Received: 22 April 2020 | Revised: 18 May 2021 | Accepted: 13 July 2021

DOI: 10.1111/caim.12462

REGULAR ARTICLE

WILEY

Innovative work behavior in Singapore evoked by transformational leaders through innovation support and readiness

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The current global economic landscape is forcing all organizational sectors to remain relevant by innovating services, products and work processes. Therefore, more than before, organizational leaders must enable innovative behaviour of their employees. Although the literature shows that transformational leadership induces innovative employee behaviour, the mediating mechanisms between Asian organizational leaders and their followers have rarely been empirically examined. We conducted a survey study among 406 employees from six public and private sector service organizations in Singapore to test two mediating effects between transformational leadership and employee innovative work behaviour. The results supported the hypothesized three-path mediation model, with perceived support for innovation and innovation readiness as mediators in a series. These findings can be used to design and implement effective human resource and organizational development interventions within Asian service organizations. Our study also extends the literature on the effects of transformational leadership in collectivistic cultures.

KEYWORDS
collectivistic culture, employee innovative work behaviour, innovation readiness, perceived support for innovation, transformational leadership

1 | INTRODUCTION

Innovation is of great concern among business leaders. Managers around the globe who are tasked with enabling innovative work behaviours (IWBs) among their followers typically face various challenges. First, there is no guarantee that the innovation-inducing behaviours from one culture will work in another (Wan et al., 2005; Watts et al., 2020). Second, the work environment to support employees' IWBs varies greatly (Gumusluoglu & Ilsev, 2009; Sarros et al., 2008). Third, employees' innovative behaviours are known to depend in part on their perceived need, willingness and ability to innovate, that is, readiness for innovation (M. Choi & Ruona, 2011; Holt et al., 2007; Holt & Daspit, 2015; Holt & Vardaman, 2013; Peng et al., 2020; Rafferty et al., 2013). Yet innovative employees can sometimes be seen as rocking the boat (taking risk): their ideas can upset other organizational actors, because they disrupt existing routines, thereby causing insecurity and resistance within organizations (Cheng & Hong, 2017; Janssen et al., 2004). Following on from the above, we chose one particular leadership theory as a guide to examine what management behaviours can meet the challenges and how can these behaviours affect followers' IWB.

Previous evidence suggests that the transformational leadership style is positively associated with follower IWB and the outcomes: both at the individual and organizational level (Avolio & Bass, 1995;

Bin Saeed et al., 2019; D.D. Jung et al., 2008; Lukes & Stephan, 2017; Ng, 2017; Steele et al., 2018; Watts et al., 2020). Some scholars have proposed, therefore, that transformational leaderhip (TFL) is universally beneficial (e.g., Bass, 1997; Gumusluoglu & Ilsev, 2009). However, in Asian countries such as Singapore, where risk-taking is not a cultural norm, leaders are less likely to make or support risky decisions in their organizations (Cheng & Hong, 2017; Dorfman et al., 2012). As noted by Bhaskaran (2018) and Mahbubani (2016), Singaporean leaders' aversion to risk and change is potentially one of the biggest challenges to Singapore's economic future. Theoretically, cross-cultural studies noted that the link between leader behaviour and high follower performance has not been investigated thoroughly in up-and-coming, non-Western countries (e.g., Den Hartog et al., 1999; Dorfman et al., 2012). Indeed, some research has shown that TFL affects innovative behaviour within collectivist cultures differently than in individualistic work cultures (D.I. Jung et al., 1995; Mittal, 2015). There is thus a clear need to understand better the effects of Asian transformational leaders on their followers' IWBs, together with the variables that may mediate this relationship.

Many Asian countries are characterized by high collectivism, high power distance and low uncertainty avoidance (Taras et al., 2012). In such countries, work centrality, with a high level of group orientation and high respect for authority, is likely to enhance transformational leadership processes (D.I. Jung et al., 1995; Mittal, 2015). Consequently, if Asian leaders can create a supportive environment that ensures followers' perceptions that change is needed and possible, then innovative behaviours are more likely to occur. Although Steele et al. (2018) and Watts et al. (2020) concluded that transformational supervisors can support employee innovation across cultures, the motivational mechanisms that transformational leaders should exert to influence their followers' innovative behaviours has not been adequately addressed yet in Asian contexts (Janssen et al., 2004; Lukes & Stephan, 2017; Scott & Bruce, 1994; Siangchokyoo et al., 2020). Hence, *how* TFL influences employee's IWB in a collectivistic Asian context is the focus of the current study. Because employee behaviour is the outcome of a complex interaction of individual, situational, organizational and macro-cultural factors (e.g., Woodman & Schoenfeldt, 1990), our field study integrates two follower-type factors that are hypothesized to mediate between Asian transformational leadership and employee IWB: followers' perceived support for innovation and their degree of innovation readiness (Afsar & Masood, 2018; S.B. Choi et al., 2016). The present study examines if transformational leaders in Singapore indeed wield their influence through both follower factors, so that more IWB occurs among the employees they directly supervise. The key research question of this field study is therefore as follows: *Can follower perceived support for innovation and innovation readiness mediate the relationship between transformational leadership and innovative work behaviour among Singaporean employees?*

Our hypotheses were tested with survey data from public- and private-sector service employees in Singapore, thereby extending the flow of innovation and leadership research from the Western to the Eastern hemisphere. In the following sections, we will first elaborate on the theory underpinning four specific hypotheses; for this purpose, we invoke the transformational leadership theory in relation to a collectivistic culture (D.I. Jung et al., 1995; Mittal, 2015) and combine it with previous research that fits an individual-level extension of the organizational readiness to change theory (Weiner, 2009). After Section 3, we present and discuss the findings of our analyses, leading to theoretical and practical implications and suggestions for further research.

