

Does IT team climate matter? An empirical study of the impact of co-workers and the Confucian work ethic on deviance behavior



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ABSTRACT

This study seeks to determine the impact of IT co-workers on individual deviance behavior in organizations. Using data collected from 322 IT employees and their supervisors in Chinese software companies, we also examine the impact of the Confucian work ethic on deviant behavior. The results suggest that both co-workers' production deviance and the Confucian work ethic have impacts on individuals' production deviance. The influence of IT co-workers' production deviance was greater in high team climates and low team climates than in neutral team climates. The Confucian work ethic has no significant influence on production deviance in low team climates.

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1. Introduction

The prevalent use of teamwork in organizations, especially in the Information Technology (IT) industry, has increased considerably in recent decades due to fierce competition, swift technological changes that have resulted in an increased division of labor, and the need for specialized expertise [22,71,80]. The benefit of teams mainly stems from collective synergy that would be impossible to achieve through individual efforts [42,66,70,76]. While a team is characterized by interdependency, interaction, complementary skills, and mutual accountability among team members [50], the success of software project teams depends on the interaction of knowledge and skills among team members, which is inherently a process that requires intense social interactions. The success of an IT project can be influenced by cultural, individual, socio-economic, and situational factors [15], but only some of these factors can be controlled or at least influenced by IT project managers [6,41]. The IT team climate is one of the most crucial factors [71,53]. Issues associated with the team members as reflected in the team climate can increase the opportunity for IT project deviance behavior, such as team member turnover, a lack of motivation [83], absenteeism, and intention to leave [22]. As such, the IT team climate is vital to the ultimate success of IT projects and therefore represents the objective of this study, which endeavors

to extend the line of deviant workplace behavior research in the IS community.

Deviant workplace behaviors are universal in organizations, with nearly 95% of all companies reporting various forms of deviance-related behaviors. With the inception of the Internet, organizational employees can be unproductive at work in terms of using organizational IT resources for personal computing. This predicament can be amplified given the mushrooming growth of IT implementations in global organizations. In recent years, workplace deviance research has piqued the attention of both researchers and practitioners due to its pervasiveness and the financial costs associated with it [86]. For example, organizations have lost up to \$178 billion annually due to employees' non-work-related computing [82]. In the United States, a loss of \$200 million per year was reported because of deviant workplace behavior [35]. Unauthorized web surfing during working hours has also cost the United Kingdom £300 million in lost productivity per year [77]. Bullying in the workplace costs Australian employers between 6 and 13 billion Australian dollars annually [17].

In essence, the objective of this study is to investigate workplace production deviance in IT settings. Workplace production deviance is generally defined as "the purposeful failure to perform job tasks effectively the way they are supposed to be performed" [73]. More specifically, this definition refers to "behavior that violates formally prescribed organizational norms with respect to minimal quality and quantity of work to be accomplished as part of one's job" [60]. This comprehensive concept sheds light on a dark side of organizational IS settings in

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which deviant employees have a negative impact on the overall productivity of the organization through leaving work earlier or taking excessive or unauthorized breaks [11], increased absenteeism and low job involvement [34], wasting resources, procrastinating, and intentionally working slowly. Compared with deviances of the nature of active sabotage and theft, these trivial and passive production deviances may be less motivated by retaliation but can lead to destructive reactions and an unfavorable work environment. Thus, it is of paramount importance to explore new perspectives and interpret these behaviors in IS research.

Prior studies have primarily focused on the influence of the organization and the supervisor through concepts such as organizational justice, supervisor support, abusive supervision, and human resources system characteristics [57,55,24,72,2,4]. In addition, studies have also found that organizational justice is a key construct in explaining workplace deviance [3,9] such that employees tend to engage in less workplace deviance when they feel they have been treated fairly. In this vein, a plethora of justice-driven factors including distributive justice, procedural justice, interpersonal justice, and informational justice have different impacts on various types of workplace deviance, such as supervisor-directed deviance and organization-directed deviance [2]. The extant literature has suggested that situational variables such as organizational support, which can be perceived by employees as leading to a favorable or unfavorable work environment, also affect deviant workplace behavior [63,24,29]. Furthermore, abusive supervision, which denotes employees' perceptions of what they believe are purposeful and unfair supervisor mistreatment, promotes negative reactions in the workplace [78,79]. While most of the existing studies have investigated the role of organizational variables, progress has also been made at the individual level in understanding the impact of personal traits [23], employee perception of the work situation [44], and individual ethical judgments [49] on workplace deviance. Recent efforts have been made to explore co-workers' influence in interpreting deviant workplace behaviors. For example, Glomb and Liao [33] found that aggressive behavior exhibited by members of a work group is a significant predictor of an individual's interpersonal aggressive behavior. Eder and Eisenberger [24] found that an individual is more likely to withdraw from his or her own work when the employee's co-workers exhibit higher levels of withdrawal. Hung et al. [40] indicated that a revenge motive mediates the relationship between co-worker loafing and workplace deviance. Yang [86] revealed that peers' deviance behavior in a service group can indirectly affect one's behavior toward service customers. However, there still is a paucity of scientific theory-driven investigation on whether the influence of co-workers differs in various situations in the IS domain. This article represents an early attempt to examine the contextual role of the IT team climate in co-workers' influence and to advance our understanding of IT co-workers' role versus workplace norms in deviance behaviors. This study significantly contributes to the IS community by further extending the body of research on the IT team climate vis-à-vis work deviance behavior.

