A multilevel model of Kahn's job engagement in predicting counterproductive work behaviors: Evidence from financial information technology firms
以Kahn工作敬業的多層次模型預測反生產力工作行為：金融資訊科技公司的實證證據

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Abstract: This research proposes a multilevel model of transformational leadership (TFL), organizational support (OS), organization-based Self-esteem (OSE), and job engagement (JE) to predict counterproductive work behaviors (CWBs). This study tests the proposed model using longitudinal data with 901 employees from 160 different research and development (R&D) workgroups in the financial information technology industry of Greater China at multiple points (Time 1 to Time 3) spanning 10 months. The findings reveal that the individual-level and work-unit-level TLF, OS, and OSE strongly predicts employees' JE, and that individual-level and work-unit-level JE strongly predicts employees' CWBs. The present study proposes a model of JE, but other variables might also be important to JE. These findings suggest that managers not only must inspire and enable employees to apply their full energy to their work (e.g., JE), but must also find ways to alleviate CWBs. The study draws upon Kahn's (1990) engagement theory to explain how TFL, OS, and OSE influence JE, which in turn helps alleviate CWBs.

Keywords: Organizational support, counterproductive work behaviors, job engagement, organization-based self-esteem, transformational leadership.

摘要：本研究提出轉換型領導(TFL)，組織支持(OS)，組織為基礎的自尊(OSE)

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和工作敬業(JE)的多層次模型，以預測反生產力的工作行為(CWB)。本研究使用大中華地區 160 個金融資訊科技產業的不同研發(R&D)工作團體內之 901 名員工的 10 個月縱向資料進行分析(時間 1 至時間 3)。調查結果發現個人層級和工作單位層級的 TLF，OS 和 OSE 良好預測員工的 JE，而個人層級和工作單位層級的 JE 則良好預測員工的 CWB。本研究提出了 JE 的理論模型，但是其它變數可能對 JE 也很重要。這些研究發現指出管理人員不僅必須激勵員工將全部精力投入到工作中(例如 JE)，而且還必須找到減輕 CWB 的方法。該研究借鑒了 Kahn (1990)的敬業理論來解釋 TFL，OS 和 OSE 如何影響 JE，從而有助於緩解 CWB。

關鍵詞：組織支持、反生產力的工作行為、工作敬業、組織為基礎的自尊、轉換型領導

1. Introduction

To effectively compete, contemporary firms should inspire employees to apply their full energy to their job and also alleviate counterproductive work behaviors (CWBs) in the workplace. CWBs are more than trivial notions, because they affect billions of people at work and cost hundreds of billions of dollars in terms of lost productivity, poor performance, and withdrawal (Gatewood *et al.*, 2015; Huang *et al.*, 2017). Thus, there is an urgent need to better understand how organizational climate and individual perception can effectively cope with CWBs, which denote an individual's behavior in response to pressure, as he or she may hurt an organization or colleagues when venting disagreeable emotions (Spector, 1975). Researchers have pushed for further investigations into alleviating CWBs (Cohen-Charash and Mueller, 2007), with intervention strategies for alleviating them branching off into three streams: using individuals' personality (e.g., Zhou *et al.*, 2014), a comparative perspective (e.g., Penney and Spector, 2002), and job attitudes (e.g., Huang *et al.*, 2017) to predict CWBs. To add to this list, our study presents a new category using a multilevel model of Kahn's job engagement (JE) to lessen CWBs.

The concept of JE (Kahn, 1990) has received a great deal of attention in the context of Greater China (e.g., Guan and Frenkel, 2018; Li *et al.*, 2018; Xu *et al.*,

2018), because it not only drives individual performance, but also organizational outcomes (Macey and Schneider, 2008; Kumar *et al.*, 2018; Seppälä *et al.*, 2018). Past scholars have paid much effort to identify the essence of JE (e.g., Jenkins and Delbridge, 2013; Saks, 2006; Viljevac *et al.*, 2012), because of its multiple definitions. In particular, scant studies have examined the mechanism that links leadership (e.g., perceived transformational leadership, TFL), organizational support (e.g., perceived organizational support, OS), and perceived organization-based self-esteem (OSE) to JE. This study draws from Kahn's theory to propose three antecedents of JE: perceived TFL, perceived OS, and perceived OSE. In so doing, this research provides a more comprehensive explanation extending the original concept of JE by Kahn. In common practice, JE is also more than a trivial notion, because practitioners have long been concerned with JE in light of economic factors, such as performance, turnover cost, and competitive advantage (Harter *et al.*, 2002; Kumar *et al.*, 2018; Seppälä *et al.*, 2018).

From Kahn's (1990) work, this study suggests two key concerns that require articulation to fill the gap in the related literature. First, Kahn (1990) stated that individuals with an interpersonal relationship based on trust within a supportive organizational environment (e.g., work-unit-level organization support) demonstrate a willingness to fully engage in work roles (i.e., JE). Kahn (1992) also noted that engaged individuals are open to others and connected to the work context of other people (e.g., work-unit-level contexts). These statements imply that JE at the work-unit level (or organizational environmental context) and the individual level (or employees' perceptions for JE) need to be articulated to support an organizational cross-level perspective of JE (e.g., how work-unit-level variables shape individual-level variables in Kahn's JE theory). Second, Kahn (1990) originally described JE in terms of dynamic moments and called for future research to develop dynamic process models explaining how the antecedent conditions described above combine to produce moments of JE (Kahn, 1990). This statement indicates that a longitudinal study should be employed to articulate the dynamic process of JE. In response to these two concerns, the goal

of this study is to refine Kahn's (1990) theory using a multilevel model with a longitudinal study in order to observe the dynamic processes of the JE model over ten months.