2 | THEORY

2.1 | Transformational leadership and employee IWB

IWB is defined as the intentional introduction of new ideas to help solve recognized problems. This behaviour is known to occur through generating, championing and implementing ideas to enhance personal and/or business performance (Kanter, 1988; Scott & Bruce, 1994; Shanker et al., 2017). Previous research shows that transformational leaders can increase employees' level of innovation (Bednall et al., 2018; S.B. Choi et al., 2016; Nederveen-Pieterse et al., 2010). In doing so, they enact four key behaviours towards their followers (Bass & Avolio, 1994): idealized influence (e.g., charismatic role modelling), inspirational motivation (e.g., articulating an evocative organizational vision), intellectual stimulation (e.g., promoting creativity and innovation) and individualized consideration (e.g., coaching and mentoring). As put forward by Shamir et al. (1993), these four transformational leader behaviours are thought to affect followers' self-concepts. Followers internalize leaders' charismatic and visionary values and beliefs, because of followers' desire to identify with their leader (House et al., 2004). As such, the four prototypical transformational leader behaviours tend to reshape or transform followers' norms and values towards promoting higher levels of job performance (D.D. Jung et al., 2008; Siangchokyoo et al., 2020).

Several scholars have argued that TFL works even better when followers' cultural orientation is collectivistic (e.g., D.I. Jung et al., 1995; Mittal, 2015). This is because, in a collectivist culture, there is more emphasis on group goals and followers may be more likely to put in extra or different efforts for the sake of their group and/or organization (D.D. Jung et al., 2008). In a collectivist culture, a follower's motivational state is expected to shift easily from self-interest to collective interest, that is, experiencing individual success through group accomplishments (D.D. Jung et al., 2008; Shamir et al., 1993). TFL shows followers the importance of transcending their self-interest for the sake of collective shared interests, like the long-term survival of their organization through innovative work efforts (Avolio et al., 2004).

More generally, a high level of TFL behaviour stimulates employees' intellectual power to create an organization free from uncooperative criticism, mistakes and grievances (Bass & Riggio, 2006), through an explicit focus on effective collaboration to develop new or more productive ways of working (Zheng et al., 2016), and so attain

exciting shared goals (Kark et al., 2003). As such, TFL fosters followers' skills to explore or generate alternative constructive viewpoints, thereby stimulating IWB (Bin Saeed et al., 2019; D.D. Jung et al., 2008; Qu et al., 2015; Watts et al., 2017). Moreover, transformational leaders are usually relatively fair leaders (Cho & Dansereau, 2010), and rewarding employees fairly will motivate them more to respond innovatively to the work demands (Prieto & Pérez-Santana, 2014).

Despite the assumed impact of TFL on followers' high innovativeness, few empirical studies have investigated or shown the effect of TFL on IWB in a collectivistic or tight macro-level culture (D.I. Jung et al., 1995). The exceptions are studies of nurses in public sector hospitals in Pakistan (Afsar & Masood, 2018), hospital employees in Singapore (Avolio et al., 2004) and other workers in South Korea (S.B. Choi et al., 2016). Consistent with the theoretical arguments about TFL, these studies show that TFL behaviours significantly promote IWB among followers. To add to this small but practically increasingly relevant body of literature, the current study first examines the presumed baseline effect of TFL on IWB among Singaporean employees:

> **Hypothesis 1.** Transformational leadership is positively related to employee innovative work behaviour.

2.2 | Perceived support for innovation as a mediator

Leaders can support innovation by encouraging, recognizing and rewarding creativity through resources like personnel, funding and time (Denti & Hemlin, 2012; Scott & Bruce, 1994). In addition, according to Amabile et al. (1996), employees can be innovative when they feel they are supported to think outside the box. Similarly, Scott and Bruce (1994) state in their seminal work that employees' perception of the extent to which innovation is supported at work is likely to moderate the relationship between TFL and IWB: this includes a perception of their involvement in the decision-making and the level of organizational resources allocated to innovation. Hence, when employees perceive their department as 'open to change' and have adequate resources, they are more likely to respond favourably to their leader's innovation stimulation by taking more risks and championing innovation (Scott & Bruce, 1994).

In collectivistic cultures, where followers are more anchored on their leader's role modelling (Engelen et al., 2014), followers' perceived support for innovation is strongly influenced by leader behaviours. This is very important because IWB is seldom a critical component of employees' job descriptions, or an organization's reward system (Janssen, 2000), possibly because they often require discretionary extra-role behaviours (Cheng & Hong, 2017; Coetzer et al., 2018). Thus, unless transformational leaders actively support them through intellectual stimulation and the three other types of transformational behaviours, the employees may not engage in it voluntarily (Bass & Riggio, 2006). Transformational leaders do recognize differences between employees and, on that basis, adopt individualized consideration to tailor their support for innovative follower behaviour (Bass, 1985; Bass & Riggio, 2006; Rosing, 2017). Also, on applying idealized influence and inspirational motivation, transformational leaders prompt their followers to free up resources for innovation (Khalili, 2016). Altogether, the four TFL behaviours can create a sense of support for innovation among employees, which in turn encourages them to engage in IWB for the benefit of their team and/or organization (Janssen, 2000).

Thus, instead of a moderating role, we argue here for a *mediating* role of perceived support for innovation in the relationship between TFL and follower IWB. Especially in Asian cultures, being challenged by their leaders without collective support from them would complicate followers' productive participation in IWB (Fernet et al., 2015; Zuraik & Kelly, 2019). Other scholars have also argued for a mediating role of support for innovation: Paulsen et al. (2013) showed, for instance, that TFL creates a supportive work environment for innovation. Accordingly, Prieto and Pérez-Santana (2014) reported that employees' perception of support mediates the relationship between human resource practices that enhance employee confidence and the will to engage in IWB. Therefore, we examined the mediating role of perceived support for innovation in the relationship between transformational leadership and IWB which is deemed to exist especially in Asian contexts, leading to the second hypothesis:

> **Hypothesis 2.** Perceived support for innovation mediates the relationship between transformational leadership and employee innovative work behaviour.