Deviant workplace behavior is one of the consequences of the employee/co-worker exchange relationship. According to Social Exchange Theory, the interactions between parties in an organization represent a state of reciprocal interdependence. Employees expect to gain economic or socio-emotional resources in exchange for their engagement in their job-related roles [67]. The effects of organizational variables depend on a positive norm of reciprocity. When an employee has a positive perception of the work situation, he is less likely to be engaged in workplace deviance [23]. Abusive supervision is more strongly related to supervisor-directed deviance when individuals hold negative reciprocity beliefs [55]. Apparently, negative reciprocity norms explain why mistreated employees may be motivated to retaliate. As Social Exchange

Theory explains, when employees perceive inequity and feel a lack of support from their co-workers, they become more likely to reciprocate toward the source of inequity by threatening their co-workers [47] or engaging in some retaliatory behavior to restore positive feelings [28]. Individuals are guided by some combination of negative reciprocity beliefs in the workplace and other beliefs or motives. For example, Ferris et al. [29] argued that low levels of organizational support frustrated individuals' organization-based self-esteem and increased organizational deviance. Furthermore, an individual's work ethic, or the perceived value and importance of hard work, is another important determinant of work-related behavior. However, little attention has been paid recently to the role of the work ethic in IS research into IT employee workplace deviance. As such, we believe that it is necessary to further explore the role of the work ethic in work deviance behaviors in IT organizations. It is worth noting that, despite the increasing volume of studies in this stream of research, there has been relatively little focus on interpreting employees' deviance behavior, especially in IS research. This study will fill this void and break new ground in IT deviance behavior research.

Departing from prior studies, this work contributes to the academic literature on deviant workplace behavior in IS in several ways. First, we explore the impacts of IT co-workers' production deviance and of the IT team climate on employee production deviance. This perspective expands our understanding of the influence of IT co-workers, especially in the context of Chinese employees. Second, we examine whether the Confucian work ethic influences employee production deviance. This lens supplies a new mechanism to interpret employees' deviance behavior. Finally, we explore the influence of the IT team climate on the Confucian work ethic, which highlights the complexity of the influence of the Confucian work ethic. The study also presents implications and recommendations to help decrease production deviance in organizations.

2. Co-worker and individual production deviance

Workplace deviance has also been termed counterproductive workplace behavior, antisocial organizational behavior, organizational misbehavior, organizational deviance, workplace aggression [5], organizational delinquency [37], and dysfunctional behavior by researchers, who also include varying sets of behaviors in their studies [25]. Among the earlier studies, Hollinger [38] divided deviant work behavior into property and production deviance and recognized distinctions between attacks on organizational processes and attacks on the material resources of the organization, but the author ignored deviant behavior toward other people. In contrast, Robinson and Bennett [64] distinguished between deviant behaviors such as production deviance, property deviance, political deviance, and personal aggression; they specified interpersonal forms of deviance as a new dimension. Researchers have suggested that there are five categories of counterproductive workplace behavior (CWB): abuse against others, production deviance, sabotage, withdrawal and theft [73].

A debate exists about whether exploring radical antecedents helps us to understand deviant workplace behaviors. For example, Ambrose et al. [3] found that injustice was a more frequent cause of sabotage than powerlessness, frustration, facilitation of work, or boredom in organizations. While Spector et al. [73] found that abuse and sabotage were most strongly related to anger and stress, theft was unrelated to emotion, and withdrawal was associated with boredom and being upset; Tepper et al. [79] indicated that abusive supervision was more strongly associated with supervisor-directed deviance than with organization-directed deviance when the intention to quit is higher. Our proposed research model is shown in Fig. 1.

In essence, individual production deviance refers to an organizational employee's behaviors that violate formally prescribed norms and delineate the minimum quality and quantity of work to be accomplished [38]. Along this line, co-worker production deviance refers to an individual employee's co-workers' behaviors that violate formally prescribed organizational norms with respect to the minimum quality and quantity of work to be accomplished as part of their jobs [38]. In general, these behaviors result in reduced efficiency of work output, such as withholding effort for tasks, taking excessive recesses, and intentionally working slowly, among others. As noted by Heise [36], co-workers' behavior is an important reference for an employee's behavior in the workplace. He posited that a person who observes another accepting, supporting, or tolerating an object is likely to do the same, and when observing another rejecting, interfering with, or criticizing an object, the person is also likely to act similarly. In their study of employee citizenship, Bommer et al. [12] found that the mean level of organizational citizenship behavior displayed by other members of one's workgroup explained a significant variance in individual levels of organizational citizenship behavior. Similarly, researchers have also found an influence of aggregate co-worker behavior on individuals' deviant work behavior. For example, Tepper et al. [79] stated that employees' deviant workplace behaviors are related to the frequency with which their co-workers engaged in those behaviors. Eder and Eisenberger [24] found that co-workers' withdrawal behaviors are positively related to an employee's own level of withdrawal behavior. Furthermore, when co-workers display production deviance behaviors, it is unreasonable to deny the influence of co-workers as "important others" on individual production deviance. Recurring incidents of co-workers' deviance behavior constitute a social environment in which an employee is socialized and learns to behave similarly. When an individual communicates with others and also observes their behaviors, the co-workers' production deviance will directly impact the individual's production deviance. Thus, we propose the following hypothesis:

H1. Co-workers' production deviance will be positively related to an individual's production deviance.

