SLMX and an appreciation learning climate on the relationship between team resilience and team innovative work behavior. However, this is not the case for male team members. Their result surprisingly reveals that when all the interaction effects are present, then the moderating effect of SLMX on the relationship between team resilience and team innovative work behavior is negative instead of positive. This indicates that for a resilient male team member, having a supportive supervisor does not increase the team innovative work behavior, alternatively, it prevents him from being innovative as a team.

### *4.2.2 Results supervisory role*

Table 4 from the appendix shows the results of a similar investigation of the research question, but this time the data is divided by the supervisory role of the respondents. In this context, it is assumed that non-supervisor respondents are team members who filled the questionnaire about the team they are part of. Supervisors, on the other hand, are assumed to have filled the questionnaire regarding team resilience and team innovative work behavior about the teams they are supervising, and the questionnaire regarding LMX and appreciation learning climate about their own leaders and their organizations. Since this would create conflict in examining the research question, only the data set of 246 non-supervisor team members are fully utilized and from now on, the non-supervisor respondents are mentioned as team members and supervisor respondents are mentioned as team leaders. Both of these groups are independent of each other, which means they are referring to different groups.

In the regression analysis of the perception of team members, age as well as the ELMX dimension of LMX is negatively related to team innovative work behavior. From the perception of both team members and team leaders, team resilience as well as the appreciation learning climate positively impacts team innovative work behavior.

In terms of interaction effects, model 4 and model 5 of team members convey a moderation effect of appreciation learning climate on the relationship between team resilience and team innovative work behavior. This means that when resilient team members are appreciated for engaging in team learning, they would engage in more innovative work behavior.

## 5. DISCUSSION

The main goal of this study is to investigate the impact that team resilience has on the team innovative work behavior and the effect of LMX and appreciation learning climate on the aforementioned relationship. These two contexts were chosen since they are closely related in an organizational environment when looking at them from a team-environment fit lens. The findings from this fill the gap in existing literature regarding resilience and innovative work behavior at the team level. It also shed light on the importance of context in enhancing team innovative work behavior.

Firstly, the most important finding from this study is that both dimensions of team resilience, namely, team resilience efficacious belief, and team resilience adaptive capacity have a positive impact on the team innovative work behavior. This means when a team is capable of adapting to setbacks and holds the belief that they can overcome any challenges, they are actually also able to engage in innovative behavior which includes initiating and implementing new ideas, processes, products, or services (De Dreu, 2007).

Secondly, from analyzing the control variables against the dependent variable, it was found that age has a negative effect on team innovative work behavior, which indicates that the older a team member is, the less he or she is going to be active in activities that promote team innovation work behavior. Although the other control variables such as gender and supervisory role do not reveal any significant findings in the initial results, testing them separately revealed some interesting results which will be discussed later in this chapter.

Looking at the effect of appreciation learning climate on team innovative work behavior, it has been statistically proven that when learning behavior of teams are appreciated, it leads to more innovative work behavior within the team. As such, the team adaptive capacity along with appreciation learning climate strengthens the positive effect on team innovative work behavior. It implies the importance of rewarding resilient teams, especially the ones who has the potential to adapt from adversities, in order to build innovative behavior among the team.

Results regarding the moderation effect of LMX were insignificant and therefore it raises the question of whether the relationship between leader and subordinates really matters in a context of team characteristic and organizational environmental characteristic. When transformational leadership was tested similarly at individual level, Weerd-Nederhof et al., (2019) also found that this leadership style could only matter at a context-free setting.

However, when team resilience is measured as one construct rather than two dimensions, and comparing this result between gender types, some other statistical conclusions were revealed. From the perspective of female team members, the team innovative work behavior of a resilient team can be further strengthened by building a social leader-member exchange relationship. That means that they can be more innovative when their relationship with their supervisors are long term oriented and is based on mutual trust. These resilient female team members also value appreciation learning climate, and therefore when they recognize that their learning behavior is appreciated, they seem to be more innovative than when it is ignored.