2.3 | Individual innovation readiness as mediator

According to Krause and Anderson (2014), an employee's propensity to innovate is significantly enhanced by intrinsic motivation and knowledge of the need for change. Employees' motivation is, in turn, influenced by their ability to change and their beliefs that the results of their extra effort will be viewed positively (Eby et al., 2000; Jones et al., 2005; Rafferty et al., 2013). Hence, individuals are not passive recipients of change stimulation and support for it (Katsaros et al., 2020; Oreg et al., 2018). They assess and react to what is happening in their work environment. Such judgements about one's own abilities to act innovatively in a particular setting (i.e., change efficacy) are related to the amount of effort individuals are willing to put into achieving the set goals (Bandura, 1982). When employees feel success is out of reach, they are unlikely to put in much energy (Eby et al., 2000). Hence, employee innovation readiness requires both the ability and the willingness to innovate. This is in accordance with Weiner's (2009) theory of organizational-level readiness to change, which can be translated to the individual level. Weiner's widely cited theory purports that contextual factors, such as those related to the leadership and organizational culture, contribute to people's change efficacy as well as to their commitment to change. Similar findings arose from the Rogers (2010) and M. Choi and Ruona (2011) studies

which mirror the colloquial use of the term 'readiness', meaning being able and willing to change (Holt & Daspit, 2015).

Prior research on *individual-level innovation readiness* is limited: our literature search showed that innovation readiness is related to product, service and open innovation.[1] The few available studies defined individual innovation readiness as 'organizational members' beliefs, attitudes, and intentions regarding the extent to which innovations are needed and the organization's capacity to successfully make those innovation changes' (Chen et al., 2014, p. 160). The present study does not focus on an organization's ability but on an *individual*'s ability to come up with or successfully implement innovations. Individual innovation readiness can then be defined as an individual's belief about the need for change, ability to make the change and confidence in its benefit to both the organization and its employees (M. Choi & Ruona, 2011; Holt et al., 2007; Holt & Vardaman, 2013). According to Rafferty and Simons (2006), employees will contribute to change if they believe that their work situation needs innovative change and is likely to improve as a result of their efforts.

To help employees reach this state, the four types of transformational leader behaviours are expected to elicit high employee innovation readiness. First, by clearly communicating the vision of an innovative organization through inspirational motivation, transformational leaders stir the need for innovative change among their followers, which will help them understand its importance (Holt & Vardaman, 2013). Second, by asking for individual input and stimulating their intellect, transformational leaders are good at raising employee's belief that they have the capacity and ability to implement innovative change. Thus, they boost individual self-efficacy, enhance perceptions of control and thereby enhance an employee's readiness to perform an innovative task (Afsar & Masood, 2018; M. Choi & Ruona, 2011; Zheng et al., 2016). Third, through idealized influence, transformational leaders serve as charismatic role models that question and challenge existing procedures (Podsakoff et al., 1990). This behaviour leads employees to learn from their leader's example and stimulate their own perceived desire to innovate. Finally, employees who are exposed to TFL receive individualized attention and support for their personal growth (Zuraik & Kelly, 2019). This aspect strengthens employees' confidence that they are able to develop and implement innovations. Thus, we expect the following:

> **Hypothesis 3.** Individual employee innovation readiness mediates the relationship between transformational leadership and employee innovative work behaviour.

2.4 | Perceived support for innovation and innovation readiness as serial mediators

In addition to learning the change-oriented values and behaviours of their transformational leader, employees can increase their willingness, and thus readiness, to innovate when they see support for innovation within their immediate work context (Afsar & Masood, 2018; Chen et al., 2014). When forward-looking change or innovation is supported or becomes a normality, it is likely that employees' perceptions of support for innovation will be positively associated with their own openness to change (M. Choi & Ruona, 2011) or readiness to change or innovate (Holt & Daspit, 2015). In turn, employees will then be more inclined to be involved in (ongoing) innovations (Armenakis et al., 1993), especially when they receive, clear, timely and accurate information and have the opportunity to participate (M. Choi & Ruona, 2011; Rafferty & Simons, 2006). Thus,

> **Hypothesis 4.** Individual employee innovation readiness mediates the relationship between perceived support for innovation and innovative work behaviour.

3 | METHODS

3.1 | Singapore context

The study's hypothetical model (Figure 1) was tested with data from managers and employees in six private and public service organizations in Singapore. In the world economy, the service sector is considered the largest and fastest growing sector, accounting for the largest share in total output and employment in the most developed countries (Hsu et al., 2019). Given Singapore's lack of natural resources, the country's service sector contributes 70% of the GDP (Department of Statistics Singapore, 2019). To remain competitive as a country, Singaporean organizations and their employees are pressured to remain relevant by introducing new services and solutions (Goh, 2016; Subhani, 2020). Innovation thus plays an increasingly important role in the country's future growth. Furthermore, Singapore's ethnic majority consists of Chinese who are strongly influenced by Confucian philosophy that emphasizes mutual and complimentary obligations (D.I. Jung et al., 1995). These features make Singapore a well-fitting context for an empirical study into the impact of leaders on employee innovation in an Asian setting.

3.2 | Samples and procedures

We first pilot tested a survey among 48 employees of a public educational institute in Singapore (97.96% response rate). Following factor and reliability analyses and feedback from participants, we made some adjustments to the instrument. From August to December 2017, we surveyed 679 employees from six service organizations in Singapore employing between 60 to 1,800 individuals; participation was voluntary. The mean response rate was 70.97% but 76 were incomplete and thus omitted, resulting in a sample of 406 participants.

