Linking empowering leadership to work-related well-being and project citizenship behavior in the construction context: a self-determination perspective

Ziyao Zhang and Guodong Ni

School of Mechanics and Civil Engineering, Institute of Project Management, China University of Mining and Technology, Xuzhou, China

Han Lin

School of Engineering Audit, Nanjing Audit University, Nanjing, China

Zongbo Li

School of Economics and Management, China University of Mining and Technology, Xuzhou, China, and

Zhipeng Zhou

College of Economics and Management, Nanjing University of Aeronautics and Astronautics, Nanjing, China

Abstract

Purpose – This paper aims to investigate the relationships between empowering leadership, basic psychological needs satisfaction, work-related well-being, and project citizenship behavior.

Design/methodology/approach – Drawing upon the self-determination theory (SDT), a conceptual model was developed and then empirically tested using a cross-sectional survey of 435 project members in Chinese construction projects.

Findings – The results fully support the research hypotheses proposed in the study, illustrating the positive impacts of empowering leadership on work-related well-being and project citizenship behavior, the mediating role of basic psychological needs satisfaction, and the positive association between work-related well-being and project citizenship behavior.

Practical implications – This research determines the utility of empowering leadership in the context of construction projects, especially in enhancing individual outcomes (i.e. work-related well-being and project citizenship behavior). Therefore, construction project managers can apply empowering leadership to meet the basic psychological needs of subordinates to increase project members' work-related well-being and project citizenship behavior.

Originality/value – To our knowledge, the present study first explores the micro-level impacts of empowering leadership in the construction context. Additionally, this study enriches the understanding of the mediating mechanism between empowering leadership and individual outcomes from a self-determination perspective.

Keywords Empowering leadership, Work-related well-being, Project citizenship behavior, Basic psychological needs satisfaction, Self-determination theory

Paper type Research paper

Introduction

Construction projects involve a series of team-oriented activities under time, budget, and resource constraints, and the technical contributions of these teams from different fields contribute to the achievement of project goals. In this context, a large portion of past studies concentrated on technical aspects and how to effectively meet project deliverables under the triple constraint (time, cost, quality), while the role of humans in projects as critical success factors has been rarely discussed (Imam, 2021). However, there is growing evidence in the literature that project leadership is fundamentally responsible for the success of construction projects (Toor and Ofori, 2008; Larsson *et al.*, 2015; Luo *et al.*, 2022). The leadership literature has identified a series of leadership styles and their possible impacts in the case of general organizations, but the understanding of leadership styles and their impacts is limited at best in the context of temporary project organizations (Raziq *et al.*, 2018). Compared to traditional organizations, projects have unique attributes such as their temporal nature, level of diversity, unique products/services, and the diverse needs of stakeholders (Imam and Zaheer, 2021). General leadership research does not take these attributes into account, and a specific leadership style may not replicate its effectiveness in projects. This underscores the need to conduct leadership research in a project context.

From the macro aspect, the increasing construction project scale and scope, and dynamic project environment necessitated an effective leadership paradigm to quickly respond to complex and unexpected situations and decision-making scenarios (Zheng *et al.*, 2021; Luo *et al.*, 2022). From the micro aspect, traditional project leaders usually give instructions and then evaluate the progress of the entire project, which does not strengthen members' autonomy and tends to create information silos (Imam, 2021). For these reasons, more and more project researchers call for empowerment to maximize the role of subordinates (Nauman *et al.*, 2010; Müller *et al.*, 2018; Yu *et al.*, 2018). Empowering leadership, as a leadership paradigm that emphasizes empowerment practices as means to enhance individuals' intrinsic motivation and personal effectiveness, is one of the most widely accepted paradigms in leadership literature (Lee *et al.*, 2018; Cheong *et al.*, 2019). In a construction project context, empowering leadership can effectively foster subordinates' motivation and ability for working autonomously through a series of empowering and enabling practices, thus reducing the burden on leaders. Additionally, distinct from other active constructive leadership styles, such as transformational leadership that has been widely proven to promote project performance (Aga *et al.*, 2016; Ding *et al.*, 2017; Tabassi *et al.*, 2017), empowering leadership emphasizes autonomy and independence, while transformational, directive and transactional leadership do not involve delegating resulting in followers' developing of more dependence on leaders (Amundsen and Martinsen, 2014). In a dynamic construction project environment, project members can be included in the process of project leadership development to prepare them to exercise self-leadership and self-reliance, so as to achieve self-directed management in complex project scenarios. In brief, empowering leadership, which amplifies the personal utility of project members to cope with complex work requests, has excellent potential for construction projects and other temporary organizational forms.

The existing literature also provides evidence for the benefits of empowering leadership in the construction and broader project management domain. Both Zhou *et al.* (2016) and Zheng *et al.* (2021, 2022) found that empowering leadership positively impacts temporary construction project team performance and construction project performance at a macro level. Even though they have generally provided insights into the utility of empowering leadership in a construction project context, it still needs to supplement the analysis on the effectiveness of empowering leadership at a micro level. In this regard, two critical questions remain: How does being led by empowering leadership influence project members' individual outcomes? More importantly, why are project members led by empowering leadership more likely to achieve higher levels of individual outcomes? It is vital to address the above

questions because the interaction between immediate supervisors and subordinates at the dyadic level is the most common form in the workplace (Lin and Chan, 2020). Understanding how and why leadership styles affect subordinates' emotions, attitudes and behaviors is crucial for organizational development (Zhang and Bartol, 2010).

Accordingly, the present study aims to explore the link between empowering leadership and project members' individual outcomes, more precisely employee well-being and organizational citizenship behavior, which are the most important individual outcomes accentuated by organizational researchers (Fisher, 2010; Podsakoff et al., 2014). This study focuses on project members' well-being in the workplace, namely work-related well-being, which encompasses individuals' positive evaluation and emotional experience of all aspects of the current work (Fisher, 2010). Due to the arduous, heavy, and harsh working conditions and environments, as well as the uncertain and dynamic project context, it is particularly urgent to improve work-related well-being in the construction industry (Turner et al., 2008; Mostert et al., 2011; Langdon and Sawang, 2018; Sang et al., 2019). This study also concentrates on organizational citizenship behavior in the project context, that is, project citizenship behavior, which refers to individual behavior beyond one's duty that project participants perform spontaneously, such as collaboration across organizations, voluntary investment of more time and effort (Braun et al., 2012, 2013). The lubricating role of project citizenship behavior during project execution has been repeatedly emphasized because it fills the gap between role behaviors based on job description and role behaviors required by changing environment (Braun et al., 2013; Ferreira et al., 2013; Yang et al., 2018, 2020).

This study also aims to delve deeper into the association between empowering leadership and individual outcomes by investigating the psychological mechanism underlying this association. Drawing on the self-determination theory (SDT), the mediation role of basic psychological needs satisfaction is explored from a self-determination perspective. Within SDT, basic psychological needs are defined as "innate psychological nutriments that are essential for ongoing psychological growth, integrity, and well-being" (Deci and Ryan, 2000, p. 229). On the one hand, SDT assumes that individuals must continuously meet their basic psychological needs, so as to achieve optimal functioning and experience healthy growth and well-being (Deci and Ryan, 2000; Costa et al., 2015). On the other hand, SDT deems that when the situational factors meet the basic psychological needs of individuals, their intrinsic motivation can be maintained and enhanced, thereby showing more proactive behaviors (Chiniara and Bentein, 2016; Van den Broeck et al., 2016). In this study, the authors predict that empowering leadership can promote project members' work-related well-being and project citizenship behavior via their basic psychological needs satisfaction. Additionally, it is valuable to further explore the relationship between work-related well-being and project citizenship behavior. Based on the happy productive worker thesis (Wright and Cropanzano, 2000), the impetus effect of project members' work-related well-being on their project citizenship behavior is likely to occur.

In general, the present study strove to contribute to the existing literature in three ways. First, the effects of empowering leadership on work-related well-being and project citizenship behavior are analyzed to expand empowering leadership research at the micro level in a construction project context, and the effectiveness of empowering leadership in the construction industry is empirically validated. Second, this study adds to the emerging evidence on the underlying psychological mechanism of how empowering leadership affects work-related well-being and project citizenship behavior. Our study extends the existing research stream by offering a self-determination perspective to understand how empowering leadership promotes individual outcomes. Third, an additional contribution is to determine the positive association between work-related well-being and project citizenship behavior, which responds to the call for more research examining the impact of different forms of employee well-being on extra-role behavior (Turban and Yan, 2016).

Literature review and hypotheses development

Self-determination theory (SDT)

SDT is a general theory of optimal functioning and human motivation (Vansteenkiste *et al.*, 2010). SDT assumes that humans are active organisms with inherent psychological growth tendencies and self-determination potential. The self-determination of behavior means that an individual's behavior can be either proactive or reactive; what kind of behavior to perform depends on whether contextual conditions drive or hinder one's intrinsic motivation (Ryan and Deci, 2000; Gagné and Deci, 2005). SDT deems that when the organizational environment meets an individual's basic psychological needs, their intrinsic motivation can be maintained and enhanced, thereby having a higher level of positive psychological experience and showing more active behavior (Chiniara and Bentein, 2016; Van den Broeck *et al.*, 2016). Given the above, it can be said that basic psychological need satisfaction serves as an intermediate process between situational factors and individual spontaneous behavior.

Deci and Ryan (2000) identified autonomy, competence, and relatedness as individuals' basic psychological needs after long-term research. Among them, autonomy refers to the individual's need for a sense of freedom to engage in activities according to their own will and choice; competence refers to the need for feeling effective and skillful in one's actions and controlling over the surrounding environment; relatedness refers to the need for support, care and respect from the surrounding environment or others. SDT assumes that when these needs are met, individuals can have a subjective feeling that their behavior resonates with their true selves (Leroy *et al.*, 2015).

To date, SDT has been widely used to investigate psychological mediation processes of leadership styles that influence employees' outcomes (e.g. Leroy *et al.*, 2015; Chiniara and Bentein, 2016). This theory has also received some attention in temporary organizations, and the self-determination process of employees' extra-role behaviors has been examined. For example, Terhorst *et al.* (2018), through an exploratory study in open innovation projects, concluded that a team culture that satisfies members' needs for autonomy, competence, and relatedness contributes to their knowledge sharing behavior. In the construction context, basic psychological needs satisfaction also shows strong validity in predicting extra-role behavior (e.g. Imam, 2021). Therefore, this study used SDT as its theoretical basis to explain the relationship between empowering leadership as a situational factor that acts on project members' basic psychological needs and thus affects their well-being and behavior.