3. Confucian work ethic

Defined by the Chinese Cultural Connection [20] and rooted in Confucian values, Confucian work dynamism comprises qualities

such as persistence, personal steadiness, ordered relationships, a sense of shame, and protecting face. It also emphasizes the values of thriftiness and hard work, harmony and cooperation, respect for educational achievements, and reverence for authority [48]. This study focuses on the individual level of the Confucian work ethic (CWE), which stems from Confucian values and is a motivational construct that is reflected in behavior and is related to attitudes and beliefs about work-related activity in general, not specific to any particular job. The CWE emphasizes persistence, patience, endurance, and tolerance of others in the workplace [26,45]. In fact, Confucian work dynamism blends beliefs toward work and individuals in the workplace, while Tsang [81] distinguished between separate attitudes toward work and toward people. Our work sheds light on attitudes and beliefs at the individual level toward general work in the IT industry, and we define the CWE as an individual's view of persistence, patience, hard work, endurance, and work tolerance.

Prior studies have explored the influence of the CWE on employees' attitudes and behaviors at the individual level in disciplines such as Organizational Behavior and Management. For example, Lim [48] found that the CWE was positively associated with individuals' inclination to budget their money. Yeh and Xu [87] focused on the "Hierarchy and Harmony" dimension of the CWE and showed that innovative environments that encouraged the CWE had positive associations with obtaining both general and professional knowledge. Nevertheless, the influence of the CWE on deviant workplace behavior has not been empirically examined and analyzed in IS research.

Individuals who adhere to a high CWE usually have good work habits in any given workplace. Thus, such an individual tends to work hard and patiently, even if the IT-related work is loathsome or boring. He or she will complete a task even when facing a change in the workplace. In sum, individual IT workplace employees who hold a high CWE will not engage in passive behavior in the workplace. Thus, we propose the following hypothesis:

H2. The Confucian work ethic will be negatively related to individual production deviance.

4. Team climate

Teams usually have norms that reflect a set of behaviors that are aligned with their employers' expectations. These norms are formulated either by company policies or by employee practices in the workplace. When frequently interacting with other group

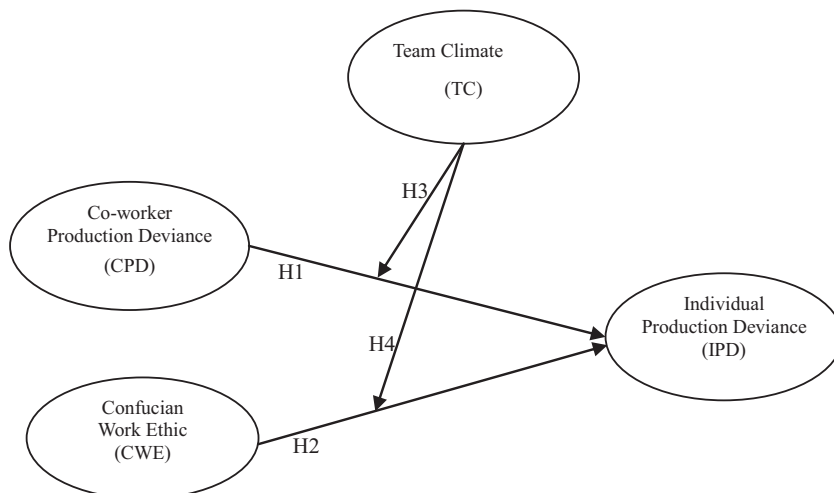


Fig. 1. Research model.

members, an employee is likely to align his personal norms with the team norms [84]. Previous research [69] suggested that the informal norms adopted by individuals usually are derived from others in their direct social contexts. It is conceivable that co-workers exposed to the same organizational policies, leaders, and contextual characteristics are important “others.” In the IS literature, it has been reported that the work team is a particularly important source of social influence that can affect knowledge workers’ perceptions and behaviors [46]. According to Mischel [54], strong situations will have more influence than weak situations on individuals’ behavior. Mischel [54] indicated that desired behaviors are delivered by the underpinning of correct responses. He also posited that normative expectations in strong situations support learning how to perform desired behaviors, whereas weak situations lack these attributes. Team climate, as one type of situation, emphasizes that norms are an informal means of social control without the force of law [21]. This study sheds light on the climate related to employees’ production deviance. Few employees display production deviance, and the normal production behavior is excellent in a high team climate, whereas a low team climate means that more employees display production deviance. In essence, both high and low team climates convey cues and information to individuals and enforce individual learning from others. However, a neutral team climate does not provide clear incentives, support, or normative expectations of behavior. In this situation, individual behavior is mostly guided by idiosyncratic judgment on the appropriateness of the behavior.