The mean sample characteristics were $M_{age} = 35.57$ years; 55.6% women; $M_{tenure} = 3.39$ years and $M_{role\_tenure} = 3.78$ years; 69.8% had

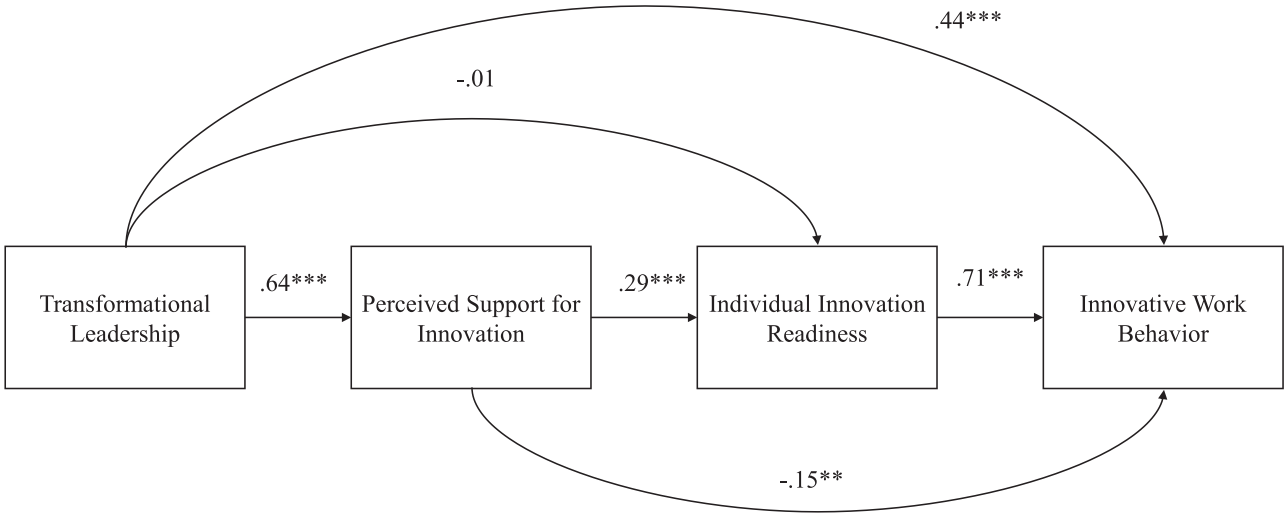

FIGURE 1 Three-path mediation model tested with multilevel analyses. Note: presented are standardized estimates controlled for gender, age, marker variable and the organization-level main variables, which are omitted for clarity purposes. $^{**}p < .01$; $^{***}p < .001$

TABLE 1 Characteristics of the participating organizations

Org.	Sector/industry	Basic activity	Total no. of staff	Organizational culture values
1	Private sector: Consultancy	Branding, public relations and communications	60	Original, accountability and professionalism
2	Public sector: Government institute	Digital infrastructure	850	Think big, start small and learn innovation is the way of life in this organization. Quickly from failing.
3	Public sector: Government institute	Tax and revenue administration	900	Fairness, professionalism, integrity, teamwork and innovation
4	Public sector: Education	Higher education in design and technology	750	Leadership, integrity, passion, collaboration and creativity
5	Private sector: Transportation	Locally-owned third-party logistics	530	Knowledge-driven solutions, integrity, personal-relationships and service excellence
6	Private sector: Hospitality	Hotel and retail	1,800	Taking initiative, unity, hospitality, excellence and integrity

Note. The organizational culture values were retrieved from their 2019 annual reports.

at least a Bachelor's degree. The employees held a variety of jobs and roles in customer service, tax administration, education, consulting, third-party logistics and technology design. Table 1 shows the profiles of the six involved (non-competing) organizations; each of them promoted innovation-based values such as 'original', 'creativity', 'excellence' and 'taking initiative'.

Table 2 presents the respondents' demographics. Analysis of variance showed significant differences between the organizations on all the variables except TFL, increasing the potential generalizability of the results.

The first author was engaged by the six organizations to develop innovation and leadership skills. It was only after analysing the survey results presented here that the comparative results and practical recommendations were presented to the executives, followed by customized skills training.

3.3 | Measures

3.3.1 | Innovative work behaviour

The IWB measurement was based on the nine Janssen (2000) items. We used a 7-point Likert scale (1 = *never*, 7 = *always*; $\alpha = .93$). An example item is *I search out new working methods, techniques or instruments*.

3.3.2 | Transformational leadership

Transformational leadership was assessed by the 20-item Multifactor Leadership Questionnaire, Form 5X (Bass & Avolio, 1997), licensed by Mindgarden. Employees were asked to rate how often their

TABLE 2 Means of examined variables per organization and *F*-test results

Org. #	N	Gender[a]	Age	Tenure (years)	Role tenure (years)	Transformational leadership	Perceived support for innovation	Innovation readiness	Innovative work behaviour	Marker variable
1	9	1.33	28.44	1.29	1.20	4.91	4.77	5.27	4.42	5.56
2	39	1.74	30.49	2.28	1.76	5.29	5.29	5.68	4.68	5.82
3	62	1.40	30.85	2.84	2.25	4.81	4.81	5.29	4.36	5.64
4	27	1.30	38.19	2.70	NA[b]	5.41	4.55	5.18	4.74	5.98
5	116	1.53	43.20	5.31	6.55	5.05	5.16	5.79	5.02	5.98
6	153	1.31	33.30	2.71	3.03	5.08	4.97	5.56	4.85	5.75
F		7.02**	29.35**	9.84**	13.02**	1.61	3.44**	7.22**	3.78**	2.71*

[a]1 = woman; 2 = man.
[b]Role tenure was not available for Organization 4.
*$p < .05$.
**$p < .01$.

immediate supervisors displayed various behaviours on a 7-point Likert scale (1 = *never*, 7 = *always*, α = .97). An example item is *My manager talks optimistically about the future*.