Work-related well-being

With the rise of positive psychology, employee well-being has been concerned by tremendous researchers. Organizations are also full of interest in promoting well-being in the workplace because employees with high levels of well-being tend to have higher levels of health, productivity, and other outcomes (Fisher, 2010). For the definition and conceptualization of work-related well-being, there are still disagreements on how better to define and conceptualize it. From the perspective of subjective well-being, namely hedonism, work-related well-being is regarded as an individual's work-related emotional experience and cognitive evaluation (Xanthopoulou *et al.*, 2012). From the perspective of psychological well-being, namely eudaimonism, work-related well-being refers to an individual's perception and evaluation of the realization of value and potential in the workplace (Dagenais-Desmarais and Savoie, 2012). The former emphasizes subjectivity, pleasure-based, and enjoyment, while the latter underlines objectivity, meaning-based, and development (Fisher, 2010). Most studies have recognized and accepted the validity of these two disparate paradigms, and the comprehensive approach that integrates the two perspectives is increasingly popular (Zheng *et al.*, 2015). In this study, work-related well-being is defined from an integrated perspective, referring to the overall quality of an employee's experience and functioning at work (Grant *et al.*, 2007).

Project citizenship behavior
Organizational citizenship behavior refers to "individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization" (Organ, 1988, p. 4). In the domain of project management, Braun *et al.* (2012) introduced the concept of project citizenship behavior on the basis of the unique features of the project (i.e. time, task, teams, and transition), making organizational citizenship behavior adapt to the project context. In their subsequent study, Braun and his colleagues identified five dimensions of project citizenship behavior (i.e. helping behavior, project loyalty, project-based compliance, individual initiative, and relationship maintenance) and validated that project citizenship behavior has a positive impact on the "iron triangle" of the project, namely time, cost and quality (Braun *et al.*, 2013). The researchers highlight the importance of project citizenship behavior as individuals' micro actions to project success (Braun *et al.*, 2013; Ferreira *et al.*, 2013). Existing studies have examined the distal and proximal antecedents of project citizenship behavior, such as external pressures, organizational support and responsibility (Wang *et al.*, 2017, 2018a), justice perceptions (Lim and Loosemore, 2017), work-family conflict and project commitment (Xia *et al.*, 2018), non-economic motivations (Yang *et al.*, 2020), emergency event and positive emotion (Wang *et al.*, 2021). Despite the diverse studies associated with project citizenship behavior, researchers investigating the processes leading to project citizenship behavior have limited consideration of the possible influence of leadership.

This study focuses on three types of project citizenship behavior among project members, namely, helping behavior, project-based compliance, and individual initiative. As one of the most common dimensions of citizenship behavior, helping behavior describes the behavior of actively providing help to others, and involves taking measures to prevent and solve work-related problems (Podsakoff *et al.*, 2000). As construction projects are often embedded between different organizations, such project-specific helping behavior can cross organizational boundaries (Braun *et al.*, 2012, 2013). In the construction environment, the uncertainty of the project and the interdependence of tasks make project members from different organizations have to take temporary assistance and cooperation within a limited time to avoid conflicts and deal with emergencies (Xue *et al.*, 2010; Yang *et al.*, 2018). Therefore, project members' helping behavior is indispensable and vital in construction projects. Project-based compliance refers to individuals not only accepting and internalizing the formal and informal rules, regulations, and procedures of the project, but also strictly and conscientiously complying with them in their behaviors (Braun *et al.*, 2013). Although compliant behavior is duty-bound from an organizational point of view, many employees are not able to do it eternally, so it is regarded as an important kind of citizenship behavior (Podsakoff *et al.*, 2000). In the construction industry, project members are difficult to be closely monitored, resulting in employees not complying with project rules and regulations (e.g. unsafe behavior: Ni *et al.*, 2020). On a broad level, project members' compliant behavior determines project success from different aspects. Finally, individual initiative means that individuals voluntarily and creatively engage in work-related behaviors that exceed the requirements (Podsakoff *et al.*, 2000). According to Ghitulescu (2018), work-related problems that require flexibility and adaptation can trigger individual initiative behavior. In construction projects, such behaviors specifically includes putting forward constructive opinions, adopting advanced management and technical methods, pointing out potential improvements, voluntarily undertaking tasks, etc. (Yang *et al.*, 2018, 2020). Project members' initiative behavior can effectively make them adapt to changing work requirements and further improve task performance by initiating changes.

Empowering leadership and individual outcomes
Empowerment has been defined in two complementary ways. From a socio-structure perspective, empowerment refers to the behaviors and management practices of sharing power or

organizational resources with subordinates (Sharma and Kirkman, 2015). Researchers have conceptualized and validated a set of structural empowerment behaviors, for instance, delegation of authority, leading by example, self-directed decision making, and information sharing (Arnold *et al.*, 2000; Konczak *et al.*, 2000; Srivastava *et al.*, 2006). From the other perspective, empowerment is considered to be an experience that benefits subordinates on a psychological level (Conger and Kanungo, 1988; Thomas and Velthouse, 1990). Psychological empowerment measures an individual's comprehensive psychological experience, including self-efficacy, work meaning, autonomy, and work influence (Conger and Kanungo, 1988; Thomas and Velthouse, 1990). This psychological perspective focuses on the extent to which employees can actually perceive power. The above two perspectives are interrelated, and the degree to which structural empowerment can be transformed into the psychological state of subordinates is the core of the empowerment theory (Zhang and Bartol, 2010; Lee *et al.*, 2018; Kim and Rhee, 2020). Essentially, through a set of power-sharing behaviors (structural empowerment), empowering leadership can promote the psychological empowerment of subordinates (feel empowered), thereby improving individual performance (Cheong *et al.*, 2019). In this study, the authors followed an integrated perspective and defined empowering leadership as "the process of implementing conditions that enable sharing power with an employee by delineating the significance of the employee's job, providing greater decision-making autonomy, expressing confidence in the employee's capabilities, and removing hindrances to performance" (Zhang and Bartol, 2010, p. 109).

Leadership is generally regarded as a critical contextual factor that affects employee well-being in the workplace (Van Dierendonck *et al.*, 2004). The positive relationship between empowering leadership and work-related well-being is well-documented in the literature (Park *et al.*, 2017; Kim and Beehr, 2018a, 2018b; Kim *et al.*, 2018a). We argue that project leaders' empowering behaviors can directly or indirectly affect project members' work-related well-being. On the one hand, the approach/inhibition theory of power predicts that the perceived power makes it easier for individuals to experience positive emotions and less likely to experience negative emotions (Keltner *et al.*, 2003). Further researches also show that empowering leadership can improve subordinates' job satisfaction through psychological empowerment (Fong and Snape, 2015; Amundsen and Martinsen, 2015). On the other hand, the project leaders' empowerment practices, such as encouraging participation in decision-making, are conducive to project members' release of internal potential and fulfillment of self-expression, so as to experience a sense of self-realization. It can be speculated that empowering leadership can positively affect project members' emotional experience and contribute to their self-realization, so as to improve their overall well-being at work. Therefore, the following hypothesis is proposed:

H1a. Empowering leadership has a significant positive influence on project members' work-related well-being.

Hitherto, many researchers have confirmed the positive effect of empowering leadership on citizenship behavior (Auh *et al.*, 2014; Humborstad *et al.*, 2014; Li *et al.*, 2016, 2017; Jiang *et al.*, 2019). We will discuss how project members view empowering leadership and then influence their project citizenship behavior from the following three perspectives.

First, empowering leadership can stimulate project members' project citizenship behavior by awakening their responsibilities and obligations. The recognition and trust that leaders' empowerment practices convey to their subordinates contribute to high-quality social exchange relationship, which inspires their reciprocity motivation, thus impels them to implement citizenship behavior for distributing leaders' burden (Lee *et al.*, 2018). Moreover, due to the leaders' agent roles, empowered employees can achieve the perception of organizational support and affirm their value in the organization. This enhances a sense of cognitive and emotional connection to the organization, thereby motivating employees to make efforts beyond the scope of their duties (Jiang *et al.*, 2019; Kim and Beehr, 2020a).

Second, empowering leadership may motivate project members' project citizenship behavior by facilitating their positive self-development through power, work flexibility, and other psychological resources. There is considerable empirical evidence that empowered employees experience high levels of psychological capital, self-efficacy, psychological empowerment, and thriving at work (Li *et al.*, 2016; Park *et al.*, 2017; Kim *et al.*, 2018b), which in turn positively affect their citizenship behavior (Avey *et al.*, 2010; Li *et al.*, 2016, 2017; Testa *et al.*, 2020). Finally, implementing challenging citizenship behaviors (e.g. personal initiative) means breaking conventional practices or established work patterns, which comes with potential risks and costs (Choi, 2007). According to the approach/inhibition theory of power, elevated power can reduce the individuals' sensitivity to risk and promote the performance of individuals' approach behaviors (Keltner *et al.*, 2003). It can be conjectured that empowering leadership can increase the possibility of project members implementing challenging project citizenship behavior by affecting their risk sensitivity. On these grounds, the following hypothesis is proposed:

H1b. Empowering leadership has a significant positive influence on project members' project citizenship behavior.

Empowering leadership and basic psychological needs satisfaction

As the theoretical basis of SDT, the basic psychological needs are considered as the critical psychological resource for individuals' natural propensity to promote self-development and self-improvement to achieve optimal functioning (Deci and Ryan, 2000; Vansteenkiste *et al.*, 2020). These innate and equally important psychological needs composed of autonomy, competence, and relatedness, are universal across culture, context, and individual differences (Deci and Ryan, 2000).

