



## The antecedents of employees' innovative behavior in hospitality and tourism contexts: A meta-regression approach

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### ABSTRACT

While many empirical studies have examined the various factors that influence employee innovative behavior (EIB), there have been few efforts to synthesize previous research to understand how EIB is linked to its antecedents. Based on 125 empirical studies ( $N = 44,427$ ) in the context of hospitality and tourism, this study used meta-regression to investigate the 30 major antecedents of EIB, as well as the moderating roles played by 'national culture' (individualism vs. collectivism), 'age' and 'gender', on the links between the antecedents and EIB. The results showed that 'perceived meaningfulness at work' and 'work engagement' were found to have stronger relations with EIB than others, and that 'national culture', 'age', and 'gender', moderated the relations between EIB and several of the antecedents. The theoretical and practical implications of the findings are discussed for researchers and practitioners alike.

### 1. Introduction

Given the complex and dynamic changing work environment, innovation has been widely claimed to be a crucial element for an organization's success and long-term survival (Liu et al., 2016). According to a report published by PWC (2013), leading innovative companies receive revenue growth of 25% from their innovative products and services. Crespi and Zuniga (2012) identified that an employee's productivity could increase by 100% if companies introduced innovative technology, and Wang and Netemeyer (2004) indicated that innovation is an essential characteristic of a successful employee as it allows for better problem-solving and produces a competitive advantage. By thinking differently, creative employees can provide a broader outlook that enables organizations to respond to trends and challenging situations.

In the hospitality and tourism industry, innovation is usually service-oriented. The service delivery process requires human interactions to provide both tangible and intangible services, which is different from the generic business context that focuses more on manufacturing products (Bavik and Kuo, 2022). Moreover, the hospitality and tourism industry can at times be unpredictable and challenging, and creative thinking is required to find new prospects and solutions for firms

delivering unique experiences for customers (Chang and Teng, 2017; Horng et al., 2016). Employee innovative behavior (EIB) has therefore received attention from researchers and practitioners. For example, in the face of the Covid-19 pandemic, changes in adaptive competence were inevitable for the hospitality and tourism industry in order to satisfy customers' sophisticated needs (e.g., offering contactless delivery and service) (Bavik and Kuo, 2022; Breier et al., 2021). It is therefore unsurprising that researchers have advanced their interests to investigate the factors that enhance EIB in the hospitality and tourism contexts (He et al., 2021; Horng et al., 2016).

Although numerous hospitality and tourism studies have explored various antecedents driving EIB, the understanding of these antecedents remains incomplete in three aspects: First, existing individual studies have tended to focus on a couple of selected constructs for enhancing EIB based on different theoretical perspectives (Chang and Teng, 2017; Jung and Yoon, 2018). In other words, the fragmented results of previous empirical research failed to provide a holistic picture of EIB.

Second, the relations between EIB and its antecedents vary in previous individual works, leading to conflicting findings and misleading information for both researchers and practitioners. For example, both positive ( $r = 0.34$ ; Javed et al., 2017) and negative ( $r = -0.175$ ; Rice,

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2006) correlations between empowerment and EIB were identified, and a further two studies showed strong ( $r = 0.503$ ; (Wihuda et al., 2017) and weak ( $r = 0.146$ ; Karatepe and Olugbade, 2016) correlations between work engagement and EIB, respectively. Hence, to advance the current state of knowledge on EIB, it is necessary to conduct a comprehensive review that employs meta-analytical techniques to evaluate the true effect sizes between EIB and its antecedents.

According to Hunter and Schmidt (2004), meta-analysis is a rigorous method that can overcome the limitations of single studies (e.g., sampling error) by quantitatively synthesizing results from multiple studies to more precisely provide the statistics of the effect size of an association. A limited number of review studies have focused on EIB in the hospitality and tourism contexts (Bavik and Kuo, 2022; Hon and Lui, 2016; Ouyang et al., 2021). However, the robustness and comprehensiveness of their findings are constrained by the relatively small sample size. For example, a previous meta-analytical work of Ouyang et al. (2021) only examined a range of antecedents based on a specific theory. To date, a review study with large sample size that meta-analytically evaluate the relations between EIB and its antecedents is still missing.

Third, much of variation in effect sizes observed across individual studies still remains unexplained. For example, Huang and Liu (2019) have called for more studies to examine how personal motivations and culture can strengthen and weaken the relation between EIB and its antecedents to extend current knowledge. Therefore, investigating boundary conditions can provide valuable insights into improving the accuracy of EIB forecasts in the hospitality and tourism settings. As Hunter and Schmidt (2004) stated, meta-analysis is a useful technique to explore unexamined moderators that can draw the attention of future researchers. For these reasons, additional effort and the use of meta-analysis (e.g., meta-regression) is required to discover latent moderators that have not been previously tested (Ouyang et al., 2021).

To address the aforementioned gaps in the literature, the present study conducted a meta-analytical review of the antecedents of EIB in the hospitality and tourism context. In particular, the magnitude, direction, and heterogeneity of effect sizes between the EIB and its antecedents was assessed. To extend the results, the latent moderators on the relationships (i.e., culture, age, and gender) were also investigated using a z-test and meta-regression. The meta-analytical results of this study provide a significant contribution to the understanding of the current hospitality and tourism literature on EIB. It not only provides solid support for the theoretical relations between constructs but also explains in what condition these relations are intensified or mitigated. Therefore, the research areas that need further investigation are highlighted. From a managerial perspective, the information presented in this study is of value as it can offer a clear and robust direction to guide practitioners in the development of EIB.

## 2. Literature review

### 2.1. Conceptualizations of employee innovative behavior

Within the field of innovative behavior, the terms ‘innovative behavior’ and ‘creative behavior’ are often used interchangeably because the distinction between the two terms is blurred (Scott and Bruce, 1994; Shin et al., 2017). In general, ‘creative behavior’ is the creation of a novel idea (Li and Hsu, 2016), while ‘innovative behavior’ refers not only to the generation of an idea, but also the testing, and implementation of a new idea or concept into widespread use (Kim and Lee, 2013). In essence, although the concepts of creativity and innovation are interrelated and have some resemblances (Bavik and Kuo, 2022; Hon and Lui, 2016), innovative behavior that produces final outputs and real benefits is broader than the concept of creative behavior alone (Shin et al., 2017).

According to Janssen (2000), innovative behavior is viewed as a multistage process that involves the generation, promotion, and application of ideas. To begin with, individuals generate novel and useful

ideas and solutions based on problem recognitions. The next task in the process focuses on promoting and building support for new ideas by engaging in social activities with team members, friends, or supporters. This ensures that the idea is feasible for the purpose of personal and organizational performance (Scott and Bruce, 1994). The last stage produces a model of innovation that can be applied within a work role or an organization. Specifically, innovations can be accomplished and carried out by individual workers, or by teamwork that requires interpersonal skills and collaborations (Janssen, 2004). Therefore, each stage of the process includes different behaviors or views that when put together, produce and implement novel ideas and solutions.

In the hospitality and tourism fields, innovation is service-based, which requires interaction with customers rather than manufacturing services. Indeed, Bavik and Kuo (2022, p. 327) state that EIB in hospitality and tourism can be described as “the skills and talents that offer unique services finding practical and social regulatory solutions”. Employees thus play a pivotal role in offering creative thinking, service, or products to accurately respond to customer demands and organizational goals (Luu, 2019). From the discussion above, the present study considers EIB to be ‘the generation and implementation of new ideas, products, and services to a person’s work role or an organization in the hospitality and tourism context’.

