The effects of organizational justice on innovative work behavior: A multilevel analysis

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Abstract— **In this research, we examine the effect of team interpersonal justice climate (defined as common perceptions of fair interpersonal treatment among colleagues) on individuals' innovative behaviors. Precisely, we test a serial mediation model so that team interpersonal justice climate causes team identification, which in turn causes a collective work engagement, ultimately leading to individual innovative work behavior. Thereby, we examine the role played by the group engagement model and the Job Demands-Resources model of this mediation mechanism. Survey data collected from 220 employees nested in 24 teams from different Tunisian companies were tested using a multilevel modeling by structural equation approach. The results show the impact of the team's interpersonal justice climate on individuals' innovative behaviors through team identification and collective work engagement. A discussion of the theoretical and practical implications will be set up.**

I. INTRODUCTION

Innovation plays an essential role in organizational competitiveness [1]. Organizations depend heavily on their employees who are at the origin of all innovative initiatives [2]. Researchers have increasingly recognized the importance of individual innovative behaviours defined as an intentional attempt to introduce and implement new ideas, products, processes or procedures within the framework of the work, group or organization [3]. For decades, they have studied the antecedents of these behaviors [4].Taking the example of organizational justice.

A minority of previous research has examined the effects of perceptions of justice at higher levels of analysis ([5], [6]). Indeed, the members of the team share their common appreciations of justice [7]. As shared information and organizational experiences arise from common interactions, team members potentially share perceptions of fairness regarding their organization as well as their supervisor. They can form a shared climate defined as a justice climate if their perceptions converge [8]. Justice climate refers to "*a shared cognition at the team level regarding how a working team as a whole is treated*" [9]. Although justice climate predicts the attitudes and behaviors of employees at work [10], a few studies to our knowledge have examined the effects of justice climate on individual innovative behaviors. Very little attention has been paid to the mechanisms underlying such effects.

Unraveling the impact of justice climate on individual innovative behaviors allows us to understand the interaction of individuals with their proximal work team in order to innovate [11].However, few empirical studies show improvement in individual innovative behavior in a team context [12]. Yet teams represent a pervasive social context in which individual innovation is implemented [13]. Our research will therefore expand previous research on the team-individual interaction in the context of innovation by trying to clear up how the interface between the team and the individual works by impacting the innovation of those individuals who, due to a justice climate, will participate at innovative actions. As such, our research will suggest a multi-level approach to study the impact of team-level variables on the individual innovative behavior of employees. Based on the group engagement model [14] and the Job Demands-Resources Model [15], an examination of the serial mediating role of group identification and collective work engagement at the team level will be established. Figure 1 illustrates the proposed model.

FIGURE I. Conceptual Multilevel Model

II.   THEORY
DEVELOPMENT
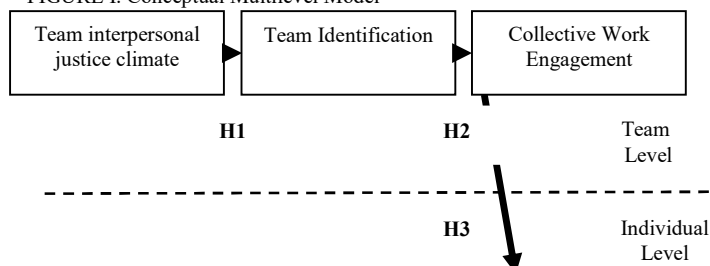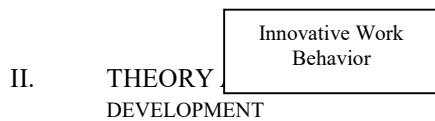
A. Team interpersonal justice climate and Team identification

On the rise to the popularity of teamwork structures in organizations, teams have seen a progressively large presence in organizational research [16]. Researchers have studied the influence of team's interpersonal justice climate, or a common perception of equitable interpersonal treatment among colleagues [7]. One explanation for the team's interpersonal justice climate effects lies in social identity theory [17], which suggests that respectful treatment of individuals by their colleagues as well as a non-use of inappropriate language and gestures by the latter in their interactions, will develop a sense of shared identity within the team. Additionally, they will be most probably to act as a cohesive unit and derive a collective sense of self-worth as a team member [5]. Thus, the process of social identity should occur at the team level and serve as a mechanism linking justice climate to the results of the team [18], such as team identification at the team level, defined as "*a shared feeling of attachment and belonging of members to their teams*" [19].