2. Theory and development of hypotheses

2.1 Kahn's job engagement (JE) conceptualization

Kahn (1990) defined JE as "the simultaneous employment and expression of a person's 'preferred self' in task behaviors that promote connections to work and to others, personal presence (physical, cognitive, and emotional), and active, full performances" (Kahn 1990, p. 700). In other words, an individual harnesses his or her full self to actively achieve role performance by investing in physical, cognitive, and emotional resources to focus on his or her own role performances (Kahn, 1990). In short, engagement employees will put their whole hands, head, and heart into their job performance.

2.2 Antecedents of job engagement

Kahn's (1990) theory suggests that three psychological conditions may influence individuals to engage in their role performance (JE), including psychological meaningfulness, psychological safety, and psychological availability. This present study includes an antecedent from each of the three psychological conditions: perceived TFL, perceived OS, and perceived OSE.

Perceived Transformational Leadership. Psychological meaningfulness is the congruence between employee values and organization values. In other words, when the employee realizes that his or her role is congruent with how he or she views himself, then he or she may view his or her role as valuable, which makes him or her more willing to engage in role performance (Kahn, 1992).

Transformational leaders can change the personal values of their followers to be congruent with organizational values (Bono and Judge 2003), thus clarifying the role of TFL. In other words, if an employee believes that his or her values correspond with his or her organization, then he or she may be willing to

engage in role performance (Kahn, 1990; 1992). TFL was introduced by Burns (1978) and Bass (1985) and is employed to guide followers to achieve a better level of thinking. Based on the "management of meaning" (Smircich and Morgan, 1982), a transformational leader can shape the values of his or her followers to meet organizational values. Similarly, previous research also argued that transformational behavior can influence how followers judge their work environment and help followers to see the target or values of the workgroup as congruent with their values (Bono and Judge, 2003).

Although leaderships include many styles, such as transactional leadership, ethical leadership, and participative leadership, past studies have confirmed that TFL can effectively shape employees (Tung, 2019; Weng and Lai, 2012). For example, transactional leadership means that a leader promotes compliance by followers through both punishments and rewards (Bass, 1997). Ethical leadership defines a leader who executes any decision-making according to moral principles (Brown *et al.* 2005). Participative leadership denotes that all members of an organization make decisions together (Kahai *et al.*, 1997). Transactional leadership, ethical leadership, and participative leadership cannot effectively shape the meaningfulness of employees, because these leadership styles have different purposes. However, TFL employs intellectual stimulation, individualized consideration, idealized influence, and inspirational motivation to transform an employee's preferred self-image to fit the expectation of an organization, who then perceives a higher degree of meaningfulness in his or her work and in turn exhibits a high level of engagement. In other words, the transformational process encourages the employee to make a greater investment when chasing organizational targets as a result of an enhanced sense of meaningfulness in his or her work role (Piccolo and Colquitt, 2006). This study proposes the first hypothesis described below.

Hypothesis 1: Perceived TFL positively relates to JE.

Perceived Organizational Support. Psychological safety is defined as feeling able to invest oneself without fear of negative consequences (Kahn, 1990). Although certain variables may be similar to Kahn's (1990) discussion of

psychological safety, such as trust and perceived corporate social responsibility, they do not cover all domains of psychological safety. For example, trust is defined as the willingness to be vulnerable to the actions of another party regardless of whether one can monitor or control the other party (Mayer *et al.*, 1995). Perceived corporate social responsibility means that firms have a moral obligation not only to ensure employees' working life, but also to pay attention to their contributions and well-being along with their work (Cooke and He, 2010).

Perceived OS is similar to Kahn's (1990) discussion and is viewed by Kahn as a driver of psychological safety (1990). An example of OS is that an employee trusts that the organization values employees' contributions and cares about their well-being along with their work (Eisenberger et. al., 1986). When employees perceives their organization as having a high OS, then they have less possibility to worry about encountering injured consequences for their status, self-image, or career in regards to their work role. Conversely, when employees perceives their organization as having a low OS, they are not sure what is expected and worry about bad results. Thus, they may guard themselves by quitting their job (Kahn, 1990). This study proposes the second hypothesis as described below.

Hypothesis 2: Perceived OS positively relates to JE.

Perceived Organization-based Self-esteem. Psychological availability is defined as an individual's belief that he or she is prepared to engage himself (Kahn, 1990). One of the key drivers of availability is an individual's level of confidence, such as status, abilities, and the feeling of self-consciousness associated with an investment of oneself in the performance of his or her duties (Kahn, 1990). Although certain variables, such as self-efficacy (Bandura, 1977) and narcissism (Freud, 1957), may be similar to psychological availability, these variables are in an individual context rather than an organizational context. Moreover, these variables do not cover all domains of psychological availability.

Perceived OSE, as similarly discussed by Kahn (1990), is defined as an evaluation of self-worth and competence in a specific organization (Bergami and Bagozzi, 2000). An individual with a high degree of OSE is self-confident, positive, and well adjusted, and thus he or she believes in his or her efficacy

within an organization (Pierce *et al.*, 1989). Individuals with a high degree of OSE appraise demands positively and demonstrate their ability to handle any type of demands. Thus, they have enough resources to invest in their work role. In this manner, perceived OSE should positively relate to JE. This study proposes the third hypothesis as described below.