In addition, psychological stress plays a vital role in the influence of team climate. In both high and low team climates, individuals endure psychological stress when performing anti-norm behaviors because they perceive the stronger team climate and know that others share the common perception. Other studies have also found that anti-norm behavior in an organization attracted more negative evaluations than did pro-norm behavior [1,13]. In a neutral team climate, however, there is little psychological stress stemming from the team climate regardless of individual production deviance. Compared with those in a neutral team climate, individuals in high and low team climates know the team’s normative expectations, desired behaviors, and negative outcomes when performing anti-norm behavior. As such, psychological stress restrains the role of personal traits and strengthens the traits’ consistency with co-workers’ behavior in high and low team climates. Given the little or no psychological stress perceived in a neutral team climate, individuals will perform behaviors according to their own ideas, which makes it difficult to form normal or deviance behaviors. Thus, we propose the following hypotheses:

H3. As the value of the team climate increases, the positive relationship between co-workers’ production deviance and individual production deviance also increases.

The Confucian value system will influence individual behavior, and the CWE will guide employees’ workplace behavior in Chinese organizations. However, the work ethic influence is not always stable and could be disturbed by other factors in the multidimensional Confucian value system. In high team climates, most co-workers have few, if any, production deviances, thus enhancing individuals’ personal pursuit of Confucian values. Thus, the influence of the Confucian work ethic on production deviance will be strengthened. Low team climates, however, where most co-workers display significant production deviances, restrict individuals’ personal pursuit of Confucian values. Thus, to maintain harmony with co-workers, individuals may restrict their personal pursuit to survive in the workplace. Thus, we propose the following hypothesis:

H4. As the value of the team climate increases, the negative relationship between the Confucian work ethic and individual production deviance also increases.

5. Research method and measurements

5.1. Participants and Procedure

The participants in this study consisted of IT employees and their immediate supervisors in the product development section of small IT enterprises in a metropolitan city in China. Thirty-seven small IT enterprises were randomly selected from a list supplied by the local government-sponsored authority, to which the authors submitted an initial inquiry about small, local IT enterprises. The authoritative list includes all IT-related companies that are operating in a designated software park in the Chinese metropolitan city. The list also provides contact information with which the authors initiated the communications. The particular list was retrieved from <http://www.tianfusoftwarepark.com/en/our-park/our-tenants.html>. Among the 37 randomly selected companies from the list, the team size of the product development sections of the sampled IT enterprises ranged from 6 to 11 employees. Altogether, there were 410 employees and 37 immediate supervisors in these enterprises’ product development sections. All of the employees and their immediate supervisors have a background related to IT-based projects.

Data collection was conducted by using a questionnaire survey developed for the study. The questionnaire that we provided to the employees measured co-worker production deviance, employee production deviance, the Confucian work ethic, and demographics. Questionnaire II, which was provided to the employees’ immediate supervisors, contained measurements of team climate. Because some of the original items were developed in English, they were translated into Chinese by using a standard translation-back-translation procedure to ensure language equivalence [14]. Five-point Likert-type scales were used for all of the items (1 for Almost Never and 5 for Extremely Often or Always). After pretesting and preliminary item analysis, the final versions of the questionnaire were developed and utilized (see Appendix).

With the approval of the enterprise’s supervisors, the authors entered the product development sections and distributed the survey packets, which each included an envelope and Questionnaire I, to every employee in the section. All of the employees were assured of confidentiality and were informed that all of their responses would be used for research purposes only. Then, they were asked to fill out the questionnaire voluntarily. At the same time, survey packets that included an envelope and Questionnaire II were distributed to their immediate supervisors in their own separate offices. The immediate supervisors were asked to fill out Questionnaire II voluntarily. All of the surveys were returned directly to the authors in sealed envelopes.

After discarding surveys with missing data and incomplete questionnaires from the employees’ responses, 322 out of 410 responses were obtained for subsequent data analysis, which yields a 78.5% response rate. Table 1 provides the descriptive statistics of the respondents, including gender, age, education, and work experience.

The respondents consist of 35% females and 65% males. The average age is 27.6 years old, with 133 respondents less than 25 years old, 124 respondents between 26 and 30 years old, 39 respondents between 31 and 35 years old, 21 respondents between 36 and 40 years old, and 5 respondents more than 40 years old. With respect to work experience, the average tenure in the present organization was 3 years, with 145 respondents between 1 and 2 years, 132 respondents between 3 and 4 years, 25 respondents

Table 1
Descriptive statistics for demographics.

Variable	Levels	Respondents
Gender	Male	65%
	Female	35%
Age	<25	41.3% (133)
	26–30	38.5% (124)
	31–35	12.1% (39)
	36–40	6.5% (21)
	>40	1.6% (5)
Education	Master's degree	37.6% (121)
	Bachelor's degree	51.8% (167)
	High school diploma	10.6% (34)
Work experience	1–2	45%
	3–4	40.9%
	5–6	7.8%
	7–8	4%
	>8	2.2%

between 5 and 6 years, 13 respondents between 7 and 8 years, and 7 respondents more than 8 years. For education, the numbers of respondents having a master's degree, a bachelor's degree, or a high school diploma are 121, 167, and 34, respectively. A discussion of the measurement of the constructs is provided in the following section.