3.3.3 | Perceived support for innovation

Perceived support for innovation was determined with 10 adjusted items from the Scott and Bruce (1994) measure. Answers were rated on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*; α = .90). An example item is *There are adequate resources devoted to innovation in my department*.

3.3.4 | Innovation readiness

Innovation readiness was measured using a composition of the Holt et al. (2007) seven-item *change efficacy* scale and the Rafferty et al. (2013) three-item *readiness for change* scale. The items were rephrased from 'change' to 'innovation'. The answers were anchored on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*; α = .83). After factor analysis, three items with a loading of less than .50 were removed. The remaining seven items loaded on one single factor, accounting for 49.20% of the variance. An example item is *I think there are real business/organizational needs that make innovation necessary*.

3.3.5 | Control variables

Gender, tenure (Mumford et al., 2002; Reuvers et al., 2008) and organization type (private vs. public) were included as control variables. To control the common method variance, we used in-role behaviour (Williams & Anderson, 1991) as a marker variable consisting of four of the socially desirable items, assessed with a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*; α = .82). A sample item is *I always complete the duties specified in my job description*.

3.4 | Data analysis

To curb common method bias, we took multiple countermeasures (Podsakoff et al., 2003; Spector, 2006). First, we used existing and validated scales (Harrison et al., 1996) and ensured respondent anonymity and confidentiality (Podsakoff et al., 2012). Then, a Harman one-factor test was performed to investigate whether common method bias was a problem (Podsakoff et al., 2003; Podsakoff & Organ, 1986) among all the items (excluding the marker variable). We found that one single factor explained 34.29% of the variance of all the items and therefore concluded that common method bias was not a major problem (Podsakoff et al., 2003; Podsakoff & Organ, 1986). Nevertheless, we controlled for it with the following steps.

The measurement model was tested by means of confirmatory factor analysis (CFA); see Table 3. The expected four-factor model fit the data well: $\chi^2(983) = 2{,}201$, $p < .001$, CFI = .90, RMSEA = .06, SRMR = .05 (Hu & Bentler, 1999). To control for common method variance, we constructed a common latent factor with paths to all the items involved in the model; thus, common variance was extracted from the item scores. The fit statistics were: $\chi^2(938) = 1{,}961$, $p < .001$, CFI = .92, RMSEA = .05, SRMR = .05. The difference between the two models was significant ($\chi^2[45] = 240$, $p < .05$), showing the need to control for the common latent factor. A disadvantage of this is that a part of the functional relationships between the constructs may be omitted.

To control for the remaining common method variance, we followed Tehseen et al. (2017), with in-role behaviour as a marker variable. Although in-role behaviour is theoretically unrelated to the study variables, research has shown that TFL is related to subordinate job performance (Ng, 2017). Therefore, in-role behaviour may also partialize out some of the functional relationships; hence, the resulting path coefficients represent *conservative* estimates of the real relationships.

Although TFL and perceived support for innovation refer to the department level, we assessed and used them in the analyses at the individual level. Within the departments with three or more participants, the ICC(1)s of TFL and perceived support for innovation were

TABLE 3 Confirmatory factor analysis

Variables and items	Estimate
Transformational leadership	
My manager helps me develop my strengths	0.85
My manager acts in ways that builds my respect	0.85
My manager expresses confidence that goals will be achieved	0.83
My manager articulates a compelling vision of the future	0.82
My manager talks enthusiastically about what needs to be accomplished	0.82
My manager talks optimistically about the future	0.82
My manager emphasizes the importance of having a collective sense of mission	0.81
My manager gets me to look at problems from many different angles	0.79
My manager seeks differing perspectives when solving problems	0.79
My manager specifies the importance of having a strong sense of purpose	0.78
My manager instils pride in me for being associated with him/her	0.78
My manager spends time teaching and coaching	0.76
My manager suggests new ways of looking at how to complete assignments	0.76
My manager talks about my most important values and beliefs	0.76
My manager re-examines critical assumptions to question whether they are appropriate	0.75
My manager considers the moral and ethical consequences of decisions	0.75
My manager displays a sense of power and confidence	0.74
My manager goes beyond self-interest for the good of the group	0.66
My manager considers me as having different needs, abilities and aspirations from others	0.64
My manager treats me as an individual rather than just a member of a group	0.36
Perceived support for innovation	
My department is open and responsive to change	0.81
Creativity is encouraged in my department	0.76
My department publicly recognizes those who are innovative	0.73
Assistance in developing new ideas is readily available in my department	0.71
My department can be described as flexible and continually adapting to change	0.69
In my department, people are allowed to try to solve the same problems in different ways	0.68
Our ability to function creativity is respected by the leadership	0.68
My department gives me free time to pursue creative ideas during the workday	0.58
There are adequate resources devoted to innovation in my department	0.57
The reward system in my department encourages innovation	0.56
Innovation readiness	
When implementing innovation, I feel I can handle it with ease	0.67
I have the skills that are needed to make this innovation work	0.67
When I set my mind to it, I can learn everything that will be required when innovation is adopted	0.66
I see the potential advantages of change	0.65
I am ready for organizational change	0.65
I feel hopeful about change	0.62
I think there are real organizational needs that make innovation necessary	0.51
Innovative work behaviour	
I generate new ideas for improvement	0.83
I introduce innovative ideas in a systematic way	0.83
I transform innovative ideas into applications	0.81
I evaluate thoroughly the application of innovative ideas	0.80
I mobilize support for innovative ideas	0.78

(Continues)

TABLE 3 (Continued)

Variables and items	Estimate
I generate original solutions to problems	0.77
I make important organizational members enthusiastic for innovative ideas	0.75
I search out new working methods, techniques or instruments	0.73
I acquire approval for innovative ideas	0.55

Note: Without common latent factor: TLI = .90. With common latent factor: TLI = .91.