Hypothesis 3: Perceived OSE positively relates to JE.

2.3 Transformational leadership, organizational support, organization-based self-esteem, and job engagement at the work-unit level

Although perceived TFL, perceived OS, perceived OSE, and JE have their origin in individual-level analysis, they may form a shared, collective perception of work-unit-level constructs. Accordingly, this study draws these factors into work-unit-level constructs through theoretical perspectives and various studies to offer a basis for their formation as characteristics at the work-unit level.

Previous studies (Albrecht *et al.*, 2018; Kark *et al.*, 2003; Kim et. al., 2015) have examined the notion of TFL, OS, and JE at the work-unit level by aggregating the perceptions of employees at the individual level based on a multilevel organizational method (Kozlowski and Klein, 2000). Although little research has explored OSE at the work-unit level, several studies have touched upon this postulate. For example, both Bergami and Bagozzi (2000) and Kark *et al.* (2003) argued that the construct of OSE is an organization-based property that is specific to individual organizations. The term "organization-based" indicates that such self-esteem may be aggregated into a work-unit-level construct through the use of a multilevel organizational method (Kozlowski and Klein, 2000).

Based on the above discussion, this study suggests that perceived TFL, perceived OS, perceived OSE, and JE at the work-unit level need to be examined in their team context, because these constructs are characterized by the relational context that cannot be seen in terms of independent individuals (Cappelli and Sherer 1991), which is a bottom-up process in a multilevel study (Kozlowski and Klein 2000). This study employs the social information processing theory

(Salancik and Pfeffer, 1978) to offer a basis for yielding perceived TFL, perceived OS, perceived OSE, and JE as work-unit-level properties. An individual gathers information from other individuals in his or her social contexts so as to gain determinations for organizational value. If the individual is a part of a work team (contextual characteristics), then he or she can share similar information and form similar perceptions regarding TFL, OS, OSE, and JE with other team members (Naumann and Bennett, 2000).

2.4 Cross-level effect of transformational leadership, organizational support, and organization-based self-esteem on job engagement

This study argues a multilevel model of JE from three perspectives to link work-unit-level TFL, OS, OSE, and individual-level JE. The first key postulate is the perspective of a contextual model (Firebaugh, 1980), which is defined by an individual who systematically accounts for contextual variables and meaning in human interaction. In other words, perceived TFL, perceived OS, and perceived OSE may form a shared, collective perception of work-unit-level constructs. We further argue that TFL can work both at the individual level and the work-unit level. Individual-level TFL means a TFL perception by an individual employee and can be seen as a type of discretionary stimulus. Work-unit-level TFL means an overall pattern of leadership behaviors displayed to the entire work context and can be viewed as a type of ambient stimulus, which diffuses within a work context and is shared among work-unit members (Hackman, 1992).

The theoretical rationales for the effects of individual-level and work-unit-level TFL vary. Individual-level TFL increases individual-level JE primarily via transforming the psychological meaningfulness of employees, while work-unit-level TFL partially catches individual-level JE by transforming work-unit-level JE. TFL at both the individual level and work-unit level can explain unique variances in individual-level JE. The multilevel context is recommended to study the effect of TFL at various levels of analysis (e.g., Podsakoff & MacKenzie, 1995) and also corresponds to the contextual model (Firebaugh, 1980), which demonstrates individual-level antecedents and their

aggregate in forecasting individual-level behaviors (e.g., Hofmann & Gavin, 1998; Liao and Rupp, 2005; Naumann and Bennett, 2000). In the same vein, individual-level OS and OSE increase individual-level JE primarily through transforming the psychological safety and availability of employees. Moreover, work-unit-level OS and OSE partially catch individual-level JE by changing work-unit-level JE.

The second postulate is the social cognitive theory (SCT) (Bandura, 1986), which argues that human behaviors are seen as an interaction of personal factors and environmental context factors. In other words, an employee's choice of whether to invest his or her physical, cognitive, and emotional energies in JE (e.g., behavior) may be influenced by perceived TFL, perceived OS, perceived OSE (personal perception factors), as well as work-unit-level TFL, OS, and OSE (environmental context factors). Furthermore, these two perspectives are also supported by Kahn's (1990) original perspective of JE, which argues that JE and its three antecedents are rooted in perceptions of self (e.g., at the individual level) and the work context (e.g., at the work-unit level).

Based on the above discussion, this study deems that individual-level JE is influenced not only by perceived TFL, perceived OS, and perceived OSE, but also by work-unit-level TFL, OS, and OSE. For example, Kahn (1990) stated that an individual in a supportive organizational, environmental context (e.g., work-unit-level OS) can increase the intention to fully engage in work roles (e.g., individual-level JE), thus supporting the relationship between work-unit-level OS and individual-level JE at the cross-level perspective. This study now proposes three more hypotheses.

Hypothesis 4: Work-unit-level TFL positively relates to JE.

Hypothesis 5: Work-unit-level OS positively relates to JE.

Hypothesis 6: Work-unit-level OSE positively relates to JE.