From the perspective of male team members, it was found that their results regarding the moderation effect of SLMX are counterproductive when these resilient team members are induced with both LMX and appreciation learning climate factors. This indicates that they would engage in less team innovative work behavior when the relationship with their supervisors exceeds far more than contractual agreements.

When the data is divided by the supervisory role of the respondents and only the non-supervisors are taken into account as team members, more solid conclusions can be made. Similar to the primary results, these team members perceive that team resilience has a positive impact on team innovative work behavior. From their perspective, ELMX negatively influences team innovative work behavior and appreciation learning climate positively influences this behavior. This implies that having a short-term relationship with their supervisors that only focuses on economic benefits does not improve their engagement in innovative work behavior as a team, instead, it prevents them from being innovative. On the other hand, when they realize that their process of learning behavior is recognized and rewarded, they can be engaged in more team innovative work behavior.

The main finding, however, is that when they perceive their team to be resilient, the team innovative work behavior can be more enhanced with the interaction of appreciation learning climate.

Altogether, no matter what role a team member has, he or she proves that from their perspective, when their teams are resilient, they would engage in team innovative work behavior as a whole. In these teams, the innovative work behavior could be enhanced through organizations or managers who reward the team members for their continuous learning behavior.

# 6. LIMITATIONS AND FURTHER RESEARCH

Before providing some suggestions and practical implications, it is important to report some limitations of this study. Disregarding the strengths of this study where highly validated scales and the large sample was used, there are also some serious limitations. The foremost limitation is that although the research question attempts to find an answer at the team level, data could only be found from 301 individuals who represent different teams. Therefore, the results are perceptions of that one individual only, instead of multiple team members. Bias could be detected at this point from the fact that they answered questions regarding LMX and appreciation learning climate from their own perspective rather than seeing them as part of a team which is important for this study. Therefore, it is questionable whether the sample is representative of this study in a team context. Besides, when studying the research topic from a different perspective such as dividing it at a supervisory role, it should have been clearly explained for whom they should fill the questionnaire. Hence, unnecessary confusions regarding which role they represent could have been mitigated.

Furthermore, this study does not reveal any causal relationship as the data is collected from the first wave only. In research where variables such as resilience, innovative work behavior, LMX, and learning climate are subject to change, it is beneficial to test them in several periods to determine their causal relationships. Therefore, this test is missing the longitudinal approach.

In the future, nested research could be conducted to further strengthen this study. This means the data should be collected from different members of a team, the team as a whole, and the leaders who supervise these teams in order to build strong conclusions. This way the variables, especially the dependent variable, team innovative work behavior, could be objectively measured rather than subjectively. Such research also allows to eliminate the number of biases in the findings. Another recommendation is to conduct a longitudinal research which helps to find causal relationships. In fact, to be more precise, an in-depth interview among several teams can be conducted rather than handing out surveys where both the researchers and the participants have to deal with ambiguity.

## 6.1 Practical and managerial implications

Although there are several limitations and biases in this study, one matter is certain from all the results. Having a resilient team in an organization increases their team innovative work behavior which consequently increases the innovativeness of the organization (Widman et al., 2016). Therefore, managers should identify ways to make their working teams resilient and when a team is already resilient, they should not stop encouraging this characteristic of the team. In order to benefit from team innovative work behavior, managers can reward those teams that have the adaptive capacity and are engaged in team learning. Hence, the teams will feel more appreciated and work toward becoming more innovative (Saleh & Wang, 1993).

As the other results suggest, it is important to have women in a team since, from their perspective, there is more possibility to enhance their team innovative work behavior through exchanging a social-leader member relationship when their team is resilient. They also believe appreciating their learning behavior in a resilient team would increase their team innovative work behavior. However, when dealing with men in resilient teams, managers should be careful not to build a long-term relationship with them, since men perceive SLMX along with team resilience to negatively influence team innovative work behavior.

Based on the results of the supervisory role, it can be advised for managers of non-supervisor team members to create a learning climate where these team members could recognize that their learning behavior is being appreciated. When they are resilient, it is more important, as such appreciation learning climate can enhance their team innovative work behavior.