5.2. Individual production deviance and co-worker production deviance

The studies by Bennett and Robinson [7] and Stewart et al. [74] adapted five and seven items, respectively, to measure production deviance. In our study, we omitted the item “Came in late to work without permission” because most Chinese enterprises regulate this behavior by punishment or sanctions. Because it is difficult to ascertain whether IT *co-workers* work steadily or spend time daydreaming and to maintain consistency between individual production deviance and co-worker production deviance, these two items were also not included in our scales. In addition, because the Cronbach's alpha values for the items “I left my work for someone else to finish” and “My co-workers left their work for someone else to finish” were less than 0.6 in the pretest, these two items were also excluded from the scale. In the end, three items were used for the measurement of production deviance in our study (see Appendix).

5.3. Confucian work ethic

Rooted in Confucian values, Confucian work dynamism usually includes respect for one's superiors, thriftiness, persistence, a sense of shame, reciprocal courtesy, steadiness, prestige and respect for tradition [85]. Confucian work dynamism also blends employees' beliefs about their general work with those about their relationships in the workplace. To separate out the influence of employees' beliefs about general work, we followed Tsang [81], who ascertained attitudes toward work by Chinese employees. Because the dimension reflects individual values related to general work, this formulation is well-suited for the current study.

5.4. Team climate

Because we hypothesize that team climate is related to employees' production deviance in a group, we adopted the immediate supervisors' assessments of the whole teams' production deviance as the indicator of team climate by using a 5-point Likert scale. By averaging the scores on four items, we classified the respondents into three groups: Climate scores from 1 to 2.33 are high team climates; climate scores from 2.34 to 3.66 are neutral

team climates; and scores from 3.67 to 5 are low team climates. Of the 322 respondents, 169 work within high team climates from 17 product development sections, whereas 96 are in neutral team climates from 11 product development sections, and 57 are in low team climates from 9 product development sections.

5.5. Common method bias

To control common method bias in the data gathering, we used counterbalancing question order, protected respondent anonymity, and reduced evaluation apprehension [59]. In addition, a one-factor Harman test was conducted to assess the possible existence of common method bias. The principal component factor analysis on the questionnaire items showed three factors with eigenvalues greater than 1, accounting for the 58% of the variance. The first factor only explained 31.2% of the variance, which suggests common method bias is not a problem in this study.

5.6. Statistical method

To test the proposed research model, we used structural equations analysis and multi-group analysis. Specifically, we used partial least squares (PLS) through Smart-PLS tools for hypothesis testing based on several considerations. A covariance-based structural equation modeling (CB-SEM) procedure would require a large sample size and normality assumptions on the indicators [19]. With the number of parameters included in this study, a covariance-based structural equation modeling process would require 200 cases using Bentler and Chou's [8] heuristic of 5 cases per parameter estimated. Our sample size in this study is small in the Neutral (96) and Low team climate (57) groups, and the Shapiro–Wilk normality test for our data was significantly different from a normal distribution. In addition, PLS is preferred in causal-predictive analysis and theory development [61]. The framework proposed in this study has never been tested by IS scholars, and the nature of this study is more exploratory than confirmatory. Thus, we deemed it a suitable analysis technique for this research.

6. Data analysis and results

6.1. Testing the model

The assessment of the measurement model comprising co-worker production deviance (CPD), individual production deviance (IPD) and Confucian work ethic (CWE) includes an estimation of internal consistency for reliability and tests of convergent and discriminant validity for construct validity. First, we began by assessing individual item reliability. Individual item reliability is considered to be adequate when the value of its standardized load equals to or is greater than 0.6 [32]. Table 2 reports the results for each item in the three constructs. For each item, we report the results for a high team climate (before the parentheses), a neutral team climate (inside the parentheses), and a low team climate (after the parentheses). As shown in Table 2, all of the factor loadings in the table were greater than 0.6. Thus, they are adopted in the model.

Convergent validity was established by satisfying the following three criteria [32]. First, each item loaded significantly on their respective constructs, and none of the items loaded on their construct below the cutoff value of 0.60 (Table 2). Second, Cronbach's alphas of all of the constructs were over 0.70 [31] (Table 3). Third, the composite reliabilities of all of the constructs were over 0.70 (Table 3). Finally, the average variance extracted (AVEs) of all of the constructs were over the threshold value of 0.50 (Table 3). Discriminant validity was confirmed by ensuring that for

Table 2
Factor analysis item loadings and cross loadings.