For a cross-level inference regarding the connection between work-unit-level JE and individual-level JE, this study employs the social learning theory (Bandura, 1986). Applied to the work team context, the social learning theory (Bandura, 1986) suggests that an individual can learn much of his or her

behaviors by miming other individuals' behaviors. Given these observations and noting which actions are rewarded or punished, the individual can decide whether to do certain behaviors based on the social information gathered. For example, an individual observes his or her co-workers' behaviors that consistently meet the organization's work-unit-level JE, and he or she may pay attention to the subsequent promotion of those co-workers. This individual, if he or she desires promotion, is more likely to act within the work-unit-level JE after paying attention to the promotion of the co-workers who acted in that way. The organization's environmental context (e.g., work-unit-level JE) may influence this engagement (e.g., individual-level JE) and help modify the individual's behaviors, because of the process of role modeling (e.g., Gruys *et al.*, 2008). This study proposes that an individual can learn particular behaviors, such as JE, by miming other members' behaviors among his or her teams to form work-unit-level behaviors (e.g., work-unit-level JE). This study proposes the next hypothesis as described below.

Hypothesis 7: Work-unit-level JE positively relates to individual-level JE.

As mentioned above, this study further proposes that the inference between JE and its antecedents at the individual level (Level 1) could also be duplicated at the work-unit level (Level 2), because work-unit-level TFL, OS, and OSE are the antecedents of work-unit-level JE from Kahn's JE conceptualization. This premise is also consistent with the multilevel model by Chen and Kanfer (2006), in which they proposed that motivational variables at the individual and work-unit level are functionally similar, simultaneously influencing factors at the individual level and work-unit level. This study proposes the next three hypotheses now.

Hypothesis 8: Work-unit-level TFL positively relates to work-unit-level JE.

Hypothesis 9: Work-unit-level OS positively relates to work-unit-level JE.

Hypothesis 10: Work-unit-level OSE positively relates to work-unit-level JE.

2.5 Job engagement and counterproductive work behaviors

Past studies (e.g., Colbert *et al.*, 2004; Dalal, 2005) have confirmed that CWBs and their antecedent can be explained by the norm reciprocity theory and social exchange theory (Gouldner, 1960; Levinson, 1965). For example, when an employee perceives good treatment (e.g., organizational justice, organization support, or job satisfaction) from his or her firm, then he or she will reciprocate with similar behavior toward the firm (e.g., organizational commitment, organizational citizenship behaviors, or high task performance). On the contrary, when an employee perceives poor treatment (e.g., organizational injustice), then he or she may reciprocate with CWBs (Saks, 2006). An employee engages in CWB, because he or she wants to decrease negative emotions and relieve his or her displeasure (Bushman *et al.*, 2001).

A series of job attitudes can cause CWBs, such as low levels of organizational trust, organizational commitment, and discretionary effort (Shepard and Durston, 1988). However, these job attitudes cover the domain of JE. For example, JE covers being physically involved in the organization (e.g., continuance commitment), emotionally connected to work (e.g., affect commitment), being cognitively inspired, and exceeding formal requirements (e.g., discretionary effort) (Macey and Schneider, 2008). This work argues that since high JE is connected with high organizational citizenship behaviors (Macey and Schneider, 2008), and the relationship between organizational citizenship behaviors and counterproductive work behaviors is negative, high JE may be connected with low counterproductive work behaviors. This study also proposes that the inference between JE and CWBs can be duplicated at the work-unit level (Level 2). This study proposes the next two hypotheses.

Hypothesis 11: Perceived JE negatively relates to CWBs.
Hypothesis 12: Work-unit-level JE negatively relates to CWBs.

2.6 The mediating effect of employee engagement

Kessler *et al.* (2013) argued that transformational leadership of leaders can

increase the likelihood of counterproductive work behaviors especially when an employee feels that he or she is treated poorly. Vatankhah *et al.* (2017) also proposed that organizational support can increase the likelihood of counterproductive work behaviors. Whelpley and McDaniel (2016) noted that self-esteem can increase the likelihood of counterproductive work behaviors. Here, our study inherits this argument to offer that transformational leadership, organizational support, and counterproductive work behaviors stimulate employee engagement, which in turn decreases counterproductive work behaviors, because an engaged individual may show more positive and less deviant work behaviors (Bakker *et al.* 2004). Moreover, because an engaged employee is highly dedicated to his or her work, it is reasonable to propose that he or she may decrease behaviors that may damage his or her job (e.g., counterproductive work behaviors). Thus, we arrive at the following hypothesis.

Hypothesis 13: Employee engagement mediates the relationships among transformational leadership, organizational support, organization-based Sself-esteem and counterproductive work behaviors.

3. Methodology

The conceptual model (Figure 1) starts from perceived TFL, perceived OS, and perceived OSE at the individual level and work-unit level based on Kahn's (1990) theory to CWBs.