### 2.2. Theories and antecedents of employee innovative behavior

In order to understand EIB, it is important to identify the antecedents linked to EIB. Through reviewing tourism and hospitality literature and existing theories, it was discovered that the antecedents can be classified into the following five categories; ‘individual characteristics’, ‘leader’s leadership styles’, ‘team characteristics’, ‘organizational characteristics’, and ‘work attitudes’.

#### 2.2.1. Individual characteristics

In the hospitality and tourism industry, individual characteristics have received much attention in EIB research (Eid and Agag, 2020; Wang et al., 2014). The antecedents in this category refer to dispositional traits that vary between individuals, and include demographic and human capital factors (e.g., gender, education, career tenure, and creative self-efficacy). Trait theory shows that people react and behave differently due to personal traits (Allport, 1937). For example, Horng et al. (2015) discovered that employees with innovative personality traits tend to come up with new approaches to solving problems. Human capital theory states that human behaviors can differ by career tenure because people with long career tenure tend to have more experience, skills and knowledge. This, in turn, increases their levels of productivity and competency to produce innovative ideas in the workplace (Becker, 2009).

#### 2.2.2. Leader’s leadership styles

Researchers have assumed that EIB is influenced by the ‘leadership style’ of a leader (e.g., empowering leadership, ethical leadership, leader-member exchange) which describes how leaders or managers act towards others in different situations. The relationship between the leadership style of a leader and EIB can be explained by existing theories. For example, leader-member-exchange theory implies that in an organization, managers who develop a positive relationship with their team members through social exchanges can subsequently affect employee’s performance and behavior (Graen and Uhl-Bien, 1995). Transformational leadership theory proposes that leaders who are enthusiastic, caretaking, and inspired, can act as role models which create positive changes invested in their followers to achieve better outcomes (Downton, 1973). It is thus reasonable to assume that antecedents related to leader’s leadership styles play a pivotal role in promoting EIB (Riva et al., 2021; Ruiz-Palomino and Zoghbi-Manrique-de-Lara, 2020).

### 2.2.3. Team characteristics

EIB is not only influenced by personal motivations, but also by interpersonal relationships between individuals. In this category, the antecedents associated with ‘team characteristics’ (i.e., knowledge-sharing and team environment) are the employees’ shared feelings and perceptions relating to the people in a group. The relation between team characteristics and EIB can be supported by several theories. Network theory posits that “mechanisms and processes interact with network structures to yield certain outcomes for individuals and groups” (Borgatti and Halgin, 2011, p. 1168). Social learning theory suggests that human behavior is determined by learning and observing others (Bandura and Walters, 1977). Thus, it is sensible to explore how the team ‘climate’ can affect EIB. Researchers also claim that when employees are surrounded by a supportive team culture, they are more likely to collaborate and generate innovative behaviors (Hur et al., 2016; Yang et al., 2021); this is particularly relevant for hospitality and tourism. For example, Kim and Lee (2013) noted that hotel employees’ knowledge exchange in the workplace encourages them to provide innovative service.

### 2.2.4. Organizational characteristics

The ‘organizational characteristics’ group of antecedents represents the organizational climate as perceived by employees. Under a cooperative and innovative environment (i.e., innovative climate, cooperative culture), employees can be encouraged and stimulated to foster innovative behavior (Karatepe et al., 2020). Social exchange theory also shows support for the relation between organizational characteristics and innovative behavior. This theory postulates that individuals assess the potential benefit and risk exchange before making their decisions (Cook and Emerson, 1987). Based on this theory, previous studies have identified that when an organization creates a positive work environment with favorable conditions, employees are more likely to reciprocate with innovative behaviors to help the organization create more competitive advantages (Volery and Tarabashkina, 2021). A recent investigation conducted by Pascual-Fernández et al. (2021) discovered that when an innovative culture served as a fundamental part of a hotel’s environment, employees also performed more innovatively.

### 2.2.5. Work attitudes

The category ‘work attitudes’ describes how the state of mind of an employee toward their work influences EIB. According to Gilson and Shalley (2004), employees with a positive attitude tend to believe that their work is meaningful and put more effort into problem-solving. The theory of planned behavior (TPB) maintains that whether an individual has a favorable or unfavorable evaluation of a desired behavior affects their subsequent decision to engage in that behavior (Ajzen, 1991). This supports the notion that antecedents related to work attitudes (e.g., work engagement, organizational commitment, and psychological empowerment) play a significant role in producing a higher level of innovative behavior. For example, Gu et al. (2017) claim that work motivation contributes to wellbeing, leading to EIB.

In summary, exploring the relationship between EIB and its antecedents in hospitality and tourism contexts has become increasingly popular. Although a number of factors related to EIB have been identified in the literature, a comprehensive review that meta-analytically assesses the relations between EIB and its antecedents remains under-investigated. Therefore, this research chose to examine the research question:

**Research Question 1..** What are the magnitude, direction, and heterogeneity of the relations between EIB and its antecedents?

## 2.3. Moderating effects: culture, age and gender

Given that the variance in effect sizes has been identified across studies, the moderating effects of culture, age, and gender were

examined in this study to provide a more comprehensive picture of the relation between antecedents and EIB.

### 2.3.1. Individualist versus collectivist national culture

Culture is defined as “the collective programming of the mind distinguishing the members of one group or category of people from others” (Hofstede, 2001). In the hospitality and tourism setting, the ability of specific drivers to affect EIB could vary across individualistic and collectivistic national cultures (Martín-Rios and Ciobanu, 2019). It has been discovered that cultural difference plays a vital role in the formation of an employee’s perceptions and behaviors; this is due to the fact that cultural groups differ in the way they judge tasks and solve problems (Huang et al., 2019). According to the cultural dimension theory developed by Hofstede, individualism and collectivism reflects an individual’s beliefs and the formation of behavioral patterns in Western and Eastern cultural backgrounds. In an individualistic culture, people value their own uniqueness and tend to focus more on an independent self-view to pursue personal goals and benefits. Collectivists, on the other hand, tend to prefer social harmony, and are regulated to avoid problems and conflicts by the norms and obligations of other people.

Moreover, Eid and Agag (2020) suggest that national culture can determine an individual’s values, even though they may have different personal expectations and behavioral reactions. This further supports the notion that the relation between EIB and its antecedents could either be strengthened or weakened due to a person’s cultural background. Unfortunately, knowledge in this area is still limited, especially in the contexts of hospitality and tourism (Bavik and Kuo, 2022; Eid and Agag, 2020), and therefore, the following research question was investigated:

**Research Question 2..** Do the relations between EIB and its antecedents differ according to national culture (i.e., collectivist versus individualist)?

### 2.3.2. Age and gender

Age and gender may influence the relation between EIB and its antecedents because employees’ personalities and values vary by their demographic characteristics (Fatemi et al., 2021). According to personality-job fit theory, the personality and value of a person has an effect on their adaptability and job performance in an organization (Kristof, 1996). This suggests that the matching of employees’ values with their needs and desires is the key to encouraging them to perform innovatively (Engelen et al., 2018).