Empirically, the relationship between organizational justice and social identity has been often shown at individual level. Reference [20] shows that procedural justice climate predicts team identification, independently of the individual perception of procedural justice. These results confirmed the link between organizational justice and identification at the individual level as well as at the team level of analysis. Even a few studies to date show the link between team interpersonal justice climate and team identification at team level, we can assume that:

H1: At the team level, team interpersonal justice climate will be positively related to team identification

B. Team identification and Collective work engagement

Collective work engagement is defined as a state of mind, positive, fulfilling, work-related and shared, characterized by team vigor (willingness of team members to display high levels of energy and mental resilience at work), team dedication (strong involvement at work and feelings of enthusiasm, pride and significance), and team absorption (being fully focused and happily engrossed in work) ([21], [22]).

The group engagement model [23] offers better insight into the potential link between team identification and collective work engagement. According to this model, employees who are strongly identified with their team are willing to be more engaged at work. They have high levels of energy and mental resilience, and will be willing to invest effort and persevere in their work (Vigor). In addition, they will experience a high level of enthusiasm (Dedication) and they will be absorbed in their work (Absorption) [24]. For these reasons, at the team

level, team identification is likely to lead to collective work engagement.

Empirical studies confirm the link between team identification and collective work engagement at individual level. Reference [25] shows that organizational identification has a positive and indirect effect on work engagement while team identification has a positive and direct effect on work engagement. We can therefore assume that:

H2: At the team level, team identification will be positively related to collective work engagement

C. Collective work engagement and Individual innovative behavior

Innovative work behavior refers to the intentional generation and implementation of new ideas at work in order to benefit role performance, group performance or the organisation in general [26].

Job Demands-Resources model [15] offers a better insight into the potential link between collective work engagement and the individual innovative behavior of employees. Job demands refer to "*physical, psychological, social and organizational aspects which require sustained physical and mental effort and are therefore associated with certain physiological and psychological costs*". In addition, job resources refer to "*the physical, psychological, social or organizational aspects of the job that (1) lead to the achievement of job goals, (2) reduce job demands and physiological and psychological costs associates and (3) stimulate learning and the development of personal growth* " [15]. The Job Demands-Resources model proposes that job demands and resources examine two different psychological processes namely a harmful process of depleting available energy due to excessive job demands and a motivational process that encourages engagement to work in the event of excessive job resources [27]. Job resources therefore play a role of extrinsic motivation and contribute to the achievement of work objectives. In addition, they play an intrinsic motivational role since they satisfy basic human needs. This motivational process leads to the collective work engagement, and consequently, to individual innovative behavior. In fact, collectively engaged employees are likely to go beyond the demands and expectations of their role in order to collaborate with their colleagues, make suggestions to improve the organization and seek new innovative ideas since they "liberate" resources through accomplishing their objectives, as well as performing their tasks effectively.

Several studies empirically confirm a potential link between work engagement and innovative behavior at the individual level of analysis. Reference [28] shows that work engagement have a positive and indirect effect on innovation. We can therefore assume that:

H3: Collective work engagement will be positively related to individual innovative behavior

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III.   METHOD

A. Participants and Procedure

The hypotheses were tested with a sample of 220 employees working in four companies operating in two sectors (manufacturing and information technology services) in Tunisia. The four companies that participated in the study showed an innovation orientation, which is reflected in the extent to which innovation-related demands are placed on employee jobs [29]. In the manufacturing and information technology industries, exposure of team members to a continuous demand for innovation in products, procedures and techniques was reported. They were mainly called upon to design and implement engineering products or software tailored to customer's needs.

To implement the study, employees were invited to participate by email from the head of each department. A structured paper questionnaire was given to groups of 15-25 participants at a time during working hours. Participation to the study was voluntary and respondents were assured of the anonymity of their responses. All the filled-out questionnaires were returned in a locked box. Of the 250 responses obtained, 220 responses were usable, which represents a response rate of 88%. The 220 respondents belong to 24 teams. Eighteen teams belonged to information technology services and six belonged to manufacturing industries. Of these 220 participants, 150 (68.18%) were male and 70 (31.81%) were female. Additionally, 20% of respondents were aged between 36 and 45 years. With respect to the education levels, 20.45 % of participants had a graduate degree. Regarding the work year, 16.36% of respondents had worked in their current organizations between 3 and 10 years. Sample Characteristics are summarized in Table I.