3.1 Subjects and procedures

This study collected survey data in three points over a ten-month period from financial information technology businesses of Greater China. This study asked supervisors of the financial information technology businesses to recruit voluntary participants in their departments. After this study received the initial responses of employees with the assessment of perceived TFL, perceived OS, and perceived OSE in the first time point, five months later the second survey was conducted of employees who assessed JE. Five months later, the third survey of employees who assessed CWBs was conducted. The use of
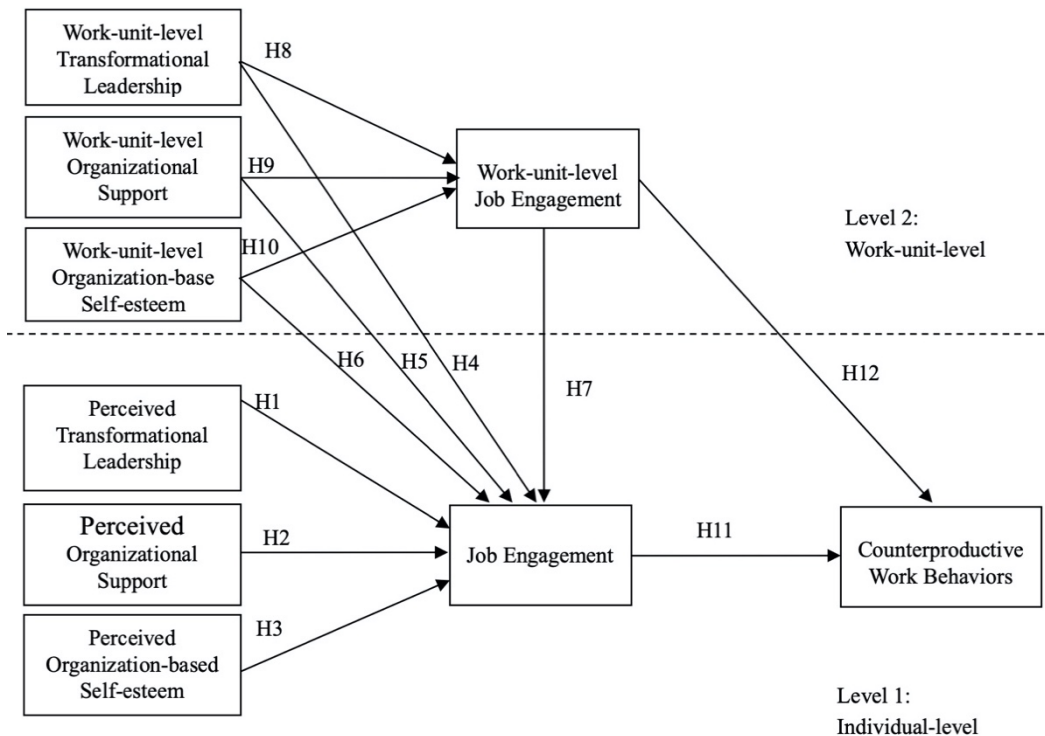
Figure 1
Research model of this study

information obtained from multiple levels can help reduce common method bias (Podsakoff *et al.*, 2003).

This study asked 160 supervisors of the R&D workgroups in the financial information technology firms to recruit at least ten employees in their teams. The sample included 1000 different employees from 160 different R&D teams. The employees were asked to answer questions about their assessment of TFL, OS, and OSE. This study's sample totals 950 employees, representing a response rate of 95%. Five months later, this study examined those 950 employees from 160 different teams who had participated in the initial survey, and this study got 920 samples, representing a response rate of 92%. Ten months later, this study obtained 901 samples, representing a response rate of 90.1%. Non-response bias was handled by the t-test, indicating no significant difference. Of the respondents,

51% are female, 48% are 35 years old, the average job tenure is 1.1 years, and 59% have a college education.

3.2 Measures

We employed the backward translation method to guarantee the translation level (Reynolds *et al.*, 1993) and a seven-point Likert scale to evaluate the items of the five constructs in this work. To measure work-unit-level constructs, this study uses a within-group consensus as an aggregation of individual-level measures (James *et al.*, 1984).

Transformational leadership. A multifactor leadership questionnaire (Bass and Avolio, 1995) was employed to measure transformational leadership. Four items measure intellectual stimulation (e.g.. My supervisor…seeks differing perspectives when solving problems"), inspirational motivation (e.g.. …articulates a compelling vision of the future"), and individualized consideration (e.g.. …treats me as an individual rather than just a member of a group") respectively. Eight items measure idealized influence (e.g.. …instills pride in me for being associated with him/her").

Organizational support. This study employs Eisenberger *et al.*'s (2001) organizational support scale. Items include "The … takes pride in my…". The…really cares about my …". The … values my contributions to its …". The…strongly considers my …". The…shows much concern for..… and "The…is willing to help me if I need …".

Organization-based self-esteem. This study employs Bergami and Bagozzi's (2002) six-item scale.

Job Engagement. Few existing measures of engagement are fully reflected in Kahn's (1990) JE, and hence this study adopts a measure that maps Kahn's conceptualization more precisely. In searching through the literature for existing measures to match Kahn's (1992) study, we take eighteen items to measure JE. The eighteen items include six items of physical engagement revised by Brown and Leigh's (1996) scale to measure work intensity (e.g.. I exert my full effort to my job"), six items of emotional engagement revised by Russell and Barrett's

(1999) scale to measure the core effect (e.g.. I am interested in my job), and six items related to cognitive engagement revised by Rothbard's (2001) scale of engagement (e.g.. At work, my mind is focused on my job).

Counterproductive work behaviors. This study employs 12 items validated by Dalal and his colleague (2009) to measure counterproductive work behaviors. Items include "Behaved unpleasantly toward my…". Tried to harm my…". Criticized my .… opinion or suggestion". Excluded my.… from a conversation". Tried to avoid interacting with my .…". Spoke poorly about my .… to others". Did not work to the best of my ability". Spent time on tasks unrelated to work". Criticized organizational policies". Took an unnecessary break". Worked slower than necessary. and "Spoke poorly about my organization to others".