Employees of different ages deliver different work values that may affect the relation of innovative behavior with its determinants. Researchers suggest that older employees tend to work based on their previous experience (Binnewies et al., 2008). Therefore, the older the employees, the less likely they will be to adapt to change at work, leaving them less able to act innovatively in the workplace. In contrast, younger employees appear to be more motivated to conduct innovative behavior because they value knowledge acquisition and are willing to accept new ways of working (Rauvola et al., 2020). However, studies also claim that older workers show higher levels of innovativeness due to their work engagement and decision latitudes. For example, Ng and Feldman (2013) considered that compared with younger employees, their older counterparts (who tended to be in middle or later stages of their career) were more familiar with an organization. With their increased age, they were more likely to have greater expertise and judgment, which allowed them to engage in innovative activities, and assisted them to solve problems from a variety of angles. Studies, therefore, while indicating that contrasting views coexist, agree that the relation between EIB and its antecedents could vary by age due to the fact that differing ages evaluate and perceive things differently (Binnewies et al., 2008).

Gender could also influence the link between EIB and its antecedents; different genders may demonstrate different construal of ‘self’ due to expected sex roles, and existing literature has investigated EIB and its

antecedents according to gender differences. Social role theory posits that society tends to have gender stereotypes that affect a person’s perception, judgment, and behavior (Eagly and Wood, 2012). Smith et al. (2013) indicate that gendered expectations are held not only by supervisors and co-workers, but also by employees themselves, which shapes the ways that people perceive themselves and behave in the workplace. The stereotypical ‘male’ is usually believed to be independent, decisive, adventurous, and committed to the job, while a ‘female’ is assumed to be more collaborative and considerate (Hora et al., 2021). To this end, people, no matter which gender, may face different barriers and expectations that reflect the influence of their perceptions on EIBs. Yuan and Ma (2022), for example, have identified the ways that gender moderates the relationship between EIB and organizational commitment and interpersonal trust. Age and gender have received attention in innovative behavior literature (Ng and Feldman, 2013), but limited studies have taken age and gender differences into consideration to understand the relation between EIB and its antecedents. This absence of knowledge has generated the third research question.

**Research Question 3.** Do the relations between EIB and its antecedents vary by (a) employee age, and (b) employee gender?

### 3. Methodology

#### 3.1. Search strategy

Computer-based searches using the following keywords, (‘innovative work behaviour’ OR ‘innovative behaviour’ OR ‘creativity’ OR ‘creative behaviour’ OR ‘creative performance’) AND (‘hospitality’ OR ‘tourism’

OR ‘hotel’ OR ‘restaurant’ OR ‘travel’), were undertaken. Electronic databases included, EBSCOhost, ScienceDirect, and Google Scholar. The advanced search options of these search engines were employed to identify and filter innovative behaviour-related studies within hospitality and tourism publications. To expand the search, an unstructured search was also conducted to locate further relevant articles—those conducted in a hospitality and tourism context but published in non-hospitality and tourism journals (e.g., *Journal of Business research*, *The Service Industries Journal*, *Journal of Creative Behaviour*, *Management Decision* and *Journal of Management and Organization*).

#### 3.2. Criteria for inclusion and paper selection

The following inclusion criteria were used. First, the study had to be an empirical work—review studies and qualitative works were excluded. Second, the study had to be written in English. Third, the main research focus of the study had to be on hospitality and tourism employees’ innovative behaviour. Fourth, the study had to report sample size and at least one correlation between the antecedents and innovative behaviour (e.g., Pearson product-moment correlation or other types of statistics that could be used to calculate correlation coefficients *r*, such as *t*-statistics and standardized beta coefficients). Studies with insufficient data for meta-analysis were excluded.

Paper selection was carried out by taking the inclusion criteria into consideration and following Moher’s (2009) PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) procedures (see Fig. 1). The computer-based searches generated a total of 11,309 studies. After removing duplicates, the titles and abstracts of the

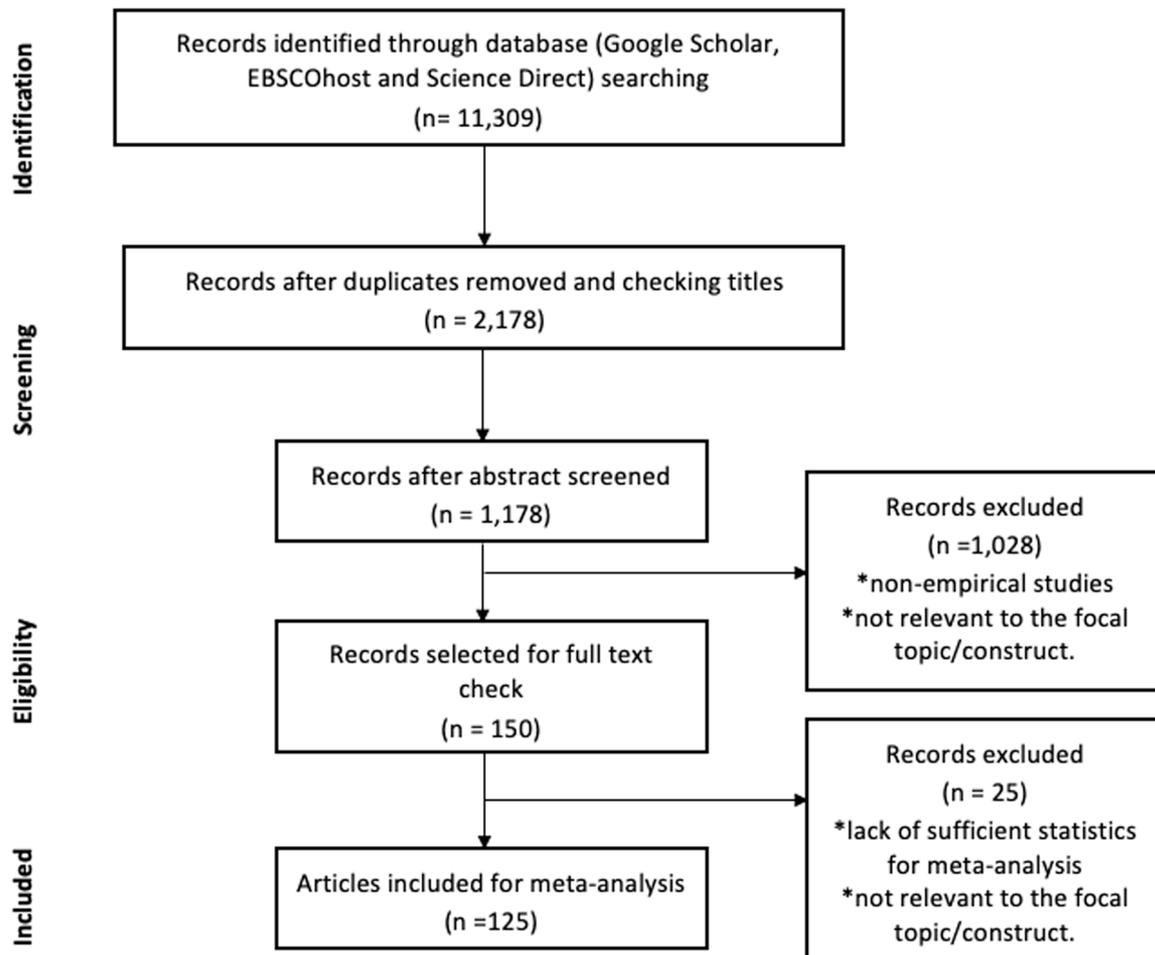


Fig. 1. Paper selection procedures.

remaining works were checked. The screening phase generated  $n = 150$  studies for additional checking. The eligibility of these works for inclusion was evaluated by reading the full-text articles. Twenty-five studies were excluded at this final stage, yielding a final sample of 125 for the meta-analytical review (126 individual samples).