# 7. CONCLUSION

This study which focused on finding (1) the impact of team resilience on team innovative work behavior as well as (2) the moderating effect of LMX and appreciation learning climate on this relationship revealed some implications for both existing literature and for the practical world. The results suggest that team resilience which consists of the efficacious belief and adaptive capacity indeed positively influences the innovative work behavior of teams. Besides, when the teams have the capacity to adapt to challenges, supporting them with rewards for their team learning behavior at the same time would increase their team innovative work behavior which is beneficial for the innovation and performance of the organization (Bergström et al., 2015).

Since this study holds some biases, further researches can be conducted at the team level with data representing all members of a team, with self-rated and supervisor-rated values for better understanding. Further research can be also conducted at the organizational level rather than the team level to research in a wider context.

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# 10. APPENDICES

## 10.1 Appendix A: Questionnaire items

Available upon reque

## 10.2 Appendix B: Results- Gender

**Table 3. Hierarchical regression analysis results (Gender)**

| | Gender | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Female | | | | | Male | | | | |
| | Models | | | | | Models | | | | |
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Age | -.207*** | -.206*** | -.217*** | -.211*** | -.215*** | -.018 | -.018 | -.024 | -.019 | -.028 |
| Tenure | .058 | .064 | .043 | .049 | .047 | -.024 | -.025 | -.028 | -.023 | -.028 |
| Junior General Secondary Education | .014 | .013 | .010 | .029 | .021 | -.079 | -.076 | -.084 | -.079 | -.081 |
| Senior General Secondary Education | .117 | .129 | .112 | .091 | .106 | -.075 | -.073 | -.077 | -.075 | -.072 |
| Senior Secondary Vocational Education | .169 | .183 | .195 | .190* | .212** | .052 | .052 | .048 | .051 | .036 |
| Higher Education | .142 | .150 | .156 | .178 | .182 | -.066 | -.061 | -.068 | -.066 | -.065 |
| Supervisor | -.006 | -.012 | -.001 | .000 | -.004 | .028 | .028 | .015 | .029 | .018 |
| Team resilience | .368*** | .360*** | .397**** | .423*** | .419*** | .473*** | .472*** | .484*** | .474*** | .490*** |
| ELMX | -.004 | .005 | .002 | .008 | .014 | -.083 | -.083 | -.069 | -.083 | -.057 |
| SLMX | .028 | .028 | .035 | .030 | .034 | .026 | .031 | -.004 | .028 | .004 |
| ALC | .330*** | .330*** | .330*** | .310*** | .316*** | .266*** | .264*** | .269*** | .263*** | .246*** |
| TR_ELMX | | -.048 | | | -.038 | | -.020 | | | -.045 |
| TR_SLMX | | | .151** | | .102 | | | -.089 | | -.138* |
| TR_ALC | | | | .157** | .108 | | | | .008 | .071 |