TABLE I. SAMPLE CHARACTERISTICS

Characteristics	N=220
Industry	
Manufacturing	180(81.81%)
Information technology services	40(18.18%)
Gender	
Female	70 (31.81%)
Male	150(68.18%)
Age (Years)	
< 25	12 (5.45%)
26-35	100(45.45%)
36-45	44 (20%)
46-55	14(6.36%)
>56	50(22.72%)
Education Level	
Primary school	5 (2.27%)
Secondary school	15(6.81%)
Undergraduate	35(15. 9%)
Graduate	45(20.45%)
Master	70(31.81%)
Other	50(22.72%)
Organizational tenure (years)	
<1	58 (26.36%)
1-3	75(34.09%)
3-10	36(16.36%)
>10	51(23.18%)
Tenure with team (years)	
<1	23(10.45%)
1-3	85(38.63%)
3-10	37(16.81%)
>10	75(34.09%)

B. Measures

Surveys were written in French. Following Brislin's (1980) translation-back-translation procedure, two bilinguals in English and French performed two way translations to ensure equivalency of meaning. All ratings on this questionnaire were on a 5 point scale, 1= strongly disagree to 5= strongly agree.

Team Interpersonal justice: Four items developed by [30] were applied to the team and used to measure team interpersonal justice. A sample item states "My team members treat me with kindness and consideration". Cronbach alpha of this scale equals 0.87.

Team Identification: Five items developed by [31] were used to measure team identification. A sample item included "when someone criticizes my team, I take it as a personal insult". Cronbach alpha equals 0.87.

Collective work engagement: Collective work engagement was assessed using [32] nine items measure. A sample item is "During the task, my team feels full of energy".

Innovative work behavior: Innovative Work Behavior was measured using [33] five items scale. An example of an item is "Within the framework of this work, I am looking for new technologies, processes, techniques or ideas". Cronbach alpha equals to 0.80.

C. Data Analysis

Given the nested nature of our data, we used multilevel structural equation modelling with Mplus [34] to test our hypotheses. The model has two levels: individuals (level 1) and team (level 2). One approach to data processing would be to aggregate all of the individual variables in order to improve a team-level analysis. However, this approach reduces statistical power and does not address all of the available information regarding variance at the individual level [35]. In contrast, multilevel modelling allows us to process information from multiple levels at the same time.

D. Data Aggregation

In order to explain the aggregation of variables at the team level, we calculated the next statistics: rwg(j) index [36], which "compares the observed within-group variability to the expected within-unit variability from a hypothetical distribution, that is to say an expected variance " [37]; ICC(1), which estimates the proportion of variance between participants, can be explained by belonging to a team [38]; and

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ICC (2), which estimates the aggregate scores of these variables [39]. The mean values of rwg (j) were as follows: team interpersonal justice climate, 0.75; team identification, 0.80; and collective work engagement, 0.85. These values are greater than 0.70 indicating good agreement between team members [40]. In addition, the values of ICC (1) were: team interpersonal justice climate, 0.30; team identification, 0.14 and collective work engagement, 0.25. These values are above the recommended level of 0.12 [39]. ICC (2) values were as follows: team interpersonal justice climate, 0.50; team identification, 0.48 and collective work engagement, 0.55. These values are greater than the recommended limit value of 0.47 [41]. Based on these results, we have aggregated all the measures.

IV. RESULTS

Table II presents the descriptive statistics, and the inter-construct correlations between all the variables of our research.

TABLE II. DESCRIPTIVE STATISTICS AND INTER CORRELATIONS BETWEEN VARIABLES

Variables	M	SD	1	2	3	4	5	6	7	8	9
1.Industry											
2.Gender											
3.Education											
4.Organizational tenure											
5.Tenure with team											
Level 2											
6.Team interpersonal justice climate	3.60	.95							.88**		
7.Team identification	3.86	.85								.89**	
8.Collective Work Engagement	3.17	.89									
Level 1											
9.Innovative Work Behavior	3.15	.85								.92**	

Notes: n = 220,*p < .05, **p < .01

In order to assess the fit of the model, a confirmatory factor analysis was performed. We used the following adjustment indices: **RMSEA** which should be less than 0.08 [42] and **CFI** which is recommended to be 0.90 or higher [43]. The results of this analysis demonstrate that our hypothetical model presents a good adaptation to the collected data **(X2 = 400.2, CFI= 0.91, RMSEA = 0.07)**, because all indices were within the recommended field.

TABLE III: ADJUSTMENT INDICES

Model Test	
X2	400.2
RMSEA	0.07
CFI	0.91

Notes: n = 220, Root-Mean-Square Error of Approximation (RMSEA) and Comparative Fit Index (CFI).