### 3.3. Coding

The coding of the included studies was performed by the two members of the research team; a coding scheme was created to maintain the consistency of coding. Microsoft Excel 2019 was used to record the coded information. Only codes that achieved 100% agreement were recorded—any discrepancies between the coding of the two coders were addressed by double-checking the original article and discussion with the other team members. The coding procedures were as follows: 1) The characteristics of the included studies were retrieved, including author name, publication year, source, region where the study was conducted, and research design. 2) The relation between the antecedents and EIB was then documented. The scale used to measure innovative behaviour was also coded by study. 3) After this, the statistical information needed for the meta-analysis and meta-regression analysis was coded, including effect size, reliability scores, sample size, mean age and gender distribution (i.e., percentages of males).

Particular attention was paid to the following coding issues. First, regarding effect size, as this research sought to investigate the relationships between the antecedents and EIB, Pearson's correlation ( $r$ ) was used as the effect size index when synthesizing estimates from empirical works (see Hunter and Schmidt, 2004). Among the included samples, most reported correlation coefficients. Five studies reported standardized betas only, and in this situation, the findings were converted into correlation coefficients using the method recommended by Peterson and Brown (2005) (see Butts et al., 2013; Tanford and Jung, 2017). Second, as per the coding practice of existing meta-studies (e.g., Lapierre et al., 2016), when reliability scores of a variable were not reported, the mean reliability of such variable across all the included studies was computed and utilized as the substitute. A range of individual attributes (e.g., age, gender and tenure) were considered to be absolutely reliable, and the alpha coefficient of 1 was set for these antecedents. In order to examine the moderating role of culture, this was coded in two different ways. In the first instance, culture was treated as a categorical variable and coded as 'collectivistic' (for eastern countries, such as China, Korea and Vietnam), 'individualistic' (for western countries, such as the USA, Norway and Switzerland), or 'unknown' (in the case of research that did not specify where it was conducted). This is consistent with recent meta-analytic works (e.g., Park and Min, 2020; Lin et al., 2022). In the second instance, culture was coded as a numeric variable, using the individualism scores from Hofstede's five dimensions of culture. According to Hofstede (2001), the higher the score on this dimension, the higher the degree of individualism.

### 3.4. Data analysis

The procedures of Hunter and Schmidt's (2004) psychometric random-effect meta-analysis were adopted to aggregate effect sizes, that is, to estimate zero-order correlations corrected for sampling error and measurement. In the first instance, the sample size adjusted mean ( $r_+$ ) was computed as:

$$r_+ = \frac{\sum N_i r_i}{\sum N_i}$$

where  $N$  is the sample size of the empirical study, and  $r_i$  represents the observed effect size in particular study  $i$ . The adjusted mean of the sample size was then corrected for attenuation due to measurement error, by use of the formula:

$$\rho = \frac{r_+}{\sqrt{r_{xx}}\sqrt{r_{yy}}}$$

where  $r_{xx}$  indicates the reliability scores of variables  $x$  (i.e., the antecedent) and  $r_{yy}$  the reliability scores of variables  $y$  (i.e., EIB), and  $r_+$  is sample size adjusted mean. To evaluate whether the average corrected effect size ( $\rho$ ) was statistically significant (differed from zero), 95% confidence intervals were also computed based on the formula suggested by Hunter and Schmidt (2004, p. 206).

The standard deviation and 80% credibility interval (see Hunter and Schmidt, 2004, p.205) of each correlation was calculated to demonstrate an estimate of the variance around the corrected effect size. In addition, and in keeping with Gao et al. (2016), a Q test to examine homogeneity in effects across studies, was also employed, to further explore the existence of moderators. The following formula was used:

$$Q = \sum w_i (z_i - \bar{z})^2$$

where  $w_i$  is a study weight (inverse variance weight), and  $z_i$  is the study's observed Fisher's Z-transformed effect size (see Hedges and Olkin, 1985) and  $\bar{z}$  the weighted average of Z-transformed correlations. A significant Q-statistic indicates significant variations in the effect size due to sample heterogeneity, instead of sampling error.

After performing psychometric meta-analysis, sensitivity tests (including vs. excluding studies with extremely large effect size) and publication bias analyses (e.g., Egger's and Begg's tests) were carried out to assess the robustness of the meta-analytical findings. Besides, we also conducted a series of moderation analyses to try to explain heterogeneity. Consistent with Lim and Ok (2021), a two-level verification of the moderating role of national culture was conducted. First, as suggested by Hunter and Schmidt (2004), a Z-test was undertaken to examine whether the corrected mean effect sizes for the subgroups (collectivistic vs. individualistic) were significantly different from each other. Next, following Lipsey and Wilson's (2001) procedures, meta-regression analysis utilizing weighted least square regression was then performed for the relations whose achieved Z-scores were statistically significant. Specifically, effect sizes were regressed on national culture (Hofstede's individualism scores), allowing for an examination of the relation between a study-level covariate (independent variable) and effect sizes (dependent variable). Such meta-regression procedures were also applied when exploring the potential moderating role of other numerical study-level covariates (i.e., age and gender distribution). It should be noted that in order to avoid second-order sampling bias (see Hunter and Schmidt, 2004), meta-analysis and meta-regression analysis were not performed on relations with less than three primary works.

## 4. Findings

### 4.1. Descriptive information

A total of 125 individual studies (126 samples) published between 2006 and 2021 were included for meta-analysis. The graph, Publication by year (see Fig. 2) demonstrates an increasing trend in EIB publications, with a significant number of studies published in 2021. The sample size of the included works ranged from 54 to 2360 (Mean 353, SD = 249). Of the 125 studies published in 49 different journals, 20% were published in the *International Journal of Hospitality Management*. This was followed by the *International Journal of Contemporary Hospitality Management* (13%) and *Tourism Management* (8%).

Table 1 shows additional characteristics of the included studies. It can be seen that 80% were published in hospitality and tourism journals and that the balance was published in non-hospitality and tourism journal publications. In terms of research contexts, 81% of the studies were examined in the hospitality industry with the lodging sector (68%) being the most examined sector by researchers. The included studies were conducted in 34 different regions, with China (19%), being a

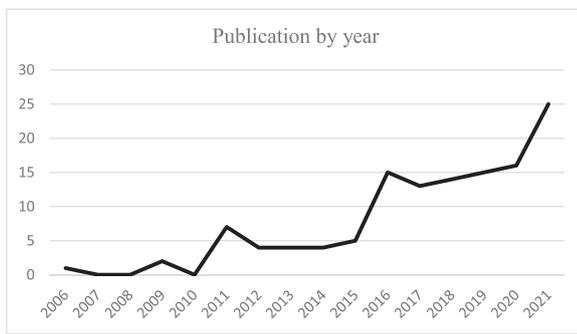


Fig. 2. Sample description-publication by year.

Table 1  
Sample description.