3.3 Data analysis

This study performs confirmatory factor analysis (CFA) to test scale validity. Because the framework of this study involves cross-level constructs, it applies. multilevel CFA procedures proposed by Dyer and his colleagues (2005) to test the data. Next, this study examines construct relationships and significance using hierarchical linear modeling (HLM) with a random coefficient model (Raudenbush and Bryk 2002).

3.3.1 Validation of multilevel data structure

This study first tests whether the within-group demonstrates adequate consistency to justify aggregation of the perceived TFL, perceived OS, perceived OSE, JE, and CWBs at the individual level into work-unit-level TFL, OS, OSE, and JE. According to one-way analysis of variance, the four variables differ significantly between groups. Intraclass correlation coefficients are above the critical value (i.e., $ICC(1) > 0.2$ and $ICC(2) > 0.7$) for these work-unit-level constructs, which are comparable to aggregate constructs (e.g., the minimal $ICC(1)$ and $ICC(2)$ among the four variables are 0.32 and 0.82, respectively), providing sufficient evidence for between-group reliability as suggested by Bliese (2000). The minimum and mean rwg(j) are respectively 0.82 and 0.91,

Table 1

Means, standard deviations, and correlation of individual-level variables (N=901)

	M	S.D.	TFL	OS	OSE	JE
TFL	3.51	0.88				
OS	3.42	0.82	0.25			
OSE	3.32	0.81	0.23	0.24		
JE	3.50	0.99	0.55	0.51	0.56	
CWBs	3.71	0.88	-0.26	-0.22	-0.28	-0.51

Note: TFL: Transformational leadership; OS: Organizational support; OSE: Organization-based self-esteem; JE: Job engagement; CWBs: Counterproductive Work Behaviors.
* p< .05, ** p< .01.

suggesting adequate within-group consistency (James *et al.*, 1984). These results support the aggregation of perceived TFL, perceived OS, perceived OSE, and JE into a work-unit level.

Second, we perform CFA analysis using Likert-type scales on all of the items corresponding to the five constructs, and the results support the validity. Discriminant validity is also confirmed by the chi-square difference test, and the results also support discriminant validity (please see Table 3). The loadings for work-unit-level constructs are also all statistically significant (e.g., the smallest t-value is 6.82), supporting the validity of work-unit-level constructs. Because JE is a complex construct, it includes three dimensions (work intensity, core effect, and cognitive engagement).

According to the results of factor analysis, each item corresponding to its sub-construct is greater than .7. Thus, this study employs direct averaging for HLM analysis (please see Table 2). Cronbach's alpha values for TFL, OS, OSE, JE, and CWBs are .83, .86, .85, .79, and .82, respectively, as suggested by Cronbach (1951) (please see Table 2). Moreover, RMR (.061), RMSEA (.042), CFI (.92), GFI(.93), and NFI(.91) of the measurement model are all greater than the fit indices as suggested by past studies (Fornell and Larcker, 1981).

Table 2
Standardized loadings and reliabilities

Construct	Indicators	Factor loading	CR	AVE	Cronbach's α
TL	TL1	0.75**	0.81	0.61	0.83
	.				
	.				
	.				
	TL20	0.80**			
OS	OS1	0.81**	0.82	0.64	0.86
	.				
	.				
	.				
	OS6	0.75**			
OSE	OSE1	0.77**	0.83	0.63	0.85
	.				
	.				
	.				
	OSE6	0.90**			
JE	JE1	0.77**	0.79	0.60	0.79
	.				
	.				
	.				
	JE18	0.90**			
CWB	CWB1	0.84**	0.81	0.65	0.82
	.				
	.				
	CWB12	0.89**			

Note: TFL: Transformational leadership; OS: Organizational support; OSE: Organization-based self-esteem; JE: Job engagement; CWBs: Counterproductive Work Behaviors.

3.3.2 Analysis and model development

Because the data of this study are gathered from a structure in which multiple samples are nested within a single team, this study employs HLM as our statistical technique to account for the lack of independence across different teams and structure of cross-level variables (Raudenbush and Bryk 2002) to test the hypotheses. First, this study uses individual-level perceived TFL, perceived OS, perceived OSE, work-unit-level TFL, work-unit-level OS, work-unit-level

Table 3

Chi-square difference tests for examining discriminant validity

	Unconstrained χ^2 =504.44	
Construct pair	Constrained χ^2	χ^2 Difference
(TFL, OS)	614.62	110.18***
(TFL, OSE)	872.86	368.42***
(TFL, JE)	720.45	216.01***
(TFL, CWB)	843.74	339.30***
(OS, OSE)	908.44	404.00***
(OS, JE)	714.29	209.85***
(OS, CWBs)	814.72	310.28***
(OSE, JE)	861.53	357.09***
(OSE, CWBs)	838.75	334.31***
(JE, CWBs)	626.47	122.03***

Note: TFL: Transformational leadership; OS: Organizational support; OSE: Organization-based self-esteem; JE: Job engagement; CWBs: Counterproductive Work Behaviors.

*** Significant at the 0.001 overall significance level by using the Bonferroni method.

OSE, and work-unit-level JE to relate to individual-level JE. Next, work-unit-level TFL, OS, and OSE correlate to work-unit-level JE. Finally, work-unit-level JE and individual-level perceived JE relate to individual-level CWBs.