	CPD	IPD	CWE
CPD1	0.72** (0.69**)	0.75**	0.42 (0.33) 0.50
CPD2	0.78** (0.86**)	0.85**	0.46 (0.45) 0.54
CPD3	0.67** (0.68**)	0.69**	0.35 (0.27) 0.32
IPD1	0.42 (0.37) 0.54	0.76** (0.75**)	0.86**
IPD2	0.43 (0.40) 0.44	0.77** (0.85**)	0.77**
IPD3	0.46 (0.30) 0.30	0.75** (0.70**)	0.67**
CWE1	0.02 (−0.05) 0.08	−0.17 (−0.17) 0.02	0.85** (0.79**)
CWE2	−0.08 (−0.06) −0.04	−0.05 (−0.25) −0.06	0.76 (0.94**)
CWE3	−0.03 (0.02) 0.09	−0.12 (−0.16) −0.01	0.85* (0.87**)

Note: Data before parentheses describe a High team climate; the data in parentheses describe a Neutral team climate; the data after parentheses describe a Low team climate.

* $p < 0.05$.
** $p < 0.01$.

each construct, the square root of its AVE exceeded all correlations between that factor and any other construct [32] (Table 4). Thus, overall, our measures demonstrated good psychometric properties.

6.2. Testing the structural model

Table 5 shows the standardized PLS path coefficients for our structural model test for all three team climates. The results show that co-worker production deviance is positively related to individual production deviance in all team climates (high, neutral, and low team climates) ($b = 0.65$, $p < 0.001$ in high team climates; $b = 0.44$, $p < 0.001$ in neutral team climates; $b = 0.63$, $p < 0.001$ in low team climates). Thus H1 is supported.

The Confucian work ethic is negatively related to production deviance in high and neutral team climates ($b = 0.19$, $p < 0.05$ in high team climates; $b = 0.22$, $p < 0.05$ in neutral team climates), while the relationship is not significant in low team climates, so H2 is partially supported.

To test the differential impacts of the factors in high, low, and neutral team climates, we adopted the procedure suggested by Hsieh et al. [39]. We first assessed whether the latent constructs function in a similar manner between a high team climate and a neutral team climate. As indicated in Table 2 above, the loading patterns are quite similar, and the factor loadings display no significant differences [16]. Chin [18] noted that when the variances are not too different across groups, a t -test can be applied to assess significant differences in path coefficients for each pair of paths. Therefore, a t -test assuming equal variance was applied to assess the significant differences in the path coefficients for each pair of paths between a high team climate and a neutral team climate. To assess the stability of the results, a Smith–Satterthwaite test with the assumption of unequal variance was also calculated. t -Values greater than 1.96 or less

Table 3
Cronbach's alpha, Fornell's composite reliability and AVE.

	Alpha	Composite reliability	AVE
<i>High team climate</i>			
CPD	0.61	0.79	0.56
IPD	0.65	0.81	0.58
CWE	0.73	0.82	0.61
<i>Neutral team climate</i>			
CPD	0.68	0.82	0.61
IPD	0.67	0.82	0.61
CWE	0.86	0.92	0.80
<i>Low team climate</i>			
CPD	0.66	0.81	0.59
IPD	0.63	0.80	0.57
CWE	0.83	0.88	0.71

Table 4
Description statistics and correlation between constructs. For High ($n = 169$); Neutral ($n = 96$) and Low ($n = 57$) team climates.

	Mean	Std	CPD	IPD	CWE
<i>High team climate</i>					
CPD	2.24	0.51	0.75		
IPD	2.14	0.54	0.61	0.78	
CWE	4.17	0.55	0.02	−0.17	0.77
<i>Neutral team climate</i>					
CPD	2.82	0.61	0.76		
IPD	2.67	0.58	0.45	0.87	
CWE	3.86	0.84	−0.02	−0.22	0.76
<i>Low team climate</i>					
CPD	3.3	0.78	0.77		
IPD	2.92	0.71	0.62	0.84	
CWE	3.91	0.80	0.12	−0.05	0.75

Note: Square root of AVE is listed on the diagonal (Bold).

Table 5
Results of hypothesis testing.

	Coefficient	t -Value
<i>High team climate</i>		
H1: CPD → IPD	0.65	10.18***
H2: CWE → IPD	−0.19	2.13*
<i>Neutral team climate</i>		
H1: CPD → IPD	0.44	6.51***
H2: CWE → IPD	−0.22	2.68*
<i>Low team climate</i>		
H1: CPD → IPD	0.63	7.53***
H2: CWE → IPD	−0.07	0.87

* Significant at 0.05 level of significance.
*** Significant at 0.001 level of significance.

than −1.96 indicate significant differences of path coefficients at the 0.05 level.

Similarly, we assessed whether the latent constructs function in a similar manner between a low team climate and a neutral team climate according to the same procedure. As indicated in Table 2 above, the loading patterns are quite similar, and the factor loadings display no significant differences. It is appropriate to apply the t -test to assess the significant differences between a low team climate and a neutral team climate.