Empowering leadership can provide subordinates with more work autonomy and right to participate in decision-making, and make them experience less compulsion in work by enhancing the perception of work meaning (Ahearne *et al.*, 2005; Zhang and Bartol, 2010). This can make project members experience a sense of ownership over their behaviors and actions under objective and subjective conditions, thereupon then satisfying their autonomy needs. In addition, by expressing confidence in subordinates' abilities and removing the obstacles of bureaucracy, empowering leadership enables subordinates to believe that they can control and manipulate the surrounding environment and engage in challenging tasks, thereby facilitating the satisfaction of project members' competence needs. Further, the empowering practice of leaders providing substantial supporting resources make subordinates feel supported and valued, and the encouragement to collectively solve existing problems fosters a cooperative team atmosphere; all of these make employees greatly feel the support from the organizations, the leaders and colleagues (Kim *et al.*, 2018a). Accordingly, empowering leadership may further promote the satisfaction of relatedness needs by establishing supportive mutual relationships between project members and the surrounding environment within the project teams. Taken together, the authors believe that empowering leadership can meet project members' basic psychological needs (i.e. need for autonomy, competence and relatedness). Therefore, the following hypothesis is proposed:

H2. EL has a significant positive influence on project members' basic psychological needs satisfaction.

Basic psychological needs satisfaction and individual outcomes

According to SDT, a high level of basic psychological needs satisfaction means that individuals can freely choose to perform actions, effectively deal with challenging tasks, and feel supported and accepted by others, thus stimulating individuals to flourish and

promoting personal well-being (Deci and Ryan, 2000; Costa *et al.*, 2015). On the contrary, a low level of basic psychological needs satisfaction can hinder the growth potential of individuals, and the frustration of SDT needs may cause defensiveness, ill-being and even psychopathology (Chen *et al.*, 2015). It's reasonable to speculate that project members' basic psychological needs satisfaction can promote their well-being at the workplace. In support, many researchers have found that basic psychological needs satisfaction can significantly positively affect people's subjective or psychological well-being (Unanue *et al.*, 2014; Chang *et al.*, 2015; Lin and Chan, 2020). On these grounds, the following hypothesis is proposed:

H3a. Basic psychological needs satisfaction has a significant positive influence on project members' work-related well-being.

When the basic psychological needs of project members are wholly satisfied, it means that the individuals obtain an energetic resource that propels a variety of motivated behaviors, thereby increasing the possibility of implementing citizenship behavior (Vansteenkiste *et al.*, 2010; Wörtler *et al.*, 2020). Specifically, job autonomy is an important antecedent of citizenship behavior (Park, 2016). Project members who feel a sense of self-determination regarding their work may be more likely to freely use their knowledge, skills and abilities, thus eliminating rigid bureaucratic restrictions and engaging more frequently in citizenship behavior (Raub, 2008). In addition, when project members experience a sense of competence, their self-efficacy can also be enhanced, which may make them feel capable of playing a wider range of work roles, thereby engaging in extra-role behavior (Li *et al.*, 2015). The satisfaction of relatedness need can positively affect individuals' emotions, identification, and cognitive processes. As a result, individuals may show spontaneous behaviors that are conducive to the proximal context (e.g. colleagues or leaders) or the distal context (e.g. organizations) in order to maintain a good relationship with the surroundings (Chiniara and Bentein, 2016). Based on the above arguments, the hypothesis could be formulated as follows:

H3b. Basic psychological needs satisfaction has a significant positive influence on project members' project citizenship behavior.

The mediation effects of basic psychological needs satisfaction

As we proposed the relation between empowering leadership and basic psychological needs satisfaction, and the relation between basic psychological needs satisfaction and individual outcomes (work-related well-being and project citizenship behavior), these two relationships are in support for a mediation relationship. The authors use insights from SDT (Ryan and Deci, 2000; Gagné and Deci, 2005) to further advance the understanding of the psychological mechanism through which empowering leadership promotes project members' individual outcomes. As articulated by SDT, when contextual factors meet the individual's basic psychological needs, on the one hand, the individual is more likely to grow and develop in a positive and healthy manner and experience a higher level of well-being. On the other hand, the individual's intrinsic and well-internalized motivation can be maintained and strengthened, and then show more active and proactive behavior (Chiniara and Bentein, 2016; Van den Broeck *et al.*, 2016).

The growing evidence has confirmed the close relationship between basic psychological needs satisfaction and positive individual outcomes (Unanue *et al.*, 2014; Chiniara and Bentein, 2016; Rahmadani *et al.*, 2019). Additionally, more and more leadership researchers use SDT needs to provide explanatory support for the linkages between active constructive leadership styles (e.g. servant leadership: Chiniara and Bentein, 2016; authentic leadership: Leroy *et al.*, 2015) and work-related positive outcomes. As for empowering leadership, Kim and Beehr (2020b) mentioned that empowering leadership transcends the general satisfaction relationship between other leadership styles and basic psychological needs, and is more consistent and

matching with these needs. Therefore, the authors suggest that a series of supportive measures and practices implemented by empowering leadership can wholly meet project members' basic psychological needs, which make them feel physical and mental free, competent, and blended into the surroundings. In turn, basic psychological needs satisfaction acts as an internal drive to promote better well-being and to undertake citizenship behavior. It is logical that empowering leadership can meet the basic psychological needs of project members (i.e. need for autonomy, competence, and relatedness), thereby improving their work-related well-being and stimulating their project citizenship behavior. Therefore, the hypotheses are posited as the following:

H4a. Basic psychological needs satisfaction mediates the positive relationship between empowering leadership and work-related well-being.

H4b. Basic psychological needs satisfaction mediates the positive relationship between empowering leadership and project citizenship behavior.

Work-related well-being and project citizenship behavior
As a positive and stable psychological state that occurs in the workplace, work-related well-being may be closely related to project members' extra-role behaviors. Individuals in a positive emotional state may adopt positive and proactive actions to maintain their emotional state (Rego *et al.*, 2010). Studies show that employees with high levels of work-related well-being are more inclined to help others and are more likely to perform citizenship behavior based on the principle of reciprocity (Rego *et al.*, 2010; Chiu *et al.*, 2015). A recent study also confirms that construction project members who are more satisfied with their work are more willing to actively share their knowledge (Sang *et al.*, 2019). In light of the above-cited literature, we predict that the positive emotional experience and psychological state in the workplace can encourage project members to implement more spontaneous citizenship behavior. Therefore, the following hypothesis is proposed:

H5. Project members' work-related well-being has a significant positive influence on their project citizenship behavior.

The proposed model is as follows (Figure 1).

Research methodology
Sample and data collection
This study used a non-probability convenience sampling method (Cheng *et al.*, 2021). This method is more applicable in the Chinese construction context than the random sampling method, and it does not result in low response rates due to the generally reluctance of Chinese construction professionals to answer questionnaires (Zhang *et al.*, 2018). An electronic questionnaire was adopted for data collection. The content of the questionnaire was supervised by an independent academic committee of China University of Mining and Technology for ethical review. The target respondents of this study were the immediate subordinates of front-line top management, as they worked closely with the on-site senior project managers (e.g. on-site chief of the owner, contractor's project manager, and chief supervision engineer). At the beginning of the questionnaire, participants were informed that this survey was anonymous and that their privacy was protected. In addition, they were provided with a short survey invitation explaining the purpose, the risks, and the questions related to this study. The survey was conducted from October to December 2020. A total of 594 project members were recruited to complete the questionnaire with the help of the alumni association, construction practitioners who had attended project management training at universities, and many industry experts. The samples covered the vast majority of provinces

and municipalities in China (e.g. Beijing, Shanghai, Jiangsu, Shandong, and Guangdong), as well as some overseas construction projects located in Singapore, United Arab Emirates, Saudi Arabia, and Algeria. The respondents involved participants from different project organizations, including the owner, general contractor, subcontractor, supervisor, consultant, and other construction companies in China. There is no sample with missing data due to the complete submission form of the online questionnaire. The authors deleted the questionnaires with the same score on most items, were submitted in a short period of time, and were inconsistent in reverse settings. Finally, there were 435 effective questionnaires and the effective response rate was 73.23%. Table 1 shows the demographic data of respondents.

Measures

The authors followed a standardized process applicable to the survey to ensure the validity of the study and avoid cultural bias (Lin *et al.*, 2018). The items were originally derived from English, with the help of two professors. Direct translation combined with back translation was used for each item in the questionnaire to ensure the translation quality. Furthermore, the authors invited eight construction professionals from different project organizations to conduct a pilot test to eliminate problems in wording and comprehending, and made further modifications based on their feedback to ensure the validity and accuracy of the questionnaire.

Except for individual and project demographics, all items were measured using a 5-point Likert scale (1 = " strongly disagree" 5 = "strongly agree"). Considering that some respondents may participate in two or more projects simultaneously, it was particularly emphasized to score according to the project with the longer/longest time they have been in.

Empowering leadership

A 12-item scale from Ahearne *et al.* (2005) was employed to gauge empowering leadership, including four sub-scales, namely, enhancing the meaningfulness of work, fostering participation in decision making, expressing confidence in high performance, and providing autonomy from bureaucratic constraints. It was emphasized that the project members should refer to the direct leader for scoring. A sample item is: "My leader helps me understand how my objectives and goals relate to that of the project". (Cronbach's $\alpha = 0.942$).