p<.01***, p<.05**, p<.1*

Dependent Variable: TIWB

## 10.3 Appendix C: Results- Supervisory role

**Table 4. Hierarchical regression analysis results (Supervisory role)**

| | Supervisory role | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Non-supervisors | | | | | Supervisors | | | | |
| | Models | | | | | Models | | | | |
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Gender | .071 | .070 | .063 | .060 | .057 | -.038 | -.037 | -.052 | -.042 | -.051 |
| Age | -.139*** | -.138*** | -.140*** | -.146*** | -.144*** | -.052 | -.090 | -.068 | -.071 | -.109 |
| Tenure | -.009 | -.012 | -.009 | -.003 | -.006 | .157 | .217* | .144 | .131 | .196 |
| Junior General Secondary Education | -.017 | -.016 | -.016 | -.014 | -.013 | .184 | .278* | .111 | .129 | .193 |
| Senior General Secondary Education | .004 | .008 | .002 | -.002 | .002 | .237 | .363* | .108 | .161 | .220 |
| Senior Secondary Vocational Education | .113 | .114 | .114 | .103 | .105 | .435* | .666** | .169 | .269 | .368 |
| Higher Education | .041 | .045 | .040 | .040 | .043 | .441* | .680** | .208 | .256 | .406 |
| TR | .390*** | .384*** | .396*** | .418*** | .411*** | .438*** | .415*** | .463*** | .462*** | .446** |
| ELMX | -.100* | -.098* | -.104** | -.089* | -.087* | .336*** | .380*** | .327*** | .320*** | .366** |
| SLMX | .048 | .055 | .058 | .058 | .067 | -.243* | -.269** | -.318** | -.244* | -.336** |
| ALC | .301*** | .298*** | .301*** | .277*** | .274*** | .439*** | .439*** | .505*** | .482*** | .511*** |
| TR_ELMX | | -.042 | | | -.041 | | -.168 | | | -.164 |
| TR_SLMX | | | .070 | | .013 | | | -.274** | | -.242* |
| TR_ALC | | | | .110** | .104* | | | | -.136 | -.045 |

p<.01***, p<.05**, p<.1*

Dependent Variable: TIWB

## 10. 4 Appendix D: Systematic Literature Review Summary

| Topics | Author & Year | Title | Method | Sample | Theory | Main findings | Source |
|---|---|---|---|---|---|---|---|
| TIWB | Dreu (2002) | Team innovation and team effectiveness:<br>The importance of minority dissent and reflexivity | Quantitative analysis | 32 teams | N.A | When the team reflexity level and minor dissent level are high, then the team effectiveness and team innovation are also high.<br><br>Team innovation is needed for a team to be effective | European Journal of Work and Organizational Psychology |
| | Widmann et al., (2016) | The Impact of Team Learning Behaviors on Team Innovative Work Behavior: A Systematic Review | Systematical literature review | 31 articles | N.A | Developing team learning behavior positively influence TIWB | Human Resource Development Review |
| | Somech & Drach-Zahavy (2013) | Translating Team Creativity to Innovation Implementation: The Role of Team Composition and Climate for Innovation | Quantitative analysis | 96 primary care teams | Interactional approach | Aggregated individual creative personality and functional heterogeneity promotes team creativity. When the climate for innovation is high, then team creativity increase innovation implementation. | Journal of Management |
| Team Resilience | Carmeli et al., (2013) | Cultivating a resilient top management team: The importance of relational connections and strategic decision comprehensiveness | Quantitative analysis | 500 firms | Upper Echelon Theory<br><br>Broaden-and-build theory | "(1) connectivity is positively related to strategic decision comprehensiveness, (2) strategic decision comprehensiveness is positively associated with both forms of TMT resilience, and (3) connectivity is indirectly, through strategic decision comprehensiveness, related to both TMT resilience–efficacious beliefs and TMT resilience–adaptive capacity." | Safety sciences |
| | Vera et al., (2017) | May the force be with you: Looking for resources that build team resilience | Quantitative analysis | 1,167 employees nested in 194 work teams (team level) from 38 organizations (organizational level) | Conservations of resources theory | Team level resources (collective efficacy, transformational leadership and teamwork) and organizational healthy practices are positively related to team resilience. | Journal of Workplace Behavioral Health |