Aspects	No. of studies	Percentages of studies (%)
<i>Journal</i>		
Hospitality and Tourism	99	80
Non-Hospitality and Tourism	26	20
<i>Sectors</i>		
Hospitality	101	81
• Lodging	86	68
• Food & Beverage	8	6
• Unspecified	9	7
Tourism	11	9
Hospitality and Tourism	13	10
<i>Region (34 different countries/regions)</i>		
China	24	19
Taiwan	18	14
Turkey	10	8
Korea	9	7
India	7	6
Other	57	46
<i>Frequently used measurement scale</i>		
Zhou and George (2001)	24	20
Janssen (2000)	14	11
Hu et al. (2009)	13	10
<i>Frequently used theories</i>		
Social exchange theory	11	9
The conservation of resources theory	8	6
Theory of leader member exchange	6	5
<i>Research design</i>		
Cross-sectional studies	107	85
• Quantitative	103	82
• Mixed-methods	4	3
Longitudinal studies	17	14
• Multi-wave	3	3
• Time-lagged	14	11
Experimental	1	1

dominant sample collection region, followed by Taiwan (14%) and Turkey (8%). Regarding the frequently used measurement scales for EIB, Zhou and George (2001) (20%), Janssen (2000) (11%) and Hu et al. (2009) (10%) were the top three scales. As for the theories, social exchange theory was used in 11 studies (9%) followed by the conservation of resources theory, and the theory of leader-member exchange. With respect to research design, cross-sectional research design was most frequently used (85%); very few of the included works employed mixed-method (3%) or experimental design (1%).

## 4.2. Meta-analysis

### 4.2.1. The relations between the antecedents and EIB

To answer Research Question 1, the antecedents of EIB were classified into five categories that drew upon psychological theories, including, individual characteristics, leader’s leadership styles, team characteristics, organizational characteristics, and work attitudes (see Fig. 3). Table 2 presents the psychometric meta-analytical results based

on the 125 empirical studies ( $N = 44,427$ ). All the antecedents examined, except for that of job security (95% CI =  $[-0.03, 0.14]$ ), were found to have a statistically significant impact on EIB. Significant Q-statistics (heterogeneity) were captured for most relations, indicating the existence of potential moderators.

Among the individual characteristic antecedents, and apart from age, gender, education and tenure, creative self-efficacy ( $k = 23$ ) was also a frequently investigated individual characteristic. Regarding the magnitude of the relations, proactive personality ( $\rho = 0.45$ ) and creative self-efficacy ( $\rho = 0.50$ ) had moderately strong associations with EIB.

Among the leadership related antecedents, transformational leadership ( $k = 17$ ) and leader-member exchange ( $k = 10$ ) were relatively more studied while only a small number of studies ( $k = 4$ ) examined the relation between ethical leadership and EIB. It was found that leader-member exchange ( $\rho = 0.49$ ), empowering leadership ( $\rho = 0.41$ ), and transformational leadership ( $\rho = 0.41$ ), had a moderately strong influence on EIB.

The results also demonstrated that there were significantly moderate associations of EIB with team characteristics. In particular, knowledge sharing ( $k = 13$ ,  $\rho = 0.48$ ), peer support ( $k = 8$ ,  $\rho = 0.39$ ) and team environment ( $k = 8$ ,  $\rho = 0.42$ ), were relatively more examined and found to have a comparatively stronger effect on EIB.

All of the antecedents associated with organisational characteristics had a statistically significant effect on EIB. Co-operative culture ( $k = 19$ ) was the most studied variable, followed by employee involvement ( $k = 14$ ) and organizational support ( $k = 13$ ). With regard to magnitude, innovative climate ( $\rho = 0.50$ ), rewards ( $\rho = 0.42$ ) and co-operative culture ( $\rho = 0.42$ ) had relatively stronger influences on EIB.

The meta-analytical findings also disclosed that except for job security ( $\rho = 0.06$ ), all the attitudinal antecedents were significantly related to EIB, and that work motivation ( $k = 17$ ) and psychological empowerment ( $k = 16$ ) were the two relatively more investigated variables. Overall, the antecedents in this category showed greater impact on EIB than those in other groups. For example, perceived meaningfulness at work ( $\rho = 0.56$ ), work engagement ( $\rho = 0.51$ ), work motivation ( $\rho = 0.50$ ) and organisational commitment ( $\rho = 0.50$ ), were found to have strong influences on EIB. However, there was only a weak negative relation between burnout ( $\rho = -0.16$ ) and EIB.

### 4.2.2. Sensitivity test and publication bias analysis

When reviewing the data, it was detected that four effect sizes (for the correlations of EIB with age, gender, education and organizational support) were recorded from an empirical work (Eid and Agag, 2020) using a very large sample ( $k = 2360$ ). Within the samples, there was a single paper with a sample size that was in excess of 2000, implying that the results from this paper could potentially have undue influence on meta-analytically evaluated estimates (e.g., sample size-weighted mean of the correlations) (see Hunter and Schmidt, 2004; Lim and Ok, 2021). Sensitivity analyses both with and without this study were performed using Z-test. The results demonstrated that there were no statistically significant differences ( $z = 0.02, p > 0.05$ ;  $z = 0.12, p > 0.05$ ;  $z = 0.02, p > 0.05$ ;  $z = -0.05, p > 0.05$ ) between the two situations in the four relations entailing the effect sizes reported by Eid and Agag (2020). Hence, it was decided that this study could be retained in the meta-analysis.

In line with extant meta-studies (e.g., Castro-Nuño et al., 2013; Pletzer et al., 2019), in order to assess latent publication bias, funnel plots that presented effect estimates against sample sizes and their statistical analogues (i.e., Egger’s test, Egger et al., 1997; Begg’s test, Begg and Mazumdar, 1994) were utilized. The results showed that the shapes of the funnel graphs were relatively symmetrical. The findings of Egger’s and Begg’s tests further confirmed that there was no obvious evidence of publication bias ( $p > 0.05$ ) for all the examined relations. Taken together, it was considered that publication bias was unlikely to have contaminated the results of the present meta-study.