Basic psychological needs satisfaction

Nine items were used to evaluate the three components of basic psychological needs, namely autonomy, competence, and relatedness. The items used for measurement were taken from the short work-related basic psychological needs satisfaction scale (two items for each dimension) developed by Jensen and Bro (2018). On this basis, one item was added for each psychological need referring to Chiniara and Bentein's (2016) basic psychological needs
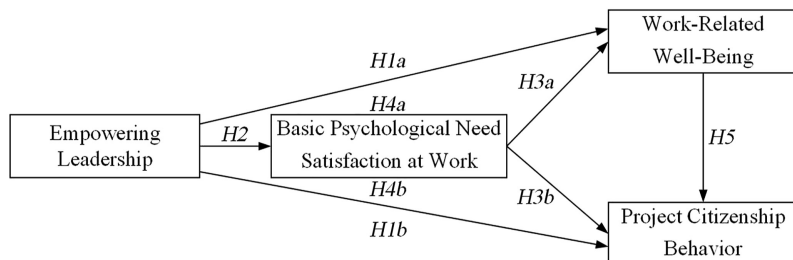
Figure 1.
The proposed model

	Category	Attribute	Count	Percentage (%)
Individual demographics	Gender	Male	361	82.99
		Female	74	17.01
	Age	<25	57	13.10
		25–29	127	29.20
		30–34	112	25.75
		35–39	58	13.33
		≥40	81	18.62
	Education	High school	28	6.44
		Certificate or associate's	95	21.84
		Bachelor's	221	50.80
		Master's or Ph.D	91	20.92
	Tenure (years)	0–5	173	39.77
		6–10	108	24.83
		11–15	79	18.16
		16–20	32	7.35
		≥21	43	9.89
	Project party	Owner	122	28.04
		Contractor	128	29.43
		Agent, consultant, or supervisor	134	30.80
		Others	51	11.73
Project demographics	Project type	Housing construction	292	67.13
		Transport projects	37	8.51
		Municipal engineering	50	11.49
		Others	56	12.87
	Project team size (number of participants)	0–10	162	37.24
		11–20	98	22.53
		21–30	63	14.48
		31–50	35	8.05
		≥51	77	17.70
	Project duration (years)	0–0.5	39	8.97
		0.5–1	55	12.64
		1–3	252	57.93
		3–5	63	14.48
		≥5	26	5.98
	Project investment (million RMB)	<10	40	9.20
		10–50	70	16.09
		50–200	110	25.29
		200–500	82	18.85
		≥500	133	30.57

Table 1.
Summary of
respondents'
demographic
information

satisfaction scale. Each psychological need was measured by three items: autonomy (e.g. "I feel I can make a great deal of input in deciding how my job gets done"); competence (e.g. "I am good at what I do at work"); relatedness (e.g. "I feel connected to the people I work with"). (Cronbach's $\alpha = 0.933$).

Work-related well-being
Using the workplace dimension of the employee well-being scale developed by Zheng *et al.* (2015) in the Chinese context to measure work-related well-being, including six items. Respondents were requested to evaluate personal feelings such as "In general, I feel fairly satisfied with my present job" and "Work is a meaningful experience for me." (Cronbach's $\alpha = 0.909$).

Project citizenship behavior
The three types of project citizenship behavior, namely helping behavior, project-based compliance, and individual initiative, were assessed using nine items from Braun *et al.* (2013) scale (three items for each behavior). Sample items are "I intervene and try to balance interests when disputes in the project team occur" (Helping behavior); "I make the necessary improvements if the critique of my performance is justified" (Project-based compliance) "I propose my own ideas and suggestions in the operative project work, even when it is not explicitly requested" (Individual initiative). The authors used a global measure of project citizenship behavior that is generally accepted, because different types of citizenship behavior are often highly correlated and focusing on a single type of citizenship behavior is little value (Klotz *et al.*, 2018). (Cronbach's $\alpha = 0.912$).

Control variables
Based on the previous literature, the authors set gender, age, education, and tenure as individual-level control variables to isolate their influence on the relationship between research variables (Smith *et al.*, 1983; Zheng *et al.*, 2015; Klotz *et al.*, 2018). In addition, compared with small- and medium-sized projects, large-sized construction projects often face a more dynamic and highly uncertain environment, more diverse stakeholders, and more complex social networks; these contextual factors may have complicated effects on project citizenship behavior (Yang *et al.*, 2018, 2020). Therefore, apart from individual-level control variables, the authors also controlled the potential impact of project scale (including project team size, project duration, and project investment) on the results.

Data analysis methods
The data analysis methods in this study include confirmatory factor analysis (CFA), regression analysis, and bootstrap analysis. We would validate whether the observed variables largely reflect the latent variables and measure the degree of fit of the data to the model based on the CFA results. Meanwhile, we conducted a common method variance test in the process of CFA to ensure the reliability and scientificity of the results of the subsequent data analysis. Regression analysis was used to intuitively interpret the established theoretical model, helping to understand the relationship between variables by calculating the effect values between variables. In the process of the mediation effect test based on hierarchical regression analysis, the bootstrap method was used simultaneously to determine the significance of the mediation. SPSS 26, Process 3.5, and Mplus 8.3 software were used for the above calculation and analysis.

Analysis and results
Confirmatory factor analysis (CFA) and examination of common method variance (CMV)
As all variables were measured from project members, the authors conducted a set of CFAs in Mplus 8.3 to test whether the variables were empirically distinct. As shown in Table 2, except the baseline model ($\chi^2 = 1362.812$, $df = 578$, $\chi^2/df = 2.358$, RMSEA = 0.056, SRMR = 0.048, TLI = 0.933, CFI = 0.938), other alternative models cannot provide a better model fitting. Results show that the baseline model in this study has a good discriminant validity.

Considering that the data collected are from a single source, and there may be potential existence of CMV. According to Podsakoff *et al.* (2003), post hoc statistical strategies were used to determine the presence of CMV. The authors compared the baseline model with the single model. As see in Table 2, the single factor model cannot provide an acceptable model fitting ($\chi^2 = 3219.08$, $df = 819$, $\chi^2/df = 3.931$, RMSEA = 0.116, SRMR = 0.083, TLI = 0.651, CFI = 0.668), which means CMV is not a potential threat in this study. Furthermore, the

unmeasured latent method construct (ULMC) approach with higher testing power was used to further test the CMV (Richardson *et al.*, 2009). Based on the baseline model, a virtual CMV factor that allows all items to be loaded on this factor was constructed. The CFA results show that the model fitting indexes of baseline model incorporating CMV factor has insignificant improvement ($\Delta\chi^2/df = 0.143$, ΔRMSEA = 0.003, ΔSRMR = 0.004, ΔTLI = 0.007, ΔCFI = 0.011). All of these indicate that there is no severe issue of CMV that is sufficient to invalidate the findings for the current study.

Descriptive statistics and correlation analysis
The means, standard deviations, and correlations among variables are shown in Table 3. The correlation between research variables is consistent with the theoretical expectation, which provides a reliable premise for the follow-up analysis. Additionally, the correlation coefficients are lower than 0.85, which can be considered within a reasonable scope (Al-Ghazali, 2020). In addition, taking into account the relatively high correlation coefficient means that there may be a multicollinearity problem in the following regression analyses. The authors calculated the variance inflation factor (VIF) value for each regression equation. The VIF values of variables ranged from 1.019 to 3.588, which are all lower than the recommended threshold of 5 (Wang *et al.*, 2018b). Therefore, the effect of multicollinearity can be ignored in the regression analyses.

Hypotheses testing
A series of hierarchical regression analysis was conducted to test the hypotheses (Baron and Kenny, 1986), and the results are shown in Table 4. H1a and H1b state the separate influence of empowering leadership on work-related well-being and project citizenship behavior. After controlling for gender, age, education, tenure, project team size, project duration, and project investment, empowering leadership is significantly positively correlated with work-related

	χ^2	df	χ^2/df	TLI	CFI	RMSEA	SRMR
Baseline model (EL; BPNS; WWB; PCB)	1362.812	578	2.358	0.933	0.938	0.056	0.048
Triple-factor model (EL; BPNS + WWB; PCB)	2216.042	584	3.795	0.862	0.872	0.080	0.053
Double-factor model (EL + BPNS + WWB; PCB)	3965.559	590	6.721	0.717	0.735	0.115	0.079
Single model (EL + BPNS + WWB + PCB)	4605.230	594	7.753	0.666	0.685	0.125	0.083
Baseline model incorporating CMV factor	1197.354	543	2.205	0.940	0.949	0.053	0.044

Note(s): EL = Empowering Leadership, PIS = Perceived Insider Status, BPNS = Basic Psychological Needs Satisfaction, WWB = Work-related Well-Being, PCB = Project Citizenship Behavior

	Mean	SD	1	2	3	4
1. EL	3.549	0.843	1			
2. BPNS	3.860	0.715	0.661***	1		
3. WWB	3.815	0.768	0.647***	0.766***	1	
4. PCB	3.831	0.680	0.641***	0.797***	0.712***	1

Note(s): N = 435. *p < 0.05, **p < 0.01, ***p < 0.001; EL = Empowering Leadership, PIS = Perceived Insider Status, BPNS = Basic Psychological Needs Satisfaction, WWB = Work-related Well-Being, PCB = Project Citizenship Behavior

	BPNS		WWB			PCB		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Cont	1.674***	1.806***	0.909***	0.725***	1.441***	0.578**	0.433*	0.897***
Gender	−0.074	0.048	0.094	0.096	−0.043	0.000	0.001	−0.091
Age	−0.017	0.035	0.054	0.046	0.009	0.026	0.019	−0.005
Education	−0.002	−0.064	−0.071*	−0.063*	0.060	0.055*	0.061*	0.089**
Tenure	0.088*	0.031	−0.041	−0.025	0.103**	0.038	0.050	0.084**
Project team size	0.006	−0.014	−0.022	−0.018	−0.016	−0.023	−0.020	−0.011
Project duration	−0.012	−0.059	−0.051	−0.051	−0.010	−0.002	−0.002	0.025
Project investment	0.060*	0.059*	0.012	0.020	0.068**	0.026	0.032	0.035
EL	0.549***	0.573***		0.219***	0.503***		0.173***	
BPNS			0.819***	0.646***		0.739***		
WWB							0.602***	0.618***
R^2	0.467	0.443	0.604	0.636	0.463	0.651	0.676	0.541
Adjusted R^2	0.457	0.433	0.596	0.628	0.453	0.644	0.669	0.533
F-Value	46.712***	42.380***	81.081***	82.346***	45.865***	99.174***	98.566***	62.826***
Bootstrap				0.290, 0.425			0.273, 0.391	

Note(s): $N = 435$. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; EL = Empowering Leadership, PIS = Perceived Insider Status, BPNS = Basic Psychological Needs Satisfaction, WWB = Work-related Well-Being, PCB = Project Citizenship Behavior

Table 4.
Results of Multivariate regression

well-being and project citizenship behavior (Model 2, $B = 0.573$, $p < 0.001$; Model 5, $B = 0.503$, $p < 0.001$), thus H1a and H1b are empirically supported.

H2 suggests that empowering leadership has a significant positive influence on basic psychological needs satisfaction. The regression result indicates that empowering leadership is positively related to basic psychological needs satisfaction (Model 1, $B = 0.549$, $p < 0.001$), supporting H2.

H3a and H3b are related to the separate effect of basic psychological needs satisfaction on work-related well-being and project citizenship behavior. Based on the regression analysis results, have a significant positive impact on work-related well-being and project citizenship behavior respectively (Model 3, $B = 0.819$, $p < 0.001$; Model 6, $B = 0.739$, $p < 0.001$), thus H3a and H3b are supported.