.00 and .07, respectively, and their ICC(2)s were .05 and .31, respectively (see Table 4). These values were far too low to allow aggregation at the department level (see LeBreton & Senter, 2008). The results show that the assumption of independence of the data nested within the departments was not violated. Therefore, all the hypotheses' variables, including TFL and perceived support for innovation, were tested at the individual perceptual level. However, multilevel analysis was used to control for the effects at the organizational level, as indicated below.

To investigate whether the means of the study variables differed between the organizations, we performed ANOVAs on the scale scores. The results in Table 2 show that these differences are significant for all the scales except TFL. Therefore, we also calculated the ICCs at the organization level (see Table 4). The ICC(1) of one of the study variables was above the critical value of 0.08, and three of the ICC(2)s were above the critical value of 0.70 (LeBreton & Senter, 2008). These findings indicated that the variables at the organization level should be taken into account. Therefore, we performed multilevel analyses with the individual as the first level and the organization as the second level. The effects of the variables at the organizational level may be insignificant and meaningless if the sample consists of a small number of organizations but should nevertheless be controlled for. The factor scores of the latent variables, as calculated in the CFA, were saved and used further in the multilevel analyses. These scores were corrected for common latent factor. In addition, gender, tenure and the marker variable of in-role behaviour were entred in these analyses as control variables.

The mediation effects were investigated with the joint significance method: 'The best balance of Type 1 error and statistical power across all cases is the test of joint significance of the two effects compromising the intervening variable effect' (MacKinnon et al., 2002, p. 83). Accordingly, a mediation effect is present when the relationship between the independent variable and mediator is significant, and the relationship between the mediator and dependent variable, by controlling for the independent variable, is also significant. However, this method does not test the direct relationship between the independent and dependent variables.

In addition to the hypotheses, the three-path mediation model shown in Figure 1 was tested using multilevel analysis in SPSS. Such a model assumes that two mediators (M1 and M2) intervene in a series between an independent and a dependent variable (X and Y). Taylor et al. (2008) indicated that three conditions must be met to conclude that such a model is supported: (1) the relationship between X and M1 is significant; (2) the relationship between M1 and M2, while controlling for X, is significant and (3) the relationship between M2 and Y, while controlling for X and M, is significant. In the present study, we tested whether the relationship between transformational leadership and IWB was mediated by perceived support for innovation and innovation readiness in a series. As an additional robustness check of the hypothesized model, we also tested some alternative mediation and moderation models.

To check whether organization type affects the results, we divided the organizations into two groups: private service organizations and public service organizations, and calculated the partial correlations among the study variables, controlled for by type of organization. These partial correlations were compared with the zero-order correlations presented in Table 5. The differences were very small and far from significant. This showed that the private and public service organization results did not differ.

4 | RESULTS

4.1 | Correlation analysis

The descriptive statistics of the original scale scores and control variables are presented in Table 5. The reliability of all the scales was satisfactory. The correlations showed that, consistent with the hypotheses, TFL is related to perceived support for innovation ($r = .61$, $p < .01$) and IWB ($r = .54$, $p < .01$); perceived support for innovation is related to innovative readiness ($r = .42$, $p < .01$) and innovative readiness is related to IWB ($r = .60$, $p < .01$).

4.2 | Hypotheses testing

The results of the multilevel analyses to test the hypotheses are presented in Table 6. Hypothesis 1 states that TFL is related to IWB. The relationship between the SEM-based estimates of these variables, controlled for by the common latent factor, transformational leadership at the organizational level, gender, age and the marker variable of in-role behaviour, was significant (standardized estimate = .37, $p < .001$). Therefore, Hypothesis 1 is supported. Similar controls were used in the following tests.

According to Hypothesis 2, perceived support for innovation mediates the relationship between TFL and IWB. Multilevel analyses

TABLE 4 ICCs of the study variables at the departmental and organizational level

	Departmental level		Organizational level	
Variables	**ICC(1)**	**ICC(2)**	**ICC(1)**	**ICC(2)**
Transformational leadership	.00	.05	.01	.38
Perceived support for innovation	.07	.31	.03	.71
Innovation readiness	.05	.25	.08	.86
Innovative work behaviour	.03	.16	.04	.74

TABLE 5 Summary of descriptive statistics and zero-order correlations ($N = 406$)

Variables	Mean	S.D.	1	2	3	4	5	6	7
1. Transformational leadership	5.07	1.10	(.97)						
2. Perceived support for innovation	5.00	.93	.61**	(.86)					
3. Innovation readiness	5.56	.69	.31**	.42**	(.90)				
4. Innovative work behaviour	4.79	1.04	.54**	.45**	.60**	(.93)			
5. Marker variable	5.82	.73	.21**	.30**	.62**	.40**	(.82)		
6. Gender[a]	1.43	.50	.09	.08	.19**	.24**	.09		
7. Tenure (years)	3.40	3.73	−.01	.05	.04	.02	.05	−.04	
8. Organization type[b]	1.32	.47	.01	−.07	−.18**	−.16**	−.05	.08	−.14**

Note. Cronbach alphas are presented on the diagonal between parentheses.
[a]1 = woman; 2 = man.
[b]1 = private service organization; 2 = public service organization.
**$p < .01$.

showed that TFL was significantly and strongly related to perceived support for innovation (standardized estimate = .64, $p < .001$) but that the relationship between perceived support for innovation and IWB, while controlling for the effect of TFL, is not significant (standardized estimate = .06, ns). Hypothesis 2 is not supported here.

Hypothesis 3 states that innovation readiness mediates the relationship between TFL and IWB. This hypothesis is supported as TFL was significantly related to innovation readiness (standardized estimate = .17, $p < .001$), and innovation readiness is significantly and strongly related to IWB while controlling for TFL (standardized estimate = .66, $p < .001$).