Cross-level and individual-level results. This study estimates the random intercept and slope model in HLM to assess the cross-level and single-level effects of the individual-level constructs and work-unit-level constructs. The results appear in Model 1 in Table 4. Model 1 explains 43% of the variance in the individual-level JE. The individual-level perceived TFL (γ =0.18, p<0.01), individual-level perceived OS (γ = .16, p< .01), individual-level perceived OSE (γ = .10, p< .01), work-unit-level TFL (γ = .17, p< .01), work-unit-level OS (γ = .15, p< .01), work-unit-level OSE (γ = .09, p< .01), and work-unit-level JE (γ = .61, p< .01) significantly relate to individual-level JE. The results support Hypotheses 1, 2, 3, 4, 5, 6, and 7. These hypotheses state that these antecedents can drive individual-level JE according to the conceptualization of Kahn's engagement. Individual-level perceived JE (γ =0.25, p<0.01) and work-unit-level JE (γ = .32, p< .01) significantly relate to individual-level CWBs. The results support Hypotheses 10 and 11. These Hypotheses state that individual-level

perceived JE and work-unit-level JE can drive individual-level CWBs.

Work-unit-level results. This study estimates a fixed slope model in HLM to test the relationships among constructs at the work-unit-level, because these variables are all at the single level from 160 different observed values. On the basis of these results, work-unit-level TFL (γ = .29, p< .01), work-unit-level OS (γ = .39, p< .01), and work-unit-level OSE (γ = .22, p< .01) significantly relate to work-unit-level JE. These results support Hypotheses 8, 9, and 10.

Baron and Kenny's (1986) three-step method is employed to examine the mediation effect of individual-level variables and work-unit-level variables in this study. The three-step method can open the black box in which the mediator plays an important role between antecedents and outcomes. In step 1, individual-level JE is respectively regressed on individual-level TFL(β = .29, p-value< .01), OS (β = .22, p-value< .01), and OSE (β = .20, p-value < .01), and the results reveal that the coefficient is significant.

In step 2 we regress CWBs (β = .34, p-value < .01) on the individual-level JE. The result reveals that the coefficient is also significant.

In step 3 we regress CWBs on the individual-level TFL, OS, OSE, and JE at the same time. Tesults reveal that the coefficients of individual-level TFL (β = .16, p-value> .05), OS (β = .14, p-value> .05), and OSE (β = .11, p-value> .05) are not significant, but the coefficient of individual-level JE (β = .21, p-value< .05) is significant. The results support the mediating role of individual-level JE among individual-level TFL, OS, OSE, and CWBs.

We also manipulate Baron and Kenny's (1986) three-step method on the relationships among work-unit-level TFL, OS, OSE, JE, and individual-level CWBs. The results support the mediating role of work-unit-level JE. These results also support Hypothesis 12.

Based on the above-supported hypotheses, this study can argue that TFL, OS, OSE at both an individual level and work-unit-level can drive JE according to Kahn's theory. Model 1 in Table 4 explains 43% of the variance in individual-level JE, and the path coefficients are all significant. Model 3 in Table 4 also explains 31% of the variance in individual-level CWBs, and the path

Table 4

Test results of hierarchical regression models

Level and variable	Job engagement (Model 1)		Work-unit-level Job engagement (Model 2)		Counterproductive Work Behaviors (Model 3)	
	γ	*t-ratio*	γ	*t-ratio*	γ	*t-ratio*
Intercept	3.49	41.83			0.25**	4.613
Level 1 variables:						
TFL	0.18**	3.68				
OS	0.16**	5.094				
OSE	0.10**	5.353				
Level 2 variables:						
WTFL	0.17**	3.463	0.29**	5.343		
WOS	0.15**	4.607	0.39**	6.172		
WOSE	0.09**	4.972	0.22**	4.613		
WJE	0.61**	7.56			0.32**	5.691
n (Level 1)	901		901		901	
n (Level 2)	160		160		160	
Model deviance	1797.77		997.12		793.37	
R^2	0.430		0.430		0.310	

Note: TFL: Transformational leadership; OS: Organizational support; OSE: Organization-based self-esteem; JE: Job engagement; WTFL: Work-unit-level transformational leadership; WOS: Work-unit-level organizational support; CWBs: Counterproductive work behaviors.
WOSE: Work-unit-level organization-based self-esteem; WJE: Work-unit-level job engagement.
* $p < .05$, ** $p < .01$.

coefficients are all significant. These figures support the ability of the multilevel framework to predict JE and CWBs.

4. Discussion

This research provides a model of how Kahn's engagement theory can be practiced in an organizational multilevel framework of JE. This multilevel model is important in organizational research and provides an adequate explanation for predicting employees' behaviors.

4.1 Academic contribution

Integrating the JE theory with its antecedents, the present study examines the impact of JE theory on CWBs. First, our primary theoretical contribution is to extend Kahn's theory of engagement by including the antecedents and the outcome of JE from an organizational cross-level perspective. This study also provides a proper articulation of JE in terms of psychological meaningfulness, psychological safety, and psychological availability at an individual level and work-unit level. This study employs Kahn's theory to detect the three antecedents of JE that this study includes in the JE model: TFL, OS, and OSE.

Second, Kahn (1990) described "engagement in terms of dynamic moments, ebbs and flows, and "calibrations of self-in-role" (1990, p. 694) and distinguished JE from other variables (e.g., involvement and commitment). He also named JE as a person's psychological presence in particular moments that can fluctuate over time and pushed for a study to develop a dynamic process model of JE with its antecedents. The longitudinal data of this study respond to this call through actual observations of organizations' dynamic processes over a five-month period.