H4a and H4b pertain to the mediating effects of basic psychological needs satisfaction. To test H4a, the regression result shows that empowering leadership and basic psychological needs satisfaction are significantly positively correlated (Model 1, $B = 0.549$, $p < 0.001$), and then empowering leadership and basic psychological needs satisfaction were incorporated into the regression model with work-related well-being as the dependent variable, the influence of empowering leadership on work-related well-being is reduced from 0.573 to 0.219 (Model 4, $B = 0.219$, $p < 0.001$), while basic psychological needs satisfaction still has a significant positive impact on work-related well-being (Model 4, $B = 0.646$, $p < 0.001$). According to Baron and Kenny (1986), it can be concluded that basic psychological needs satisfaction plays a partial mediating role between empowering leadership and work-related well-being. For H4b, based on the regression analysis results, empowering leadership and basic psychological needs satisfaction are significantly positively correlated (Model 1, $B = 0.549$, $p < 0.001$). After empowering leadership and basic psychological needs satisfaction were incorporated into the regression model with project citizenship behavior as the dependent variable, the results show that the influence of empowering leadership on project citizenship behavior change from 0.503 to 0.173 (Model 7, $B = 0.173$, $p < 0.001$), and the positive impact of basic psychological needs satisfaction on project citizenship behavior is still significant (Model 7, $B = 0.602$, $p < 0.001$). Therefore, work-related well-being also has a partial mediating effect between empowering leadership and project citizenship behavior. In addition, the authors used Sobel test (1982) to analyze the mediating effects of basic psychological needs satisfaction between empowering leadership and individual outcomes (work-related well-being and project citizenship behavior) ($Z = 11.612$, $p < 0.001$; $Z = 12.345$, $p < 0.001$), thus supporting H4a and H4b.

To further test H4a and H4b, viz., the mediation effect of basic psychological needs satisfaction, the authors applied bootstrap methods to conduct mediation analysis using Hayes macro PROCESS (Hayes, 2013). Based on 5,000 bootstrap samples and 95% percentile confidence intervals (CIs), zero is not including in the 95% confidence intervals (Model 4, [0.290, 0.425]; Model 7, [0.273, 0.391]), thus H4a and H4b are further supported.

For H5, viz., the positive effect of work-related well-being on project citizenship behavior. The result shows that work-related well-being has a positive association relationship with project citizenship behavior (Model 8, $B = 0.618$, $p < 0.001$), which supports H5.

Discussion and conclusions

The purpose of this study was to explore how empowering leadership influences project members' individual outcomes, more precisely work-related well-being and project citizenship behavior. In the constructed theoretical model, we explored basic psychological needs satisfaction as a mediator between the above relationship in the context of SDT; meanwhile, we further established the link between project members' work-related well-being and project

citizenship behavior based on the happy productive worker thesis. The empirical data supported the model and the hypothesized relationships. The conclusions are detailed below.

First, the results show that empowering leadership is positively related to project members' work-related well-being and project citizenship behavior. This indicates that empowering leadership has a proximal impact on project members' individual outcomes. Project members who are empowered by their superiors can sustain the best psychological function and improve their intrinsic work motivation, which in turn promotes their well-being and citizenship behaviors. The present findings, together with previous meta-analysis results of employee responses to empowering leadership (Kim *et al.*, 2018b), highlight the positive impacts of empowering leadership on subordinates' psychological state and internal work motivation.

Second, this study further investigates how empowering leadership affects project members' individual outcomes. The results provide evidence that basic psychological needs satisfaction mediates the effect of empowering leadership on work-related well-being and project citizenship behavior. Empowering leadership is a supportive leadership paradigm that enables project members to experience a sense of control and self-determination over their actions (autonomy need), a sense of mastery and empowerment (competence need), and a sense of connectedness and respect with others (relatedness need). Satisfaction of these three needs can, in turn, foster project members' work-related well-being and motivate them to implement positive extra-role behaviors. In a nutshell, empowering leadership fosters the basic psychological needs that lead to job well-being and project citizenship behaviors. The present results resonate with Kim and Beehr's (2020b) argument that empowering leadership is a solid match for the SDT needs. Also, the results support the view that basic psychological needs satisfaction is an important foundation for well-being and proactive behavior as perceived by SDT.

Third, this study concluded that project members' well-being positively predicted their citizenship behavior. Work-Related well-being is a dynamic process that requires sustained effort and investment by both the individual and the organization. On the one hand, positive experiences such as work satisfaction and pride derived from work-related well-being can cultivate employees' emotional and work engagement, and encourage them to take more positive behaviors beyond job descriptions or formal contracts. On the other hand, citizenship behaviors can be seen as a reciprocal action of project members after they gain work-related well-being.

Theoretical implications

Empowering leadership is increasingly prevalent in the leadership literature, with most studies attempting to investigate its potential effects within traditional or permanent organizations (e.g. Kim *et al.*, 2018a; Fong and Snape, 2015; Li *et al.*, 2016; Lin and Chan, 2020), while its influence in temporary organizations such as construction projects is left largely unexplored. This study provides compelling evidence for the relationship between empowering leadership and individual outcomes (i.e. work-related well-being and project citizenship behavior) in construction projects, thus expanding the research scope and outcomes of empowering leadership. The findings of this study also complement empowering leadership as a leader-level workplace resource to improve both employee well-being and performance (Nielsen *et al.*, 2017). The present study empirically validates the effectiveness of empowering leadership in construction projects, responds to the call for more empirical research on applying empowerment theory in the construction projects context (Kim and Rhee, 2020), and echoes Ding *et al.*'s (2017) suggestion to test more positive leadership styles in temporary organizations.

Second, this study sheds more light on why empowering leadership affects the individual outcomes of project members. Drawing insights from SDT, the present study provides evidence that empowering leadership meets individuals' basic psychological needs leading to

work-related well-being and project citizenship behavior. Consistent with SDT, the results support the view that the satisfaction of individuals' basic psychological needs is one of the conditions for well-being and proactive behavior (Deci and Ryan, 2000; Unanue *et al.*, 2014; Costa *et al.*, 2015; Chang *et al.*, 2015; Lin and Chan, 2020). This study uses the SDT to construct the overall logic between the research variables. From another alternative perspective (i.e. self-determination), the present study provides new insights to explain how empowering leadership affects individual outcomes, and widens the scope of the psychological consequences of empowering leadership.

Third, the present study also enriches the literature on employee well-being in the construction context by enhancing our understanding of the utility of work-related well-being. Previous research on well-being in the construction contexts has mainly emphasized its antecedents (e.g. Chen *et al.*, 2020). The results highlight a positive link between project members' work-related well-being and their citizenship behaviors, which is consistent with happy productive worker thesis (Wright and Cropanzano, 2000). This finding, thus, adds to prior studies in other industries (Gore *et al.*, 2014; Turban and Yan, 2016; Xu *et al.*, 2019) and highlights the importance of improving employee well-being through management practices in temporary organizational contexts.

Practical implications
First, this study reveals that projects implementing empowering leadership could experience many positive implications, especially at the micro level. Considering that innate elements such as personality traits and character of leaders can be evident in their daily behavior, which may have an important impact on their leadership style. It is recommended that project-based organizations can prioritize these low-control, low-power distance personnel when appointing front-line leaders. In addition to considering the qualifications of front-line leaders, empowerment training and mentoring are equally essential as acquired processes (Zheng *et al.*, 2022). It is worth noting that although empowering leadership is often seen as an effective leadership paradigm, it is not always beneficial. For example, in the early stages of a project, it's difficult for leaders to develop optimal rapport with subordinates. This can make it difficult to align the leader's empowerment practices with subordinates' expectations, which leads subordinates to negatively interpret empowering leadership as laissez-faire leadership (Wong and Giessner, 2018). In this case, team members are more dependent on role clarification and defined instructions to take action to advance goals (Lorinkova *et al.*, 2013). So before empowering, project leaders need to fully consider the current stage of team development, interpersonal relationships with subordinates, and the level of acceptance and readiness of different subordinates to empowerment, and then develop targeted and differentiated empowerment strategies.

Second, the present study illustrates that basic psychological needs are an important psychological resource that plays a key role in the workplace, fostering individuals' optimal psychological functioning and intrinsic motivation. In this vein, leaders and organizations need to change the production-oriented project management mindset and recognize that employees have psychological needs for autonomy, competence, and relatedness. Specifically, the bureaucracy and red tape common to construction projects make employees reluctant to think and act "outside the box." We recommend that organizations and leaders do not interfere too much with project members' actions without interfering with project goals, while encouraging their participation in the project decision-making process. Additionally, compared to permanent organizations, project success requires coordination and cooperation among employees with different skills and knowledge (Sang *et al.*, 2021). With a high level of reliance on team members, project leaders should fully acknowledge team members' perspectives and opinions while accommodating their failures as much as possible. Project leaders also need to

dynamically adjust specific work schedules based on actual project changes to ensure that the assigned tasks match employees' resources and skills. In addition, a construction project, as a typical form of temporary organization, usually involves participants from different construction enterprises and related parties. Identity differences among employees may contribute to group differentiation and antagonism within the project. Consequently, it is a necessity to meet employees' relatedness needs by cultivating a harmonious project atmosphere and high-quality leader-subordinate and colleague relationships.

Third, organizations and leaders should deepen their understanding of the utility of employee well-being in the workplace, within construction projects context. The improved work-related well-being of project employees drives them to take personal action to achieve project success, which is obviously a win-win situation. However, at present, project employees are generally under tremendous stress and often experience mental health problems such as depression or anxiety (Wang *et al.*, 2022). In response, project-based organizations should implement programs to enhance well-being at work, such as holding regular talks, increasing compensation and benefits, and reconciling work-family conflicts. In summary, keeping abreast of project members' psychological states in the work environment and providing diverse support, breaks, recreation, and counseling may lead to higher individual outcomes.