Hypothesis 4 postulates that innovation readiness mediates the relationship between perceived support for innovation and IWB; this is also supported by the data. Perceived support for innovation was significantly related to innovation readiness (standardized estimate = .28, $p < .001$), and innovation readiness was significantly and strongly related to IWB while controlling for perceived support for innovation (standardized estimate = .70, $p < .001$).

4.3 | Three-path mediation

We also tested whether the two mediators in a series mediate between TFL and IWB: first, through perceived support for innovation and, second, through individual innovation readiness. The first step in this analysis was to test the relationship between TFL and perceived support for innovation, which was already found to be significant (see Tables 5 and 6). In the second step, the relationship between perceived support for innovation and innovation readiness was tested, by controlling for TFL, and was found to be significant (standardized estimate = .29, $p < .001$). The third step involved testing the relationship between innovation readiness and IWB, by controlling for TFL and perceived support for innovation. Because this relationship was also significant (standardized estimate = .71, $p < .001$), the three-path mediation model was supported. This model is presented in Figure 1.

An alternative model, where the order of the mediators was reversed, was not supported by the results. In the third step of testing this model, the relationship between perceived support for innovation and IWB, while controlling for TFL and innovative readiness, was significant but negative (see last column in Table 6; standardized estimate = −.15, $p < .01$), whereas it was supposed to be positive. Also, another alternative model, in which the order of innovation readiness and IWB was reversed, was not supported, because in the second step of the test, perceived support for innovation was not significantly related to IWB, while controlling for TFL (see the second step in testing Hypothesis 2, Table 6; standardized estimate = .06, ns). Finally, we examined whether support for innovation and readiness to change moderated the relationships between other variables, but our analyses showed that this was not the case. All in all, we can conclude that our initially hypothesized three-path model of the relationship between transformational leadership and IWB, mediated by perceived support for innovation and innovation readiness in a series, is supported by our data.

TABLE 6 Results of multilevel analyses to test the hypotheses

Independent variables and controls	Hypothesis 1	Hypothesis 2		Hypothesis 3		Hypothesis 4		Three-path, steps 2 and 3	
	Innovative work behaviour	Perceived support for innovation	Innovative work behaviour	Innovation readiness	Innovative work behaviour	Innovation readiness	Innovative work behaviour	Innovation readiness	Innovative work behaviour
Transformational leadership (individual level)	.37***	.64***	.33***	.17***	.25***			−.01	.34*
Transformational leadership (organizational level)	−.11	−.38	−.18	−.40	.14			−.48	.33
Perceived support for innovation (individual level)			.06			.28***	.09*	.29***	−.15**
Perceived support for innovation (organizational level)			.24			.59*	−.62	.66*	−.79*
Innovation readiness (individual level)					.66***		.70***		.71***
Innovation readiness (organizational level)					−.19		.22		.52
Gender[a]	.19***	−.02	.19***	.10*	.13***	.09**	.13***	.10**	.12***
Age	.10*	.09*	.10*	.11**	.03	.09*	.02	.09*	.02
Marker variable	.34***	.19***	.33***	.56***	−.03	.50***	−.05	.50***	−.04
−2 restricted log likelihood	980.63	877.11	983.12	919.29	796.27	882.05	844.39	884.55	785.51

Note. The coefficients are standardized estimates.

[a]1 = woman; 2 = man.

*$p < .05$.

**$p < .01$.

***$p < .001$.

5 | DISCUSSION

This study's tested hypotheses support an integrated three-path model that links TFL to employee IWB in a collectivistic Asian culture: both directly and through two motivational mechanisms which 'translate' a set of leader behaviours into innovative employee work behaviour. The hypothesized three-path mediation model is supported, including the positive influence of TFL through perceived support for innovation and individual innovation readiness for IWB. These findings are valid for both public and private sector service organizations in Singapore. Because perceived support for innovation did not mediate the relationship between transformational leadership and IWB, whereas the three-path mediation model was supported, the results show that the indirect effect of transformational leadership does not lead to IWB through perceived support for innovation, but through innovation readiness. The causal order of these variables should be investigated in longitudinal and experimental studies.

Our study provides several theoretical contributions. The first is to the leadership and individual-level innovation literature with empirical evidence of a positive relationship between TFL and IWB in a collectivistic culture. Research on transformational leadership in collectivistic cultures suggested that transformational leadership can emerge easily in such cultures (Mittal, 2015). The positive significant relationship obtained with our data suggests that Asian organizations, in which collectivism is more prevalent than in Western organizations, can facilitate employee innovation by investing in TFL. Exactly how an Asian transformational leader behaves differently, outwardly, from an otherwise equivalent American or European (or non-Asian) transformational leader would be worth future observation-type research. The results of such comparative studies could inform those who train Asian leaders on adapting this style (in indigenous, culturally correct ways), because TFL is a behaviourial style developed mainly by American scholars. Given the outcome of this study, culturally specific Asian variants appear to be practically relevant.

Second, our results extend the TFL and IWB relationship theory by demonstrating the link is mediated by the two examined mechanisms. We find the relationship between TFL and IWB is not only mediated by followers' perceived support for innovation but also by their degree of individual innovation readiness. This outcome expands the theory in two ways. First, a mediating rather than a moderating role emerges for perceived support for innovation, which may be due to the all-Asian context of this study. Further cross-cultural testing of the relationships between TFL, perceived support for innovation, innovation readiness and IWB is urged (Devloo et al., 2016). It also expands the available theory on innovation readiness, especially individual-level applications of the Weiner (2009) organizational readiness to change framework, thereby integrating the key role of TFL in inducing followers' innovation readiness. Effective leadership can be seen as a specification of the organizational culture element in Weiner's model, given the fact that organizational leadership and culture are two sides of the same coin (Areiqata et al., 2020).