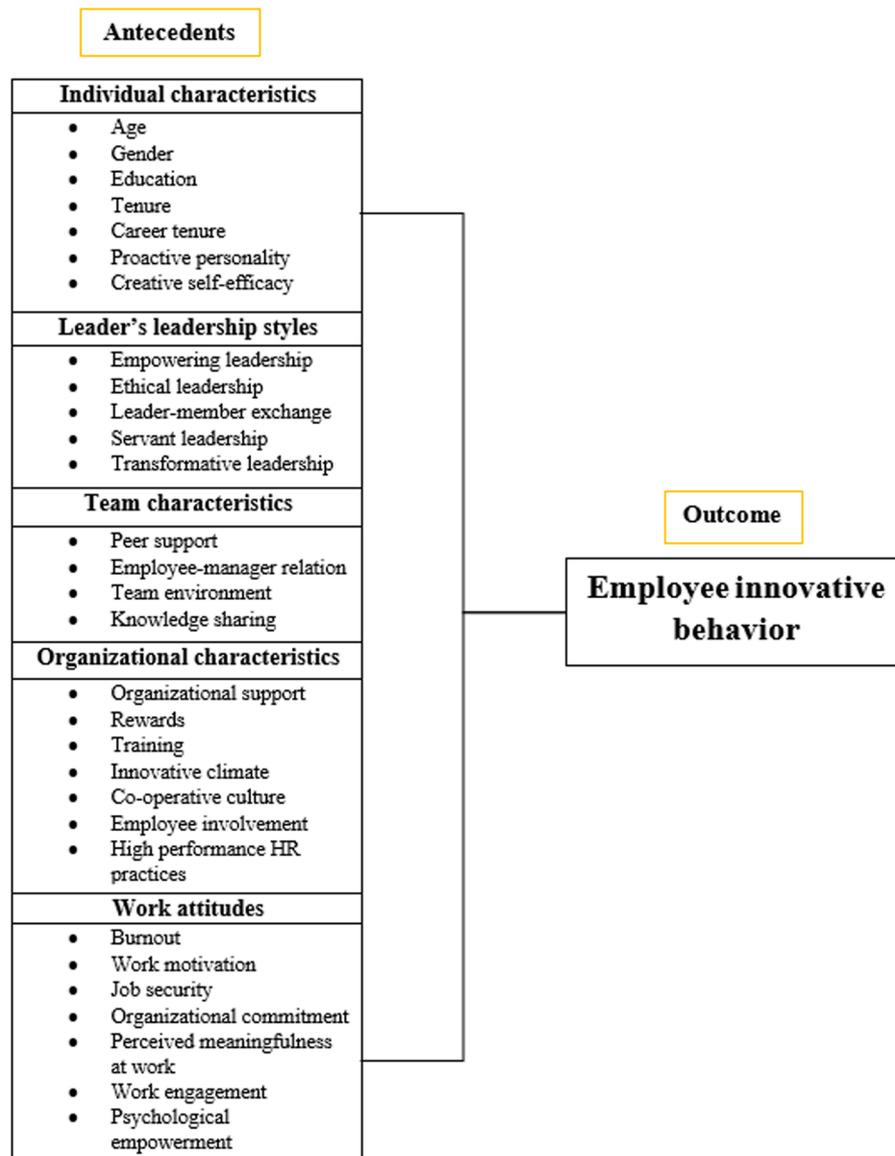


Fig. 3. Five categories of antecedents of EIB.

### 4.3. Moderation analysis

#### 4.3.1. The moderating role of national culture

Two-level verification (Z-test and Meta-regression) was conducted to examine the role of national culture on EIB (Research Question 2). First, the findings from the Z-test (see Table 3) revealed that the relationship between employee involvement and EIB was significantly stronger for individualistic culture ( $\rho = 0.50$ ) than for collectivistic culture ( $\rho = 0.34$ ). However, the influence of work motivation on EIB was significantly stronger for collectivist culture ( $\rho = 0.50$ ) than for individualistic culture ( $\rho = 0.38$ ).

Such findings were further supported by the results of the meta-regression analysis (see Table 4). The meta-regression findings illustrated that the relation between employee involvement and EIB became more positive as individualism increased ( $\beta = 0.173$ ), while the influence of work motivation on EIB became weaker as individualism increased ( $\beta = -0.383$ ).

#### 4.3.2. The moderating role of age

Table 5 presents meta-regression results for the latent moderating effect of age (Research Question 3a). The findings suggest that age

significantly moderated the relations of EIB with career tenure, leader-member exchange and peer support. Specifically, the results show that the relationship between career tenure and EIB became more positive as age increased ( $\beta = 0.742$ ). However, the extent of the relationship between leader-member exchange and EIB became weaker when age was increased ( $\beta = -0.675$ ). The results also depict that the intensity of the relationship between peer support and EIB tended to be stronger when employees' age increased ( $\beta = 0.834$ ).

#### 4.3.3. The moderating role of gender

Table 6 depicts meta-regression results for the latent moderating effect of gender (Research Question 3b). The results demonstrate that gender significantly moderated the relations of EIB with creative self-efficacy, empowering leadership, and organizational support. The relationship between creative self-efficacy and EIB tended to become less positive when the percentage of males increased ( $\beta = -0.452$ ). However, the relationship

between empowering leadership and EIB appeared to be stronger as the percentage of males increased ( $\beta = 0.722$ ). The findings also indicated that the increased percentage of males had a negative influence on the relationship between organizational support and EIB ( $\beta = -0.606$ ).

**Table 2**  
Psychometric meta-analysis.

Antecedents	<i>k</i>	<i>N</i>	<i>r</i>	$\rho$	<i>SD<math>\rho</math></i>	95%CI	80% CR	<i>Q</i>
<b>Individual characteristics</b>								
Age	39	15,338	0.08	0.08	0.23	[0.07, 0.10]	[- 0.20, 0.37]	711 ***
Gender	36	13,566	0.06	0.06	0.23	[0.05, 0.08]	[- 0.22, 0.34]	611 ***
Education	31	12,070	0.26	0.28	0.32	[0.26, 0.30]	[- 0.12, 0.68]	1211 ***
Tenure	26	8559	0.07	0.08	0.27	[0.05, 0.10]	[- 0.27, 0.42]	575 ***
Career tenure	8	2352	0.05	0.04	0.10	[0.01, 0.09]	[- 0.05, 0.15]	21 **
Proactive personality	4	1310	0.40	0.45	0.32	[0.40, 0.51]	[0.05, 0.86]	144 ***
Creative self-efficacy	23	7327	0.45	0.50	0.22	[0.49, 0.53]	[0.24, 0.77]	419 ***
<b>Leader's leadership styles</b>								
Empowering leadership	6	1142	0.36	0.41	0.16	[0.35, 0.46]	[0.23, 0.59]	30 ***
Ethical leadership	4	1309	0.25	0.30	0.02	[0.24, 0.36]	[0.30, 0.30]	1
Leader-member exchange	10	3738	0.44	0.49	0.16	[0.47, 0.53]	[0.30, 0.70]	129 ***
Servant leadership	5	1771	0.32	0.37	0.22	[0.32, 0.42]	[0.10, 0.65]	83 ***
Transformative leadership	17	6582	0.36	0.41	0.20	[0.39, 0.44]	[0.17, 0.67]	260 ***
<b>Team characteristics</b>								
Peer support	8	2322	0.35	0.39	0.14	[0.35, 0.43]	[0.22, 0.56]	52 ***
Employee-manager relation	7	2970	0.31	0.36	0.24	[0.32, 0.40]	[0.06, 0.66]	154 ***
Team environment	8	2425	0.37	0.42	0.25	[0.39, 0.47]	[0.12, 0.74]	152 ***
Knowledge sharing	13	5026	0.42	0.48	0.18	[0.46, 0.51]	[0.26, 0.71]	181 ***
<b>Organizational characteristics</b>								
Organizational support	13	5665	0.34	0.40	0.15	[0.37, 0.43]	[0.22, 0.55]	95 ***
Rewards	5	1128	0.36	0.42	0.24	[0.38, 0.50]	[0.13, 0.72]	59 ***
Training	3	586	0.31	0.35	0.27	[0.27, 0.43]	[0.01, 0.69]	44 ***
Innovative climate	11	3833	0.45	0.50	0.14	[0.49, 0.55]	[0.34, 0.70]	97 ***
Co-operative culture	19	6416	0.37	0.42	0.20	[0.40, 0.45]	[0.17, 0.68]	274 ***
Employee involvement	14	5277	0.26	0.30	0.39	[0.27, 0.33]	[- 0.20, 0.80]	706 ***
High performance HR practices	8	3220	0.31	0.38	0.22	[0.34, 0.42]	[0.10, 0.66]	140 ***
<b>Work attitudes</b>								
Burnout	9	3251	-0.16	-0.16	0.30	[- 0.20, - 0.13]	[- 0.53, 0.21]	244 ***
Work motivation	17	5735	0.42	0.50	0.21	[0.47, 0.52]	[0.23, 0.76]	279 ***
Job security	3	764	0.05	0.06	0.08	[- 0.03, 0.14]	[- 0.01, 0.12]	4
Organizational commitment	9	2665	0.44	0.50	0.15	[0.46, 0.53]	[0.22, 0.77]	70 ***
Perceived meaningfulness at work	13	3743	0.48	0.56	0.25	[0.54, 0.60]	[0.25, 0.88]	274 ***
Work engagement	12	3326	0.44	0.51	0.21	[0.47, 0.53]	[0.25, 0.77]	180 ***
Psychological empowerment	16	4889	0.39	0.46	0.24	[0.43, 0.49]	[0.17, 0.76]	265 ***