Limitations and future research directions

The present study also has some limitations which are worth mentioning and can be rectified in future research. First, this study adopted a cross-sectional design. The data collected can only describe a certain point in time, and cannot well reflect dynamic changes. In this regard, further consideration can be given to longitudinal research on data collection to reveal causality and dynamic impact mechanism. Second, this study adopted a self-report form to measure the research variables, which is reasonable to some extent, because all constructs are essentially dependent on individual subjective perception. For instance, leaders and colleagues cannot observe project members' project citizenship behavior at any time, and according to the meta-analysis of Carpenter *et al.* (2014), the actual difference between self-reported and other-reported organizational citizenship behavior is quite small. For the problem of common method biases that may exist due to self-reporting, we took necessary pre-measures (e.g. creating reverse-scored items, anonymizing respondents), and conducted post hoc statistical strategies to evaluate CMV (Podsakoff *et al.*, 2003; Richardson *et al.*, 2009). Still, future research can try to use multiple sources of data collection or more objective scoring methods. Third, the authors strategically chose work-related well-being and project citizenship behavior to reflect individual-level outcomes and examined the effectiveness of empowering leadership in the context of Chinese culture. In the future, researchers can expand the choice associated with project success to incorporate a broader range of outcomes, and validate the effectiveness of empowering leadership in other cultural contexts. Fourth, given the diversity of organizations and regions sampled, the heterogeneity of the sample in this study is relatively large. This means that the current findings are unlikely to be influenced by project-specific organizations and regions and are somewhat generalizable. However, this also precludes the possibility that the findings are organization- or region-specific experiences. It is suggested that future researchers can explore the specific effects of empowering leadership in different project organizations or regions.

References

Aga, D.A., Noorderhaven, N. and Vallejo, B. (2016), "Transformational leadership and project success: the mediating role of team-building", *International Journal of Project Management*, Vol. 34 No. 5, pp. 806-818.

Ahearne, M., Mathieu, J. and Rapp, A. (2005), "To empower or not to empower your sales force? An empirical examination of the influence of leadership empowerment behavior on customer satisfaction and performance", *Journal of Applied Psychology*, Vol. 90 No. 5, pp. 945-955.

Al-Ghazali, B.M. (2020), "Transformational leadership, career adaptability, job embeddedness and perceived career success: a serial mediation model", *Leadership and Organization Development Journal*, Vol. 41 No. 8, pp. 993-1013.

Amundsen, S. and Martinsen, Ø.L. (2014), "Empowering leadership: construct clarification, conceptualization, and validation of a new scale", *The Leadership Quarterly*, Vol. 25 No. 3, pp. 487-511.

Amundsen, S. and Martinsen, Ø.L. (2015), "Linking empowering leadership to job satisfaction, work effort, and creativity: the role of self-leadership and psychological empowerment", *Journal of Leadership and Organizational Studies*, Vol. 22 No. 3, pp. 304-323.

Arnold, J.A., Arad, S., Rhoades, J.A. and Drasgow, F. (2000), "The empowering leadership questionnaire: the construction and validation of a new scale for measuring leader behaviors", *Journal of Organizational Behavior*, Vol. 21 No. 3, pp. 249-269.

Auh, S., Menguc, B. and Jung, Y.S. (2014), "Unpacking the relationship between empowering leadership and service-oriented citizenship behaviors: a multilevel approach", *Journal of the Academy of Marketing Science*, Vol. 42 No. 5, pp. 558-579.

Avey, J.B., Luthans, F. and Youssef, C.M. (2010), "The additive value of positive psychological capital in predicting work attitudes and behaviors", *Journal of Management*, Vol. 36 No. 2, pp. 430-452.

Baron, R.M. and Kenny, D.A. (1986), "The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations", *Journal of Personality and Social Psychology*, Vol. 51 No. 6, pp. 1173-1182.

Braun, T., Müller-Seitz, G. and Sydow, J. (2012), "Project citizenship behavior?–An explorative analysis at the project-network-nexus", *Scandinavian Journal of Management*, Vol. 28 No. 4, pp. 271-284.

Braun, T., Ferreira, A.I. and Sydow, J. (2013), "Citizenship behavior and effectiveness in temporary organizations", *International Journal of Project Management*, Vol. 31 No. 6, pp. 862-876.

Carpenter, N.C., Berry, C.M. and Houston, L. (2014), "A meta-analytic comparison of self-reported and other-reported organizational citizenship behavior", *Journal of Organizational Behavior*, Vol. 35 No. 4, pp. 547-574.

Chang, J.H., Huang, C.L. and Lin, Y.C. (2015), "Mindfulness, basic psychological needs fulfillment, and well-being", *Journal of Happiness Studies*, Vol. 16 No. 5, pp. 1149-1162.

Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E.L., der Kaap-Deeder, V. and Verstuyf, J. (2015), "Basic psychological need satisfaction, need frustration, and need strength across four cultures", *Motivation and Emotion*, Vol. 39 No. 2, pp. 216-236.

Chen, Y., Zhang, F., Wang, Y. and Zheng, J. (2020), "Work–family conflict, emotional responses, workplace deviance, and well-being among construction professionals: a sequential mediation model", *International Journal of Environmental Research and Public Health*, Vol. 17 No. 18, p. 6883.

Cheng, M., Liu, G. and Xu, Y. (2021), "Can joint-contract functions promote PPP project sustainability performance? A moderated mediation model", *Engineering, Construction and Architectural Management*, Vol. 28 No. 9, pp. 2667-2689.

Cheong, M., Yammarino, F.J., Dionne, S.D., Spain, S.M. and Tsai, C.Y. (2019), "A review of the effectiveness of empowering leadership", *The Leadership Quarterly*, Vol. 30 No. 1, pp. 34-58.

Chiniara, M. and Bentein, K. (2016), "Linking servant leadership to individual performance: differentiating the mediating role of autonomy, competence and relatedness need satisfaction", *The Leadership Quarterly*, Vol. 27 No. 1, pp. 124-141.

Chiu, C.M., Huang, H.Y., Cheng, H.L. and Sun, P.C. (2015), "Understanding online community citizenship behaviors through social support and social identity", *International Journal of Information Management*, Vol. 35 No. 4, pp. 504-519.

Choi, J.N. (2007), "Change-oriented organizational citizenship behavior: effects of work environment characteristics and intervening psychological processes", *Journal of Organizational Behavior*, Vol. 28 No. 4, pp. 467-484.

Conger, J.A. and Kanungo, R.N. (1988), "The empowerment process: integrating theory and practice", *Academy of Management Review*, Vol. 13 No. 3, pp. 471-482.

Costa, S., Ntoumanis, N. and Bartholomew, K.J. (2015), "Predicting the brighter and darker sides of interpersonal relationships: does psychological need thwarting matter?", *Motivation and Emotion*, Vol. 39 No. 1, pp. 11-24.

Dagenais-Desmarais, V. and Savoie, A. (2012), "What is psychological well-being, really? A grassroots approach from the organizational sciences", *Journal of Happiness Studies*, Vol. 13 No. 4, pp. 659-684.

Deci, E.L. and Ryan, R.M. (2000), "The "what" and "why" of goal pursuits: human needs and the self-determination of behavior", *Psychological Inquiry*, Vol. 11 No. 4, pp. 227-268.

Ding, X., Li, Q., Zhang, H., Sheng, Z. and Wang, Z. (2017), "Linking transformational leadership and work outcomes in temporary organizations: a social identity approach", *International Journal of Project Management*, Vol. 35 No. 4, pp. 543-556.

Ferreira, A.I., Braun, T. and Sydow, J. (2013), "Citizenship behavior in project-based organizing: comparing German and Portuguese project managers", *The International Journal of Human Resource Management*, Vol. 24 No. 20, pp. 3772-3793.

Fisher, C.D. (2010), "Happiness at work", *International Journal of Management Reviews*, Vol. 12 No. 4, pp. 384-412.

Fong, K.H. and Snape, E. (2015), "Empowering leadership, psychological empowerment and employee Outcomes: testing a multi-level mediating model", *British Journal of Management*, Vol. 26 No. 1, pp. 126-138.

Gagné, M. and Deci, E.L. (2005), "Self-determination theory and work motivation", *Journal of Organizational Behavior*, Vol. 26 No. 4, pp. 331-362.

Ghitulescu, B.E. (2018), "Psychosocial effects of proactivity: the interplay between proactive and collaborative behavior", *Personnel Review*, Vol. 47 No. 2, pp. 294-318.

Gore, J.S., Davis, T., Spaeth, G., Bauer, A., Loveland, J.M. and Palmer, J.K. (2014), "Subjective well-being predictors of academic citizenship behavior", *Psychological Studies*, Vol. 59 No. 3, pp. 299-308.

Grant, A.M., Christianson, M.K. and Price, R.H. (2007), "Happiness, health, or relationships? Managerial practices and employee well-being tradeoffs", *Academy of Management Perspectives*, Vol. 21 No. 3, pp. 51-63.

Hayes, A.F. (2013), *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*, Guilford Press, New York, NY.

Humborstad, S.I.W., Nerstad, C.G. and Dysvik, A. (2014), "Empowering leadership, employee goal orientations and work performance: a competing hypothesis approach", *Personnel Review*, Vol. 43 No. 2, pp. 246-271.

Imam, H. (2021), "Roles of shared leadership, autonomy, and knowledge sharing in construction project success", *Journal of Construction Engineering and Management*, Vol. 147 No. 7, 04021067.

Imam, H. and Zaheer, M.K. (2021), "Shared leadership and project success: the roles of knowledge sharing, cohesion and trust in the team", *International Journal of Project Management*, Vol. 39 No. 5, pp. 463-473.

Jensen, U.T. and Bro, L.L. (2018), "How transformational leadership supports intrinsic motivation and public service motivation: the mediating role of basic need satisfaction", *The American Review of Public Administration*, Vol. 48 No. 6, pp. 535-549.

Jiang, M., Wang, H. and Li, M. (2019), "Linking empowering leadership and organizational citizenship behavior toward environment: the role of psychological ownership and future time perspective", *Frontiers in Psychology*, Vol. 10, p. 2612.

Keltner, D., Gruenfeld, D.H. and Anderson, C. (2003), "Power, approach, and inhibition", *Psychological Review*, Vol. 110 No. 2, pp. 265-284.

Kim, M. and Beehr, T.A. (2018a), "Organization-based self-esteem and meaningful work mediate effects of empowering leadership on employee behaviors and well-being", *Journal of Leadership and Organizational Studies*, Vol. 25 No. 4, pp. 385-398.