Third, the mediating effect of individual innovation readiness between TFL and IWB corroborates prior research by Eisenbeiß and Boerner (2010), who showed that transformational leaders stimulate IWB by increasing employees' confidence in their own innovative behaviours. Thus, future research could delve even deeper into the innovation effects of certain observable micro-behaviours of both transformational leaders (Hoogeboom & Wilderom, 2019; Van Dun et al., 2017; Yukl, 2012) and followers (Qu et al., 2015; Van Dun & Wilderom, 2021) on employee IWB, including the perception that there are sufficient resources for innovation and employee readiness to innovate. Even more of such refined behavioural insights could eventually propel more workers towards IWB.

5.1 | Practical implications

It is known that, to promote employee IWB, their leaders must have a transformational leadership style. This study shows that this is also the case in a collectivistic culture like Singapore. Insofar leaders lack idealized influence, inspirational motivation, intellectual stimulation and individualized consideration abilities; they may need to be trained to adopt these behaviours.

In fact, our study purports that the more leaders role model innovation (i.e., demonstrate confidence in their employees, provide intellectual stimulation and support and appreciate their innovative efforts), the more the Asian employees experience support for innovation and then see themselves as equipped to innovate their work rather than worry that they may be punished for their creativity. Hence, employees' individual innovation readiness and their subsequent IWBs are related to the leaders acting as coaches and mentors and the ensuing perceived support for innovation. Thus, managers are advised to lead the way and ensure their followers feel IWB is supported and so also feel ready to embrace IWB, thereby reducing the often-common resistance to start new and useful things at work. The engendering of role modelling innovation should enable Asian leaders to overcome their own potential fear of losing ('Kiasu') (Cheng & Hong, 2017), which might require personal coaching if they are up to this challenge. In addition, leaders can provide support by eliminating existing bureaucratic processes and organizing trainings or workshops for employees, so that they can cope well with the ambiguity and uncertainty associated with (anticipated) organizational changes due to any pending or potential innovations (Katsaros et al., 2020).

After analysing the data, we offered organizational feedback reports, including recommendations for optimizing change management, innovation and creative problem-solving techniques to address operational issues. Similar assessments can be used by HR as part of innovation-readiness or leadership-development programmes (Kelloway et al., 2000), possibly accompanied by various other interventions to ultimately encourage more innovative employee behaviour at work.

5.2 | Strengths, limitations and future research

The cross-sectional, single-actor research design offers a first attempt at modelling serial mediation between TFL and employee IWB. We extend the extant knowledge by examining two important psychological mechanisms between TFL and IWB in Singapore's service industry. Future field research should take a longitudinal approach to the precise causal nature of these mediators as well as their effects in terms of job performance or potential moderation effects. There were no significant differences between the private- and public-sector service employees.

In terms of statistics, two precautions must be taken. First, although most of the fit indices of the measurement models met the criteria, the TLI and CFI indices were slightly below the .95 cut-off point, thus warranting replication studies. The perceptual measures used in the current study should, ideally, be complemented by objective measures of innovation, such as the number of patents, technical reports and customer feedback (Chen et al., 2014), as well as manager and peer assessments of the degree of innovation or employee IWB. Second, because the 'in-role behaviour' marker variable may have some functional relationships with the study variables, the results may be slightly biased. However, by controlling for this variable, the results were on the conservative side, which gave us more confidence in the results (Williams et al., 2010).

New leadership research on engendering effective employee IWB should be conducted at individual and aggregated group levels. Moreover, the heterogenous impacts of the four TFL components on IWB would need to be unravelled. Even though prior studies claim that TFL's four dimensions are highly correlated and reflect the higher order construct of TFL (e.g., Avolio & Bass, 1995), scrutinizing the behavioural dimensions in combination with the two mediators examined here can help us understand the role of TFL in enhancing IWB. Additionally, as suggested recently that disparate dimensions of leadership may be related differently to various aspects of innovation (Mascareño et al., 2020a, 2020b), follow-up studies should explore how these aspects can be predicted by TFL and the here examined serial mediators. Thus, we concur with Yukl (2012) and Van Knippenberg and Sitkin (2013) that the TFL theory could become even more precise in identifying the necessary influence processes.

Finally, our diverse Singapore sample provides insights into the antecedents of IWB in a collectivistic, Confucian Asian culture (Dorfman et al., 2012; D.I. Jung et al., 1995). Because our study was conducted in a single country, we may have tacitly assumed that the effects of TFL are universal (Gumusluoglu & Ilsev, 2009). Thus, a future study looking into whether the effects of each of the four dimensions of TFL on IWB are universal or differ across cultures, as highlighted by Watts et al. (2020), is needed. Our study did not specifically measure national and organizational cultural effects on the relationship between TFL and IWB: hence, future studies must explore them. We hope multi-level, cross-cultural longitudinal field studies can be sparked to further illuminate these economically important motivational mechanisms towards innovations.

ACKNOWLEDGEMENTS

This paper and the research behind it would not be possible without the continuing support of the participating organizations in Singapore. We are also grateful for the generous and insightful comments offered by anonymous peer reviewers at both the 19th Annual CINet Conference and the 11th Asia Academy of Management conference. Finally, we would like to sincerely thank Dr. Peter van den Berg for his engagement in the data analytical process.

ENDNOTE

[1] Keyword searches were performed in multiple databases: Emerald, Factiva, JSTOR, Mendeley, Microsoft Academia, PsycINFO, ScienceDirect, Scopus, SpringerLink, Sage and Web-of-Science. We combined 'innovation readiness' and 'individual' as keywords.

DATA AVAILABILITY STATEMENT

Research data are not shared. The reason is we have promised the participants and participating organisations that we will follow data protection and privacy practice.

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How to cite this article: Tan, A. B. C., Van Dun, D. H., & Wilderom, C. P. M. (2021). Innovative work behavior in Singapore evoked by transformational leaders through innovation support and readiness. *Creativity and Innovation Management*, 1–16. https://doi.org/10.1111/caim.12462