Some methodological developments confirm our confidence in the results of the present study. First, obtaining data with lag times may reduce common method bias (Podsakoff *et al.*, 2003). Second, employing the HLM technique to capture the environmental context can help to fully understand the mechanism of how JE mitigates CWBs. Finally, the results of an empirical study based on a sample from Asia are similar to the JE theory that was examined in a Western sample, thus contributing to the literature by confirming the theory's validity in a

non-Western setting.

4.2 Practical contribution

Past studies found that CWBs have caused losses of US$200 billion per year to U.S. businesses (Murphy, 1993). Employee theft further has caused losses of US$400 billion to US$2 trillion dollars (Buss, 1993; Camara and Schneider, 1994; Snyder and Blair, 1989), which 10 to 50 times more than that of U.S. street crime. If the costs of employee absenteeism, separation, unintentional work, and leakage are included in firm losses, then the total amount is very difficult to estimate (Filipczak, 1993; Hannah, 2015; Kurland, 1993; Slora, 1991). Harper (1999) indicated that 33% to 75% of corporate employees admit that they have exhibited CWBs such as theft, computer destruction, theft of public property, violence, slacking, and absenteeism in the workplace. There are also some well-known cases of CWBs recently in Taiwan. An employee of Youbike implanted viruses into the system to cause crashes, because of dissatisfaction with his supervisor's admonishments (Liao, 2016). Many technology leaks by Taiwanese engineers have also received attention in the media (e.g., CNA, 2019; Pan, 2013). Based on our theoretical model and analysis results, we provide two management approaches for managers to mitigate the problems of CWBs.

First, human resources managers generally put forth a lot of resources in recruiting people who meet a job's requirements and have potential capabilities for high performance. However, they seldom consider possible situational variables (e.g., JE) for alleviating CWBs after these people are hired. The findings herein reveal a significant effect of JE on CWBs, suggesting that TFL, OS, and OSE make up an effective management mechanism to increase JE, which in turn reduces the risk of CWBs - that is, these situational variables indeed help minimize CWBs, and managers should learn how to optimize them to further build a good working atmosphere. one concrete way is to hold a staff meeting to express a firm's vision and values and for workers to communicate with each other.

Second, human resource practices should be modified to help choose

employees with high OSE, because high OSE can increase JE. A manager also should increase the firm's OS in order to foster the perceptions of employees' JE. Moreover, this study suggests that managers' TFL can be fostered through corporate training courses so as to improve followers' JE.

4.3 Limitations and further research

First, although this study has examined JE, which is rooted in the literature and emphasizes relationships with antecedent conditions, further studies can pay attention to how JE fits in with other motivational theories (Kanfer, 1990). For example, JE is defined as the degree to which an individual chooses to invest his or her self into role-related activities, and so studies can explore the implications of JE among existing cognitive choice theories. This study suggests three antecedents of JE, however, other antecedents of JE that Kahn (1990, 1992) did not address need to be investigated - that is, future studies can test a series of antecedents related to JE in different contexts. Although this study believes that employees rate their own perceptions of psychological construction as being better, employees can still fill in the answers based on their feelings in the company (Crampton and Wagner, 1994). Follow-up scholarly research can thus be conducted from different sources, such as supervisors' or peers' evaluations, so as to mitigate the common method bias (Podsakoff *et al.*, 2003). Except for the proper correction of the scale of JE, all the constructs are adopted from the well-established scales of Western research, and so internal consistency in regards to reliability is appropriate. However, as this study does adopts the scale of Western research, it may be limited to the cultural context in which the sample is located (Asia). Hence, subsequent research can further develop a scale based on Asian culture and verify its consistency under the framework proposed in this study.

Second, past CWB literature is mostly divided into negative behaviors for organizations, supervisors, and colleagues. According to Callan *et al.* (2014), lower self-esteem may cause more self-defeating behaviors, and so future scholars can include the CWB concept or scale with self-esteem to detect this

assumption. Because this study adopts an overall CWB scale regardless of the overall industry, the conclusions drawn herein may vary due to different industries. For example, one of the major downfalls of academic research on an organization is falsified data that cannot detected in the CWB scale of this study. We suggest that subsequent researchers delve deeper into other industries to help develop various specific scales (Bowling and Gruys, 2010).

Third, the empirical data of this study are restricted to financial information technology businesses in Greater China. However, Calder and his colleagues (1981) proposed that a specific sample can be allowed, if the objective is to test a theory rather than to generalize empirical results.

Finally, the present study extends the growing but still limited body of CWB research (Fox *et al.*, 2001). Past studies generally employed personalities, comparative perspectives, and job attitudes to predict CWBs. The present study not only conceptualizes the JE theory, but also presents a new category using a multilevel model of JE theory to help alleviate CWBs. Although personal variables (e.g., personality) are good criteria to reduce the risk of counterproductive work behaviors (e.g., Bowling and Lyons, 2015; Penney and Spector, 2002; Salgado, 2002), there may be some restrictions on these variables. One restriction is that personal variables help select employees with low risks of counterproductive work behaviors before they are hired, but they may not handle the problem entirely. The present study provides a new way to reduce the risk of counterproductive work behaviors from the perspective of human (e.g., individual-level perception) and environment (e.g., work-unit-level contexts) interaction based on the JE theory so as to guide the direction of further research.

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