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| | Hartwig et al., (2020) | Workplace team resilience: A systematic review and conceptual development | Systematic literature review | 35 articles | Conservations of resources theory<br><br>Multilevel Theory | Conceptualization of team resilience | Organizational Psychology Review |
| | Dimas et al., (2018) | Bouncing Back from Setbacks: On the Mediating Role of Team Resilience in the Relationship Between Transformational Leadership and Team Effectiveness | Quantitative | Ninety teams (445 employees from 40 companies) | Transformational leadership theory | Team resilience mediate the positive relationship between transformational leadership and team effectiveness. Supervisors should adopt transformational leadership. | The Journal of Psychology |
| | Alliger et al., (2015) | Team resilience: How teams flourish under pressure | Study | N.A | N.A | Teams can increase their resilience by developing behavioral strategies which minimize (before), manage (during) and mend (after) difficult pressures, stressors and difficult circumstances. | Organizational Dynamics |
| | Chapman et al., (2018) | Team resilience: A scoping review of conceptual and empirical work | Review | 27 papers | Multilevel theory | Definitions of team resilience | An International Journal of Work, Health & Organisations |
| | Meneghel et al., (2016) | Job-related antecedents of team resilience and improved team performance | Quantitative analysis | 1,633 employees, nested in 275 teams from 52 Spanish small and medium enterprises | Conservations of resources theory<br><br>Multilevel Theory | Team resilience partially mediates job social resources and team performance. But job demands negatively moderate job social resources and team resilience | Personnel Review. |
| | Meneghel et al., (2016) | From social context and resilience to performance through job satisfaction: A multilevel study over time | Quantitative analysis | 305 white-collar employees, clustered in 67 work-units | Conservations of resources theory<br><br>Multilevel Theory | "Individual job satisfaction fully mediates the relationship between collective perceptions of social context and individual job performance and the relationship between individual work resilience and individual job performance" | Human Relations |

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| | Meneghel et al., (2014) | Feeling Good Makes Us Stronger: How Team Resilience Mediates the Effect of Positive Emotions on Team Performance | | 1,076 employees nested in 216 teams from 40 companies | Broaden and Build theory of Fredrickson | Team resilience mediates the relationship between collective positive emotions and team performance | Journal of Happiness Studies |
| | Bergström et al., (2015) | On the rationale of resilience in the domain of safety: A literature review | Review | 61 papers | High reliability theory<br><br>Resilience theory | Importance of adaptive capacity | Reliability Engineering & System Safety |
| | Edson (2012) | A complex Adaptive Systems View of Resilience in a Project Team | Quantitative analysis | 200 students | Grounded theory<br><br>Complex adaptative systems theory | Adaptive capacity is important for building resilient organizational culture. | Systems Research and Behavioral Science |
| LMX | Kuvaas et al., 2012 | Economic and social leader–member exchange relationships and follower performance | Quantitative analysis | 552 followers and 78 leaders | Social-exchange theory | Economic leader–member exchange relationship negatively influence work performance and organizational citizenship behavior.<br><br>Social leader-member exchange relationship positively influence work performance and organizational citizenship behavior. | The Leadership Quarterly |
| | Agarwal et al., 2012 | Linking LMX, innovative work behaviour and turnover intentions The mediating role of work engagement | Survey | 979 Indian managerial employees | LMX theory<br><br>Social Exchange theory | The finding was that work engagement is positively correlated with IWB and negatively correlated with intention to quit. Besides, it mediates the relationship between LMX and IWB and partly mediates intention to quit. | Career Development International |
| | Janssen (2000) | Job demands, perceptions of effort–reward fairness and innovative work behaviour | Survey | 170 non-management employees | Person-environment fit theory<br><br>Social exchange theory | Job demand is positively related to IWB when employees think that their efforts are fairly rewarded rather than unfairly rewarded. | Journal of Occupational and Organizational Psychology |
| | Walumba et al., (2011) | How Leader-Member exchange influences effective work behaviors: | Quantitative analysis | Nurses | LMX theory | LMX helps to increase job performance and organizational citizenship behaviors | Personnel Psychology |