The calculated results (Table 6) suggest that the path coefficients from co-worker production deviance (CPD) to individual production deviance (IPD) are significantly greater for a high team climate than for a neutral team climate ($T_c = 2.21$; $T_{ss} = 2.28$; $p < 0.05$). At the same time, the path coefficients from CPD to IPD are significantly greater for a low team climate than for a neutral team climate ($T_c = 1.74$; $T_{ss} = 1.78$; $p < 0.1$). Thus, H3 is supported. The t -values assessing the influence of a Confucian work ethic ($T_c = 0.19$; $T_{ss} = 0.23$) demonstrate no significant differences between the path coefficients from CWE to IPD in high or neutral team climates. Because the path coefficients from CWE to IPD in low team climates are not significant, we cannot compare the path coefficients in low and neutral climates. Thus, H4 is partially supported.

7. Discussion and conclusions

Production deviance is a prominent phenomenon in IT-related enterprises because it has a profound impact on enterprises' efficiency. Prior research primarily focused on the influence of reciprocity mechanisms between employees and enterprises, thus leaving the mechanisms of the influences of co-workers and the work ethic largely unexplored. To extend this line of research, this study breaks new ground by shedding light on co-workers'

Table 6
Results of hypothesis testing.

High team climate	Tc	Tss
H3: CPD → IPD (high team climate than neutral team climate)	2.21 [*]	2.28 [*]
CPD → IPD (low team climate than neutral team climate)	1.74 ^{**}	1.78 ^{**}
H4: CWE → IPD (high team climate than neutral team climate)	0.19	0.23

^{*} Significant at 0.05 level of significance.

^{**} Significant at 0.1 level of significance.

influence and the influence of an individual's work ethic in IT settings.

The results of the empirical study revealed that co-worker production deviance had a significantly positive influence on employees' individual production deviance regardless of the team climate (i.e., a high, neutral or low team climate). We also found that co-worker influence is not always constant. The influences of co-workers' production deviance in high and low team climates are greater than in a neutral team climate, which suggests that situational and psychological stress can influence employees' production deviance. Specifically, our study found that the Confucian work ethic plays a complex role in employee production deviance. There is no difference between the influence of the CWE in high team climates and neutral team climates, whereas the CWE is minimized in low team climates.

7.1. Theoretical contributions

While retaliation and negative reciprocity norms are the apparent motives for some workplace deviance [2,55,62], the effects of co-worker production deviance shown in this research suggest that co-workers are critical in affecting individual production deviance. At the same time, the Confucian work ethic is a new mechanism that plays a complex role in production deviance and supplies a new lens for our understanding of Chinese employees' production deviance behaviors. This study endeavors to usher the CWE into IS research with regard to deviant workplace behavior in various IT settings. Beyond this individual cultural aspect, this study also provides several significant contributions to academic research.

The first set of theoretical implications focuses on the varying effects of IT co-worker influence in different IT team climates. The results support the hypothesis that IT co-worker production deviance has a significant, positive influence on individual employee production deviance in high, neutral and low team climates. Chinese employees tend to maintain solidarity with others in groups; thus, demonstrating behaviors that are consistent with others in the group is generally viewed as positive and effective by Chinese employees. Therefore, our results are not surprising. Such adaptation is not only a safe psychological choice, but it also signals the intention to maintain harmony with others. Although we observed a general lack of support for the effect of integration rooted in Confucian values, we believe that these findings serve to highlight the core nature of the Confucian work ethic, including a sense of righteousness and virtue and tolerance of others in the workplace.

The influences of IT co-workers' production deviance in high and low team climates are greater than in neutral team climates, which suggests that explicit and consistent team norms indirectly facilitate or restrict employee production deviance. This result is similar to some studies on organizational-level effects [10,24,52]. For example, pertaining to the relationship between the aggregate behaviors of the work group and individual employee behaviors, Mathieu and Kohler [52] showed

that the frequency of absenteeism among work group members is related to individual employee absenteeism. Blau [10] found that the aggregated tardiness of employee work groups is related to the tardiness of individual employees. Similarly, Eder and Eisenberger [24] found that withdrawal behavior by members of work groups was positively related to employees' own levels of withdrawal behavior. These researchers, however, used a group behavior variable that was different from what we used. They either aggregated all of the employees' behaviors or averaged all of the employees' behaviors, excluding the individual employee's own behaviors. In contrast, through supervisor assessment, we define the IT team climate as an objective variable for the employees. In addition, prior work emphasized the direct influence of aggregated behaviors, while this research explores the indirect effect of team climate. From prior research, an individual's perception of group-level deviance directly impacts individual deviant workplace behavior. In our research, IT team climates characterized by employees' production deviance have an obvious impact on the relationship between co-workers' production deviance and individual production deviance. Thus, this study enhances our understanding of the impact of group-level workplace deviance.

The second set of theoretical implications focuses on the effect of the CWE, thus contributing to the rather limited number of studies that have focused on the effect of one's work ethic on deviant workplace behavior. The important conclusion in this study is that the CWE plays a complex role in employee production deviance. Because of the differences between the Confucian and Protestant work ethics, it is valuable to explore the mechanism of the CWE in the context of Chinese employees.

The CWE is similar to the Protestant work ethic inasmuch that hard work is a core value. In exploring the influence of the Protestant work ethic on temporary service employees, Saks et al. [68] argued that individuals who endorsed the Protestant work ethic were more likely to persist at a task and to spend more time engaged in work-related activities. However, individuals who endorsed the Protestant work ethic pursued personal success simply, through hard work and persistence. Chinese employees also expect to obtain their supervisor's acknowledgment [45]. The results of our study partially support the role of the Confucian work ethic in individual production deviance.