Our model includes direct effects of (a) team interpersonal justice climate on team identification at the team level; (b) team identification on collective work engagement at the team level; (c) collective work engagement on individual innovative work behavior (Figure II). Team's interpersonal justice climate is positively linked to team identification at the team level (ρ = 0.88, SE = 0.090, p<0.01) which confirms hypothesis 1. The more employees are treated with respect and dignity within their teams, the more likely they are to develop a sense of shared identity, act as a cohesive unit and derive a collective sense of self-worth. Team Identification is positively linked to collective work engagement at the team level (ρ = 0.89, SE = 0.022, p <0.01) thus confirming hypothesis 2. The more employees are identified with their team, the more they will have high levels of energy and mental resilience, they will be ready to invest effort and persevere in their work, will experience a high level of enthusiasm, and will be absorbed in their work . These employees will therefore be inclined to be more engaged at work. Collective work engagement is also positively linked to individual innovative behavior (ρ = 0.92, SE = 0.12, p <0.01). Given these results, hypothesis 3 is confirmed. The more collectively employees are engaged, the more resources they "free up", the more likely they are to go beyond the demands and expectations of their role to seek out new and innovative ideas.

FIGURE II. RESULTS OF THE MSE FOR THE MEDIATION MODEL
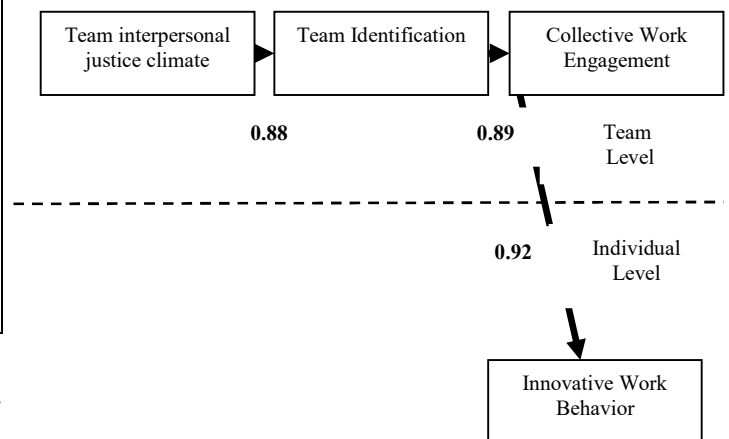
In addition, we observed significant indirect effects of team interpersonal justice climate on individual innovative behavior at work mediated by team identification and collective work engagement (ρ = 0.68, SE = 0.04, p <0.01) (Table IV). Furthermore, the relationship between team interpersonal justice climate and collective work engagement was mediated by team identification at the team level (ρ = 0.76, SE = 0.05, p <0.01).

TABLE IV. INDIRECT EFFECTS

Indirect Effects	ρ	SE	P-Value

Team interpersonal justice climate – Team identification- Collective Work Engagement- Innovative Work Behavior (Niveau 1)	0.68	0.04	p <0.01
Team interpersonal justice climate – Team identification- Collective Work Engagement (Niveau 2)	0.76	0.05	p <0.01

V. CONCLUSION

On the theoretical level, our results make several contributions to organizational justice and innovative behavior research. First, our research offers a new perspective on the effects of justice climate on attitudes and behaviors of employees at work. It expands our knowledge of the effects of collective perceptions of justice at the team level. Second, it shows the role of working groups in justice research. Third, it provides additional empirical validation for the antecedents of individual innovative behaviors at the team level. The latter therefore allows us to better understand how justice climate affects individual innovative behavior. Finally, our research explains the serial mediating role of team identification and collective work engagement in the mechanism that links the justice climate to various outcomes.

On the managerial level, managers should be trained to promote a sense of justice among employees, as this reinforces their innovative behavior. Training programs must go beyond the individual context to take into account the influence of colleagues at work and introduce the notion of justice climate.

Despite the important implications described above, our research has some limitations that might indicate future research. First, our empirical research is limited to employees in Tunisia. Future research should go beyond the current context and re-examine our results in various countries. Second, the data were obtained from a single source at a single measurement time, which may lead to a common method bias [44]. Future research can complement the data obtained by including supervisors as a source of innovative behavior. Third, the transversal nature of the data does not allow for causal relationships between team interpersonal justice climate, team identification, collective work engagement and innovative behavior. Future research should seek to use longitudinal data designed to test cause-and-effect relationships more accurately and track perceptions of justice over time.

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