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| | | Social exchange and internal-external efficacy perspectives | | | Social Exchange theory | | |
| Appreciation learning climate | Nikolova et al. (2016) | Learning Climate and Workplace Learning Does Work Restructuring Make a Difference? | Quantitative analysis | 1013 Dutch employees | Conservations of Resources theory | The results showed that work restructuring moderated the hypothesized relationships. Under conditions of high restructuring, facilitation learning climate was an important predictor of learning outcomes; yet, under conditions of low work restructuring, appreciation learning climate was more effective. | Journal of Vocational Behavior |
| | Van der Heijde et al., (2018) | Learning Climate perceptions as a determinant of employability: An empirical study among European ICT professionals | Quantitative analysis | 967 pairs (self-rated and supervisor-rated) | N.A | Age negatively impact the perception of learning climate, however learning climate has a positive influence in employability. Older employees in managerial positions benefit less from psychological learning climate than older employees in non-managerial positions. | Frontiers in psychology |
| | Tracey & Tews (2005) | Construct Validity of a General Training Climate Scale | Quantitative analysis | 32 graduate business students | N.A | This study constructed the general training climate scale<br>1. Management support<br>2. Organizational support<br>3. Job support | Organizational Research Methods |
| | Kyndt, Dochy, Michielsen et al. (2009) | Employee Retention: Organisational and Personal Perspectives | Quantitative and qualitative | 349 questionnaire & 11 interviews | Gap approach & appreciative approach | Individual differences affect employee retention. Leadership, skills, seniority and appreciation and stimulation of learning and work climate have a positive impact on employee retention. However, those who are not ready to learn or take initiative to learn have negative impact on retention. | |
| Combined topics | Atatsi et al., (2019) | Factors affecting employee performance: a systematic literature review | Systematical literature review | 81 articles | Social Exchange theory | Innovative work behaviour, Leader-member exchange, Organizational citizenship behaviour, Individual learning and Team learning enhance Employee performance, | Journal of Advances in Management Research |
| | Mathieu et al., (2008) | Team Effectiveness 1997-2007: A Review of Recent Advancements and a Glimpse Into the Future | Review | 10 years old studies | N.A | Different contexts | |

| Topics | Author & Year | Title | Method | Sample | Theory | Main findings | Source |
|---|---|---|---|---|---|---|---|
| Team Resilience & TIWB | Weerd-Nederhof et al., 2019 | Individual Resilience for Innovation: Does Context Matter? | Quantitative analysis | 62 employees | Person-Environment fit | Individual resilience positively impacts innovative work behavior. Neither transformational leadership nor innovation strategy(exploitation/ exploration) moderate this relationship. | Conference paper |
| | Oeij (2017) | The resilient innovation team. A study of teams coping with critical incidents during innovation projects<br><br>"Chapter 2: Can teams benefit from using a mindful infrastructure when defensive behaviour threatens complex innovation projects?" | Interview Case study & Survey | Survey (150) | N.A | "The elements of mindful infrastructure - team psychological safety, team earning behaviour, team voice and the leadership style control – were associated with Team IRB. Similar to study 1, this study found perceived project complexity did not influence Team IRB. Further, mindful infrastructure was positively associated with project outcomes (perceived project success and perceived project progress), but this relation was significantly stronger when Team IRB was present at the same time. Team IRB mediated the relation between mindful infrastructure and project outcomes." | E-book with collections of papers<br><br>Chapter 2- International Journal of Project Organisation and Management |
| LMX & TIWB | Lee & Seo (2019) | Are There Differences in the Effects of PO and PT Cultural Fits on Work Attitudes and Task Performance? The Moderating Effect of Supportive Leadership. | Longitudinal study | 1539 members of 181 teams | N.A | P-O cultural fit and P-T cultural fit are positively related to organizational commitment. P-T cultural fit is also positively related to team commitment and task performance. Supportive leadership moderates the relationship between P-T cultural fit and organizational and team commitment. | Sustainability |
| | Tùng (2019) | The Impact of Burnout on Innovative Behavior Under the Influence of Individual Resilience and Environment Effects | Quantitative analysis and Systematic literature review | 302 employees | Person-Environment fit | Individual resilience makes the connection between burnout and innovative work behaviour more negative and SLMX makes this connection less negative.<br><br>Individual resilience is positively correlated with innovative work behavior. | UT Thesis repository |