Kim, M. and Beehr, T.A. (2018b), "Can empowering leaders affect subordinates' well-being and careers because they encourage subordinates' job crafting behaviors?", *Journal of Leadership and Organizational Studies*, Vol. 25 No. 2, pp. 184-196.

Kim, M. and Beehr, T.A. (2020a), "Empowering leadership: leading people to be present through affective organizational commitment?", *The International Journal of Human Resource Management*, Vol. 31 No. 16, pp. 2017-2044.

Kim, M. and Beehr, T.A. (2020b), "The long reach of the leader: can empowering leadership at work result in enriched home lives?", *Journal of Occupational Health Psychology*, Vol. 25 No. 3, pp. 203-213.

Kim, Y.W. and Rhee, B.D. (2020), "The impact of empowering front-line managers on planning reliability and project schedule performance", *Journal of Management in Engineering*, Vol. 36 No. 3, 04020004.

Kim, D., Moon, C.W. and Shin, J. (2018a), "Linkages between empowering leadership and subjective well-being and work performance via perceived organizational and co-worker support", *Leadership and Organization Development Journal*, Vol. 39 No. 7, pp. 844-858.

Kim, M., Beehr, T.A. and Prewett, M.S. (2018b), "Employee responses to empowering leadership: a meta-analysis", *Journal of Leadership and Organizational Studies*, Vol. 25 No. 3, pp. 257-276.

Klotz, A.C., Bolino, M.C., Song, H. and Stornelli, J. (2018), "Examining the nature, causes, and consequences of profiles of organizational citizenship behavior", *Journal of Organizational Behavior*, Vol. 39 No. 5, pp. 629-647.

Konczak, L.J., Stelly, D.J. and Trusty, M.L. (2000), "Defining and measuring empowering leader behaviors: development of an upward feedback instrument", *Educational and Psychological Measurement*, Vol. 60 No. 2, pp. 301-313.

Langdon, R.R. and Sawang, S. (2018), "Construction workers' well-being: what leads to depression, anxiety, and stress?", *Journal of Construction Engineering and Management*, Vol. 144 No. 2, 04017100.

Larsson, J., Eriksson, P.E., Olofsson, T. and Simonsson, P. (2015), "Leadership in civil engineering: effects of project managers' leadership styles on project performance", *Journal of Management in Engineering*, Vol. 31 No. 6, 04015011.

Lee, A., Willis, S. and Tian, A.W. (2018), "Empowering leadership: a meta-analytic examination of incremental contribution, mediation, and moderation", *Journal of Organizational Behavior*, Vol. 39 No. 3, pp. 306-325.

Leroy, H., Anseel, F., Gardner, W.L. and Sels, L. (2015), "Authentic leadership, authentic followership, basic need satisfaction, and work role performance: a cross-level study", *Journal of Management*, Vol. 41 No. 6, pp. 1677-1697.

Li, S.L., He, W., Yam, K.C. and Long, L.R. (2015), "When and why empowering leadership increases followers' taking charge: a multilevel examination in China", *Asia Pacific Journal of Management*, Vol. 32 No. 3, pp. 645-670.

Li, M., Liu, W., Han, Y. and Zhang, P. (2016), "Linking empowering leadership and change-oriented organizational citizenship behavior", *Journal of Organizational Change Management*, Vol. 29 No. 5, pp. 732-750.

Li, N., Chiaburu, D.S. and Kirkman, B.L. (2017), "Cross-level influences of empowering leadership on citizenship behavior: organizational support climate as a double-edged sword", *Journal of Management*, Vol. 43 No. 4, pp. 1076-1102.

Lim, B.T. and Loosemore, M. (2017), "The effect of inter-organizational justice perceptions on organizational citizenship behaviors in construction projects", *International Journal of Project Management*, Vol. 35 No. 2, pp. 95-106.

Lin, L. and Chan, H.W. (2020), "The associations between happiness motives and well-being in China: the mediating role of psychological need satisfaction and frustration", *Frontiers in Psychology*, Vol. 11, p. 2198.

Lin, H., Sui, Y., Ma, H., Wang, L. and Zeng, S. (2018), "CEO narcissism, public concern, and megaproject social responsibility: moderated mediating examination", *Journal of Management in Engineering*, Vol. 34 No. 4, 04018018.

Lorinkova, N.M., Pearsall, M.J. and Sims, H.P. Jr. (2013), "Examining the differential longitudinal performance of directive versus empowering leadership in teams", *Academy of Management Journal*, Vol. 56 No. 2, pp. 573-596.

Luo, L., Zhang, L., Zheng, X. and Wu, G. (2022), "A hybrid approach for investigating impacts of leadership dynamics on project performance", *Engineering, Construction and Architectural Management*, Vol. 29 No. 5, pp. 1965-1990.

Mostert, K., Peeters, M. and Rost, I. (2011), "Work–home interference and the relationship with job characteristics and well-being: a South African study among employees in the construction industry", *Stress and Health*, Vol. 27 No. 3, pp. e238-e251.

Müller, R., Zhu, F., Sun, X., Wang, L. and Yu, M. (2018), "The identification of temporary horizontal leaders in projects: the case of China", *International Journal of Project Management*, Vol. 36 No. 1, pp. 95-107.

Nauman, S., Khan, A.M. and Ehsan, N. (2010), "Patterns of empowerment and leadership style in project environment", *International Journal of Project Management*, Vol. 28 No. 7, pp. 638-649.

Ni, G., Zhu, Y., Zhang, Z., Qiao, Y., Li, H., Xu, N., Deng, Y., Yuan, Z. and Wang, W. (2020), "Influencing mechanism of job satisfaction on safety behavior of new generation of construction workers based on Chinese context: the mediating roles of work engagement and safety knowledge sharing", *International Journal of Environmental Research and Public Health*, Vol. 17 No. 22, p. 8361.

Nielsen, K., Nielsen, M.B., Ogbonnaya, C., Känsälä, M., Saari, E. and Isaksson, K. (2017), "Workplace resources to improve both employee well-being and performance: a systematic review and meta-analysis", *Work and Stress*, Vol. 31 No. 2, pp. 101-120.

Organ, D.W. (1988), *Organizational Citizenship Behavior: The Good Soldier Syndrome*, The Free Press, Lexington.

Park, R. (2016), "Autonomy and citizenship behavior: a moderated mediation model", *Journal of Managerial Psychology*, Vol. 31 No. 1, pp. 280-295.

Park, J.G., Kim, J.S., Yoon, S.W. and Joo, B.K. (2017), "The effects of empowering leadership on psychological well-being and job engagement", *Leadership and Organization Development Journal*, Vol. 38 No. 3, pp. 350-367.

Podsakoff, P.M., MacKenzie, S.B., Paine, J.B. and Bachrach, D.G. (2000), "Organizational citizenship behaviors: a critical review of the theoretical and empirical literature and suggestions for future research", *Journal of Management*, Vol. 26 No. 3, pp. 513-563.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology*, Vol. 88 No. 5, pp. 879-903.

Podsakoff, N.P., Podsakoff, P.M., MacKenzie, S.B., Maynes, T.D. and Spoelma, T.M. (2014), "Consequences of unit-level organizational citizenship behaviors: a review and

recommendations for future research", *Journal of Organizational Behavior*, Vol. 35 No. S1, pp. S87-S119.

Rahmadani, V.G., Schaufeli, W.B., Ivanova, T.Y. and Osin, E.N. (2019), "Basic psychological need satisfaction mediates the relationship between engaging leadership and work engagement: a cross-national study", *Human Resource Development Quarterly*, Vol. 30 No. 4, pp. 453-471.

Raub, S. (2008), "Does bureaucracy kill individual initiative? The impact of structure on organizational citizenship behavior in the hospitality industry", *International Journal of Hospitality Management*, Vol. 27 No. 2, pp. 179-186.

Raziq, M.M., Borini, F.M., Malik, O.F., Ahmad, M. and Shabaz, M. (2018), "Leadership styles, goal clarity, and project success: evidence from project-based organizations in Pakistan", *Leadership and Organization Development Journal*, Vol. 39 No. 2, pp. 309-323.

Rego, A., Ribeiro, N. and Cunha, M.P. (2010), "Perceptions of organizational virtuousness and happiness as predictors of organizational citizenship behaviors", *Journal of Business Ethics*, Vol. 93 No. 2, pp. 215-235.

Richardson, H.A., Simmering, M.J. and Sturman, M.C. (2009), "A tale of three perspectives: examining post hoc statistical techniques for detection and correction of common method variance", *Organizational Research Methods*, Vol. 12 No. 4, pp. 762-800.

Ryan, R.M. and Deci, E.L. (2000), "Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being", *American Psychologist*, Vol. 55 No. 1, pp. 68-78.

Sang, L., Xia, D., Ni, G., Cui, Q., Wang, J. and Wang, W. (2019), "Influence mechanism of job satisfaction and positive affect on knowledge sharing among project members", *Engineering, Construction and Architectural Management*, Vol. 27 No. 1, pp. 245-269.

Sang, L., Yu, M., Lin, H., Zhang, Z. and Jin, R. (2021), "Big data, technology capability and construction project quality: a cross-level investigation", *Engineering, Construction and Architectural Management*, Vol. 28 No. 3, pp. 706-727.

Sharma, P.N. and Kirkman, B.L. (2015), "Leveraging leaders: a literature review and future lines of inquiry for empowering leadership research", *Group and Organization Management*, Vol. 40 No. 2, pp. 193-237.

Smith, C.A., Organ, D.W. and Near, J.P. (1983), "Organizational citizenship behavior: its nature and antecedents", *Journal of Applied Psychology*, Vol. 68 No. 4, pp. 653-663.

Srivastava, A., Bartol, K.M. and Locke, E.A. (2006), "Empowering leadership in management teams: effects on knowledge sharing, efficacy, and performance", *Academy of Management Journal*, Vol. 49 No. 6, pp. 1239-1251.

Tabassi, A.A., Roufechaei, K.M., Bakar, A.H.A. and Yusof, N.A. (2017), "Linking team condition and team performance: a transformational leadership approach", *Project Management Journal*, Vol. 48 No. 2, pp. 22-38.

Terhorst, A., Lusher, D., Bolton, D., Elsum, I. and Wang, P. (2018), "Tacit knowledge sharing in open innovation projects", *Project Management Journal*, Vol. 49 No. 4, pp. 5-19.