Note: \* *k* = number of studies, *N* = cumulative sample size, *r* = mean correlation,  $\rho$  = average corrected correlation, *SD $\rho$*  = standard deviation of  $\rho$ , CI = confidence interval, CR = credibility interval, *Q* = *Q*-statistic, \*\*\* *p* < 0.001

**5. Discussion**

Given the importance of EIB to the hospitality and tourism industry, insight into ways to promote EIB is still limited as previously discussed. The goal of this study was, therefore, to provide a meta-analytical review of the antecedents of EIB in the hospitality and tourism context. Based on 125 empirical studies published during 2006–2021, thirty antecedents were identified, and three moderators were examined. The results of this study have not only addressed the calls from previous EIB research, but have provided the following significant implications for researchers and practitioners.

**5.1. Theoretical implications**

Since there is a lack of a holistic picture and a comprehensive understanding of EIB literature in the hospitality and tourism context, the findings of this study provide important insights into the trends and gaps in EIB literature. As a main contribution, this study provides a more comprehensive picture of EIB than those of previous studies. First, concerning the main effects of the antecedents on EIB, the results showed that perceived meaningfulness at work ( $\rho = 0.56$ ) had the largest effect size among all other study variables, implying that it is strongly correlated to EIB. This finding alone extends the current knowledge on the antecedents of EIB, in comparison with previous qualitative reviews. Work engagement was also shown to have a strong effect on EIB ( $\rho = 0.51$ ), which is greater than the studies reported by Ouyang et al. (2021) ( $\rho = 0.49$ ), and Kanjanakan et al. (2021) ( $\rho = 0.43$  for innovative behavior and  $\rho = 0.33$  for creative performance). The reasons could be that this current study was conducted recently and was

therefore able to include more sample studies, thereby providing a more precise estimation of such relations. These findings also provide support for the conservation of resource theory (COR; Hobfoll, 1989) and the job demands and job resources (JD-R) model (Demerouti et al., 2001), revealing that work engagement is an essential antecedent of EIB among hospitality and tourism employees.

Generally, work attitudes, organizational characteristics, team characteristics, and a leader's leadership styles have been shown to have a positive effect on EIB. Work attitude variables in particular, were shown to have stronger correlations to EIB (closer to or at  $\rho \geq 0.50$ ). The results suggest that work attitude variables such as 'work motivation', 'organizational commitment', 'perceived meaningfulness at work', 'work engagement', and 'psychological empowerment' could be considered as mediators between other antecedents and EIB. Several theories can be used to justify this, for instance, the theory of planned behavior (TPB: Ajzen, 1991), which posits that a particular behavior is influenced by a certain attitude.

It is also worth noting that in this study, job security was not significantly correlated to EIB. This could be due to the low number of studies analysed. Hence, this study calls for more studies on the impact of job security and ethical leadership on EIB to expand the number of sample studies for future meta-analytical studies. In terms of individual characteristics, creative self-efficacy, only, was shown to have the strongest effect ( $\rho = 0.50$ ) among the other variables. With more sample studies (*K*=23), the effect size in this study was weaker than those reported in the study by Ouyang et al. (2021) (*K*=7,  $\rho = 0.55$ ). However, in comparison with non-hospitality and tourism context studies such as those of Liu et al. (2016), their result is weaker ( $\rho = 0.40$ ) despite having more samples (*K* = 68). The current study provides considerable

**Table 3**  
Subgroup analysis: National culture (Collectivistic vs. Individualistic) as a moderator.

Antecedents and subgroups	<i>k</i>	<i>N</i>	<i>r</i>	$\rho$	<i>SD</i> <sub><math>\rho</math></sub>	95%CI	80% CR	<i>Z</i>
<b>Individual characteristics</b>								
Age								
o Collectivistic	33	11,560	0.04	0.06	0.23	[0.04, 0.08]	[- 0.38, 0.51]	-1.07
o Individualistic	3	831	0.11	0.12	0.03	[0.05, 0.19]	[0.12, 0.12]	
Gender								
o Collectivistic	29	9690	0.04	0.04	0.17	[0.02, 0.07]	[- 0.28, 0.37]	1.01
o Individualistic	3	701	-0.01	-0.01	0.07	[- 0.09, 0.07]	[- 0.08, 0.06]	
Education								
o Collectivistic	24	8139	0.26	0.32	0.37	[0.30, 0.35]	[- 0.40, 1.00]	1.48
o Individualistic	4	984	0.06	0.08	0.08	[0.01, 0.14]	[- 0.02, 0.18]	
Creative self-efficacy								
o Collectivistic	16	5957	0.45	0.51	0.22	[0.49, 0.54]	[0.24, 0.79]	0.59
o Individualistic	5	831	0.33	0.39	0.21	[0.32, 0.46]	[0.13, 0.64]	
<b>Organizational characteristics</b>								
Innovative climate								
o Collectivistic	6	2528	0.39	0.48	0.12	[0.44, 0.52]	[0.26, 0.70]	-1.50
o Individualistic	3	699	0.58	0.61	0.21	[0.56, 0.67]	[0.21, 1.00]	
Employee involvement								
o Collectivistic	10	4013	0.30	0.34	0.36	[0.31, 0.37]	[- 0.12, 0.80]	-1.60 <sup>x</sup>
o Individualistic	3	785	0.43	0.50	0.08	[0.46, 0.59]	[0.43, 0.60]	
<b>Work attitudes</b>								
Work motivation								
o Collectivistic	13	4798	0.49	0.50	0.22	[0.49, 0.54]	[0.25, 0.79]	1.94 *
o Individualistic	4	937	0.33	0.38	0.16	[0.32, 0.45]	[0.17, 0.60]	
Psychological empowerment								
o Collectivistic	13	4296	0.39	0.46	0.24	[0.43, 0.49]	[0.15, 0.77]	-0.12
o Individualistic	3	603	0.36	0.49	0.17	[0.41, 0.59]	[0.18, 0.81]	
Perceived meaningfulness at work								
o Collectivistic	5	2100	0.52	0.61	0.23	[0.58, 0.65]	[0.32, 0.91]	-0.04
o Individualistic	4	797	0.48	0.66	0.10	[0.59, 0.73]	[0.60, 0.72]	

Note: *k* = number of studies, *N* = cumulative sample size, *r* = mean correlation,  $\rho$  = average corrected correlation, *SD* <sub>$\rho$</sub>  = standard deviation of  $\rho$ , CI = confidence interval, CR = credibility interval, *Z* = Fisher's *Z* statistics, \*  $p < 0.05$ , <sup>x</sup>  $p < 0.10$