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|---|---|---|---|---|---|---|---|
| | Agarwal et al., (2012) | Linking LMX, innovative work behaviour and turnover intentions The mediating role of work engagement | Survey | 979 Indian managerial employees | LMX theory<br><br>Social Exchange theory | The finding was that work engagement is positively correlated with IWB and negatively correlated with intention to quit. Besides, it mediates the relationship between LMX and IWB and partly mediates intention to quit. | Career Development International |
| | Kuvaas et al., (2012) | Economic and social leader–member exchange relationships and follower performance | Quantitative analysis | 552 followers and 78 leaders | Social-exchange theory | Economic leader–member exchange relationship negatively influence work performance and organizational citizenship behavior.<br>Social leader-member exchange relationship positively influence work performance and organizational citizenship behavior. | The Leadership Quarterly |
| | Monica Hu, Meng-Lei, et al. (2012) | Effects of social exchange and trust on knowledge sharing and service innovation | Quantitative analysis | 466 employees | Social-exchange theory | "LMX quality and TMX quality mediated the relationship between KS and service innovation, and that trust moderated the relationship between KS and both LMX quality and TMX quality. These findings can be applied to improve communication among employees, enhance knowledge sharing, and promote service innovation." | Social Behavior and Personality: an international journal |
| | Saeed et al. (2019) | Leader-member exchange and innovative work behavior | Quantitative analysis | 323 employees and their immediate supervisors (121) from automotive industry. | N.A | "The results showed that leader–member exchange, CSE and domain knowledge interacted to affect employee innovative work behavior in such a way that when CSE and domain knowledge were both high, leader–member exchange had the strongest positive relationship with innovative work behavior and creative process engagement mediated this relationship." | European Journal of Innovation Management. |
| | Agarwal et al (2014). | The role of social exchange on work outcomes: a study of Indian managers | Quantitative analysis | 1302 managers | N.A | "leader–member exchanges and perceived organization support relate to psychological contract breach, which, in turn, relates to affective commitment, intention to quit and innovative work behaviours. Trust in employer mediated psychological contract breach and work outcomes." | The International Journal of Human Resource Management |
| | Denti et al. (2016) | Modeling the link between leader-member exchange and individual innovation in R&D | Quantiative analysis | 166 R&D team members, 43 team leaders, | N.A | "Individuals' inclination to take personal initiative predicted individual innovation, while intrinsic motivation and leadership (conceptualised by | International Journal of |

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| | | | | and 10 department managers | | leader–member exchange (LMX) theory) did not. A mediating effect was found whereby LMX was associated with individual innovation through the personal initiative of team members. Organisational support moderated the relationship between LMX and individual initiative. High organisational support strengthened the relationship." | Innovation Management |
| Appreciation learning climate & TIWB | Nikolova et al., (2016) | Learning Climate and Workplace Learning Does Work Restructuring Make a Difference? | Quantitative analysis | 1013 Dutch employees | Conservations of Resources theory | The results showed that work restructuring moderated the hypothesized relationships. Under conditions of high restructuring, facilitation learning climate was an important predictor of learning outcomes; yet, under conditions of low work restructuring, appreciation learning climate was more effective | Journal of Vocational Behavior |
| | Saleh & Wang (1993) | The Management of Innovation: Strategy, Structure, and Organizational Climate | Quantitative analysis | 20 innovative companies 23 less innovative companies | N.A | The results shows that the innovative companies use or have more of the following than the less innovative ones: "calculated risk taking; management commitment to entrepreneurial activities and innovation; integration and intermingling of talents in teams and task forces; group and collective orientation; and a reward system that reinforces entrepreneurial behaviour". | IEEE Transactions on Engineering Management |
| | Jiménez-Jiménez & Sanz-Valle, R. (2011). | Innovation, organizational learning, and performance | Quantitative analysis | data from 451 Spanish firms | N.A | Organizational learning affects innovation and they both affect business performance. These relations are moderated by the size and age of the company and the industry and environmental turbulence. | Journal of business research |
| | Edmondson, A. (1999). | Psychological safety and learning behavior in work teams | Multimethod field study | 51 work teams | N.A | Team psychological safety and learning behavior are related, but team efficacy is not. Learning behavior mediates the relationship between team psychological safety and team performance. Team structures (context support and team leader coaching) and shared beliefs affect team outcomes. | Administrative science quarterly |