Testa, F., Corsini, F., Gusmerotti, N.M. and Iraldo, F. (2020), "Predictors of organizational citizenship behavior in relation to environmental and health and safety issues", *The International Journal of Human Resource Management*, Vol. 31 No. 13, pp. 1705-1738.

Thomas, K.W. and Velthouse, B.A. (1990), "Cognitive elements of empowerment: an "interpretive" model of intrinsic task motivation", *Academy of Management Review*, Vol. 15 No. 4, pp. 666-681.

Toor, S. and Ofori, G. (2008), "Leadership for future construction industry: agenda for authentic leadership", *International Journal of Project Management*, Vol. 26 No. 6, pp. 620-630.

Turban, D.B. and Yan, W. (2016), "Relationship of eudaimonia and hedonia with work outcomes", *Journal of Managerial Psychology*, Vol. 31 No. 6, pp. 1006-1020.

Turner, R., Huemann, M. and Keegan, A. (2008), "Human resource management in the project-oriented organization: employee well-being and ethical treatment", *International Journal of Project Management*, Vol. 26 No. 5, pp. 577-585.

Unanue, W., Dittmar, H., Vignoles, V.L. and Vansteenkiste, M. (2014), "Materialism and well–being in the UK and Chile: basic need satisfaction and basic need frustration as underlying psychological processes", *European Journal of Personality*, Vol. 28 No. 6, pp. 569-585.

Van den Broeck, A., Ferris, D.L., Chang, C.H. and Rosen, C.C. (2016), "A review of self-determination theory's basic psychological needs at work", *Journal of Management*, Vol. 42 No. 5, pp. 1195-1229.

Van Dierendonck, D., Haynes, C., Borrill, C. and Stride, C. (2004), "Leadership behavior and subordinate well-being", *Journal of Occupational Health Psychology*, Vol. 9 No. 2, pp. 165-175.

Vansteenkiste, M., Niemiec, C.P. and Soenens, B. (2010), "The development of the five mini-theories of self-determination theory: an historical overview, emerging trends, and future directions", in Urdan, T.C. and Karabenick, S.A. (Eds), *The Decade Ahead: Theoretical Perspectives on Motivation and Achievement Advances in Motivation and Achievement*, Emerald Group Publishing, Bingley, Vol. 16 Part A, pp. 105-165.

Vansteenkiste, M., Ryan, R.M. and Soenens, B. (2020), "Basic psychological need theory: advancements, critical themes, and future directions", *Motivation and Emotion*, Vol. 44, pp. 1-31.

Wang, G., He, Q., Meng, X., Locatelli, G., Yu, T. and Yan, X. (2017), "Exploring the impact of megaproject environmental responsibility on organizational citizenship behaviors for the environment: a social identity perspective", *International Journal of Project Management*, Vol. 35 No. 7, pp. 1402-1414.

Wang, G., He, Q., Xia, B., Meng, X. and Wu, P. (2018a), "Impact of institutional pressures on organizational citizenship behaviors for the environment: evidence from megaprojects", *Journal of Management in Engineering*, Vol. 34 No. 5, 04018028.

Wang, D., Wang, X. and Xia, N. (2018b), "How safety-related stress affects workers' safety behavior: the moderating role of psychological capital", *Safety Science*, Vol. 103, pp. 247-259.

Wang, W., Fu, Y., Gao, J., Shang, K., Gao, S., Xing, J., Ni, G., Yuan, Z., Qiao, Y. and Mi, L. (2021), "How the COVID-19 outbreak affected organizational citizenship behavior in emergency construction megaprojects: case study from two emergency hospital projects in Wuhan, China", *Journal of Management in Engineering*, Vol. 37 No. 3, 04021008.

Wang, L., Jiang, M., Zhu, F. and Song, P. (2022), "Untangling employee well-being in projects: a configural analysis of job stressors and psychological needs", *Journal of Management in Engineering*, Vol. 38 No. 4, 04022026.

Wörtler, B., Van Yperen, N.W. and Barelds, D.P. (2020), "Do individual differences in need strength moderate the relations between basic psychological need satisfaction and organizational citizenship behavior?", *Motivation and Emotion*, Vol. 44 No. 2, pp. 315-328.

Wong, S.I. and Giessner, S.R. (2018), "The thin line between empowering and laissez-faire leadership: an expectancy-match perspective", *Journal of Management*, Vol. 44 No. 2, pp. 757-783.

Wright, T.A. and Cropanzano, R. (2000), "Psychological well-being and job satisfaction as predictors of job performance", *Journal of Occupational Health Psychology*, Vol. 5 No. 1, pp. 84-94.

Xanthopoulou, D., Bakker, A.B. and Ilies, R. (2012), "Everyday working life: explaining within-person fluctuations in employee well-being", *Human Relations*, Vol. 65 No. 9, pp. 1051-1069.

Xia, N., Zhong, R., Wang, X. and Tiong, R. (2018), "Cross-domain negative effect of work-family conflict on project citizenship behavior: study on Chinese project managers", *International Journal of Project Management*, Vol. 36 No. 3, pp. 512-524.

Xu, J., Xie, B. and Chung, B. (2019), "Bridging the gap between affective well-being and organizational citizenship behavior: the role of work engagement and collectivist orientation", *International Journal of Environmental Research and Public Health*, Vol. 16 No. 22, p. 4503.

Xue, X., Shen, Q. and Ren, Z. (2010), "Critical review of collaborative working in construction projects: business environment and human behaviors", *Journal of Management in Engineering*, Vol. 26 No. 4, pp. 196-208.

Yang, D., He, Q., Cui, Q. and Hsu, S.C. (2018), "Organizational citizenship behavior in construction megaprojects", *Journal of Management in Engineering*, Vol. 34 No. 4, 04018017.

Yang, D., He, Q., Cui, Q. and Hsu, S.C. (2020), "Non-economic motivations for organizational citizenship behavior in construction megaprojects", *International Journal of Project Management*, Vol. 38 No. 1, pp. 64-74.

Yu, M., Vaagaasar, A.L., Müller, R., Wang, L. and Zhu, F. (2018), "Empowerment: the key to horizontal leadership in projects", *International Journal of Project Management*, Vol. 36 No. 7, pp. 992-1006.

Zhang, X. and Bartol, K.M. (2010), "Linking empowering leadership and employee creativity: the influence of psychological empowerment, intrinsic motivation, and creative process engagement", *Academy of Management Journal*, Vol. 53 No. 1, pp. 107-128.

Zhang, S., Fu, Y. and Kang, F. (2018), "How to foster contractors' cooperative behavior in the Chinese construction industry: direct and interaction effects of power and contract", *International Journal of Project Management*, Vol. 36 No. 7, pp. 940-953.

Zheng, X., Zhu, W., Zhao, H. and Zhang, C. (2015), "Employee well-being in organizations: theoretical model, scale development, and cross-cultural validation", *Journal of Organizational Behavior*, Vol. 36 No. 5, pp. 621-644.

Zheng, J., Gou, X., Wu, G., Zhao, X., Li, H. and Liu, B. (2021), "The ambidextrous and differential effects of directive versus empowering leadership: a study from project context", *Leadership and Organization Development Journal*, Vol. 42 No. 3, pp. 348-369.

Zheng, J., Gu, Y., Zhang, Z., Xie, H., Li, P. and Li, H. (2022), "The relationship between empowering leadership and project performance: a resource perspective", *Engineering, Construction and Architectural Management*, ahead-of-print No. ahead-of-print. doi: 10.1108/ECAM-11-2021-1024.

Zhou, Y., Du, J., Shi, Q. and Horlen, J. (2016), "Directive vs. empowering leadership in temporary project teams: an agent-based modeling approach", *Proceedings of the 2016 Construction Research Congress*, San Juan, Puerto Rico, pp. 1876-1885.

About the authors
Ziyao Zhang is a Graduate Student at the Institute of Project Management, School of Mechanics and Civil Engineering, China University of Mining and Technology. His main research area is leadership, knowledge management, blockchain and prefabrication. His work has been published in *Engineering, Construction and Architectural Management, International Journal of Occupational Safety and Ergonomics, International Journal of Environmental Research and Public Health, Sustainability, Advances in Civil Engineering, Frontiers of Engineering Management, Journal of Safety and Environment*.

Guodong Ni (PhD) is an Associate Professor at the Institute of Project Management, School of Mechanics and Civil Engineering, China University of Mining and Technology. His research interests focus on knowledge management, project management, project members' well-being at work and behavior safety management. Dr Ni's research has been published in *Journal of Management in Engineering, Engineering, Construction and Architectural Management, International Journal of Environmental Research and Public Health, Sustainability, Building Research and Information, Advances in Civil Engineering, Frontiers of Engineering Management, Journal of Engineering Science and Technology Review, Proceedings of ICCREM 2020*, etc. Guodong Ni is the corresponding author and can be contacted at: niguodong_cumt@126.com

Han Lin (PhD) is an Associate Professor at School of Information Engineering, the director of Jiangsu Key Laboratory of Public Project Audit, Nanjing Audit University. He received his PhD degree from Shanghai Jiao Tong University. His current research interests include corporate social responsibility, project management, technology innovation, environmental management etc. His research has been published in international academic journals, such as *Technovation, International Journal of Project Management, Journal of Management in Engineering* etc.

IJMPB

Zongbo Li (PhD) is an Assistant Professor in the Department of Organizational Behavior and Science, School of Economics and Management, China University of Mining and Technology. His research interests focus on employee psychology and behavior, leadership theory, human resource management, environmental management etc. Dr Li's research has been published in *Frontiers in Psychology, Journal of Industrial Engineering/Engineering Management, Foreign Economics and Management, Journal of Psychological Science, Studies of Psychology and Behavior* etc.

Zhipeng Zhou (PhD) is an Associate Professor in Department of Management Science and Engineering, College of Economics and Management, Nanjing University of Aeronautics and Astronautics. His current research interests include safety management, project management, industrial engineering, information system and information management etc. His research has been published in *Safety Science, Accident Analysis and Prevention, International Journal of Project Management, Journal of Management in Engineering, Journal of Construction Engineering and Management, Journal of Computing in Civil Engineering, Automation in Construction, Tunnelling and Underground Space Technology, Construction Management and Economics* etc.