We find that the role of the CWE is rather limited in certain team climates. There is no difference between the influence of a Confucian work ethic in high team climate and neutral team climates, which suggests that a high team climate does not enhance the impact of the Confucian work ethic, as we had anticipated. Individual production deviance does decrease in high team climates, but this effect results from co-worker influence rather than the expression of a Confucian work ethic. One possible reason for this result is that a high team climate represents only an ordinary situation, which creates less pressure for individuals to engage in production deviance.

In addition, the Confucian work ethic is minimized in low team climates, which suggests that Chinese employees will choose behavior over belief when facing conflicting situations. According to [30] viewpoint, Asian cultures are characterized by a situation-accepting orientation where people react in a flexible manner. The authors' conclusion was that maintaining consistency with the circumstances was the nature of Chinese social philosophy.

Meanwhile, the results suggest that relativism may be a dominating characteristic in Chinese IT employees. This analysis is consistent with the findings of Peterson [58], who indicated that individual organizational commitment would decrease when individuals who believe in universal moral rules engage in unethical work behavior. This perceived ethical pressure does

not affect the organizational commitment of employees who believe that ethics are relative.

7.2. Implications for practice

This study provides instrumental practical implications for software project team management in organizations. We bring to light the importance of team climate and co-worker influence in affecting individual group member deviance behaviors. Software development is a task that is highly complex and requires a high degree of interdependence among team members [27]. Co-worker deviance behavior can be spread among individual members in group settings [33,65] and during travel to outside stakeholders [56]. It can affect the morale of the immediate community [43] and may lead to low productivity of the whole team. To retain the much-needed talent with the required skillsets and experience to attain a sustainable competitive advantage, organizations and team leaders should be sensitive to deviance behaviors in IT teams. According to Felps and colleagues [28], seeing others act against the legitimate interest of an organization makes those behaviors more mentally accessible and lowers an employee's inhibition about behaving in a similar fashion. Adequate precaution and prevention measures should be taken prior to any increase in employee deviance behavior [4] to reduce the negative effects of deviance behaviors because IT team climate has proven to be quite difficult to modify once it is established [51].

Awareness should also be raised regarding cultural influences in IT teams. A study by Liao et al. [47] showed that when individuals are dissimilar to their work groups in terms of ethnicity, they are less likely to engage in deviance behaviors. With the increased use of offshore, onsite, virtual, globally distributed and self-managed teams in the software industry [75], team leaders, who can anticipate differences in group member national culture or work ethics norms, will be more likely to identify, predict and explain deviant workplace behaviors so that appropriate mechanisms can be installed to reduce the negative consequences of such deviance behaviors within the teams.

8. Limitations and future research

There are some inevitable limitations in this study. First, the research only considered production deviance, not all types of deviant workplace behaviors. Therefore, one must use caution before applying our conclusions more generally to other business segments. In addition, the results are based only on Chinese IT employees, which limits the generalization of the findings to samples from other countries or cultures. Furthermore, we only considered one dimension of the multi-dimensional Confucian values in this research. Whether other factors (e.g., integration, human-heartedness, work-family conflict, and moral discipline) and some IT-specific factors (e.g., trust, self-efficacy, motivation, and innovativeness) have an impact on production deviance should be further investigated. It is hoped that future research may shed further light on other IT areas to scientifically examine the role of deviant workplace behaviors in regard to ethics and IT team climate. Researchers are also recommended to conduct cross-cultural analyses on this phenomenon between Confucian and other competing cultures in IS research.

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Appendix. Survey instrument

A five-point Likert-type scale from 1 (Almost Never) to 5 (Extremely Often or Always) was used for all items.

Individual production deviance

- IPD1 I intentionally worked slower than I could have worked.
- IPD2 I took an additional or a longer break than was acceptable at my workplace.
- IPD3 I worked on a personal matter instead of work for [company name].
- ~~I left my work for someone else to finish.*~~

Co-worker production deviance

- CPD1 My co-workers intentionally worked slower than they could have worked.
- CPD2 My co-workers took an additional or a longer break than was acceptable at their workplace.
- CPD3 My co-workers worked on a personal matter instead of work for [company name].
- ~~My co-workers left their work for someone else to finish.*~~

Confucian work ethic

- CWE1 Work carefully and seriously.
- CWE2 Work persistently and patiently.
- CWE3 Work hard without complaints.

Team climate

- 1 All employees here intentionally worked slower than they could have worked.
- 2 All employees here took an additional or a longer break than was acceptable at their workplace.
- 3 All employees here left their work for someone else to finish.
- 4 All employees here worked on a personal matter instead of work for [company name].

* These items were removed from the survey instrument based on pre-test results.

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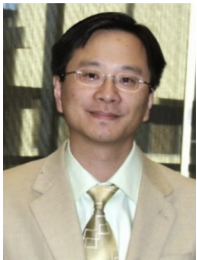
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