**Table 4**  
Meta-regression for Hofstede's individualism scores.

Antecedents	<i>k</i>	<i>N</i>	<i>B</i>	<i>SE</i>	$\beta$	<i>p</i> -value
<b>Organizational characteristics</b>						
Employee involvement->EIB	13	4798	0.002	0.001	0.173	< 0.001 * **
<b>Work attitudes</b>						
Work motivation->EIB	17	5735	-0.004	0.001	-0.383	< 0.001 * **

Note: *k* = number of studies, *N* = cumulative sample size, *B* = unstandardized coefficient, *SE* = standard error,  $\beta$  = standardized coefficient, EIB = employee innovation behaviour, \* \*\*  $p < 0.001$

evidence to support the notion that increases in creative self-efficacy also increase EIB, and that this is stronger in the hospitality and tourism context. Since the industry is highly grounded on the human relation between employees and customers to create service differentiation, the findings support the human capital theory in that having employee with creative self-efficacy can produce a competitive advantage.

This study also provides a comprehensive analysis of culture and personal contexts as moderators which can explain the inconsistent effect on EIB in previous studies. Given that there have been calls for greater attention to cross-cultural issues (Huang and Liu, 2019; Jaiswal and Dhar, 2015; Watts et al., 2019), the results of the moderation analysis provide further evidence of the different effects on EIB across cultures. The findings indicated that collectivistic or individualistic nature of an employee's culture moderated the relationship between work motivation and EIB. More specifically, when employees in a collectivistic culture have high levels of work motivation, they are more likely to establish EIB than those in an individualistic culture, which differs from previous studies within non-hospitality and tourism contexts; for example, Liu et al. (2016) discovered that the relationship between work

motivation and EIB was stronger among employees in an individualistic culture. The reason for the difference could be that in a high-task interdependence environment such as the hospitality and tourism industry (Jung and Yoon, 2018), where there is a collective culture, work motivation is more important in fostering EIB, and employees also value interdependence and ingroup norms. This finding offers a note of caution for future research—when interpreting findings, national culture and study context could be considered as boundary conditions, based on a moderated moderation model.

This study also broadens the current understanding of EIB by including individual differences as moderators. To be specific, this study is the first to present a creative meta-analysis that has included age and gender as moderators to explain the inconsistent results between antecedents and EIB. The findings revealed that the relationship between peer support and EIB was significantly moderated by employee age; the older the employee, the more important peer support was in fostering EIB. First, this implies that compared to early-career workers, older employees might encounter more difficulties adapting to change at work (e.g., the adoption of new technologies) and establishing EIB, and in order to overcome such barriers, they could need assistance from their peers. To some extent, this finding also lends support to both the person-group fit (Kristof, 1996) and the goal setting theories (Locke and Latham, 2006) in that when promoting EIB as a corporate goal, the group interaction and quality of the working relationship determine how the group's collective value can be achieved.

Gender is another individual difference that was taken into account as a moderator. Similar to age, gender is usually used as a control variable. However, the interest in gender differences (as a moderator) seems to have increased, since women have been shown to have different ways of thinking than men (Wang et al., 2016). The results indicate that gender moderates the relationships between creative self-efficacy, empowering leadership, and organizational support on EIB. Specifically, the relationship between empowering leadership and EIB is stronger among male employees, while the relationships between

**Table 5**  
Meta-regression for age.

Antecedents	<i>k</i>	<i>N</i>	<i>B</i>	<i>SE</i>	$\beta$	<i>p</i> -value
<b>Individual characteristics</b>						
Gender ->EIB	22	9256	-0.019	0.016	-0.224	0.242
Education ->EIB	19	8416	0.006	0.027	0.054	0.817
Tenure ->EIB	16	5542	-0.011	0.024	-0.110	0.652
Career tenure ->EIB	5	1644	0.019	0.011	0.742	<b>0.068<sup>x</sup></b>
Creative self-efficacy ->EIB	10	3577	0.010	0.018	0.176	0.570
<b>Leader's leadership styles</b>						
Empowering leadership ->EIB	5	1021	0.011	0.009	0.451	0.230
Ethical leadership ->EIB	3	1126	0.004	0.009	0.398	0.664
Leader-member exchange ->EIB	6	2567	-0.029	0.017	-0.675	<b>0.089<sup>x</sup></b>
Servant leadership ->EIB	5	1771	0.041	0.039	0.509	0.290
Transformative leadership ->EIB	11	4705	0.001	0.015	0.004	0.991
<b>Team characteristics</b>						
Peer support ->EIB	6	1925	0.138	0.044	0.834	<b>0.002<sup>**</sup></b>
Employee-manager relation ->EIB	5	2189	0.004	0.017	0.125	0.814
Team environment ->EIB	6	2063	0.049	0.033	0.514	0.141
Knowledge sharing ->EIB	7	2423	0.007	0.023	0.142	0.740
<b>Organizational characteristics</b>						
Organizational support ->EIB	8	4470	-0.011	0.018	-0.216	0.530
Rewards ->EIB	4	975	0.008	0.022	0.250	0.701
Training ->EIB	3	586	0.022	0.046	0.432	0.632
Innovative climate ->EIB	8	2750	0.019	0.012	0.475	0.130
Co-operative culture ->EIB	13	3849	-0.004	0.016	-0.069	0.812
Employee involvement ->EIB	6	2276	0.016	0.037	0.230	0.636
<b>Work attitudes</b>						
Burnout ->EIB	8	2827	0.015	0.027	0.215	0.581
Work motivation ->EIB	9	2566	-0.003	0.019	-0.069	0.857
Organizational commitment ->EIB	5	1351	0.015	0.060	0.137	0.797
Perceived meaningfulness at work ->EIB	9	2878	-0.005	0.019	-0.098	0.794
Work engagement ->EIB	4	1149	-0.024	0.015	-0.773	0.113
Psychological empowerment ->EIB	11	2931	0.003	0.028	0.035	0.927

Note: *k* = number of studies, *N* = cumulative sample size, *B* = unstandardized coefficient, *SE* = standard error,  $\beta$  = standardized coefficient, EIB = employee innovation behaviour, <sup>\*\*</sup> *p* < 0.01, <sup>x</sup> *p* < 0.10

creative self-efficacy and organizational support on EIB are stronger among female employees. Such findings provide empirical support for the social role theory explaining employee's different choices of behaviour. For example, given that men appear to prefer to be more independent at work, being empowered to have more autonomy could enhance their EIB more than it would for women. And women, who tend to prefer to be more collaborative in the workplace, may find that having organizational support could increase their EIB more than it would for men (Hora et al., 2021).

### 5.2. Directions for future research

The current study reviewed 125 empirical studies and pinpointed 30 antecedents and three moderators of EIB. Given the significance of these findings and their theoretical implications, this study also provides fuel for future research on EIB to explore the following aspects.

First, it is worth noting that almost 80% of the primary studies were published after 2015, although the earliest study was published in 2006. This finding indicates that EIB has recently received collective attention

**Table 6**  
Meta-regression for gender (percentage of males).

Antecedents	<i>k</i>	<i>N</i>	<i>B</i>	<i>SE</i>	$\beta$	<i>p</i> -value
<b>Individual characteristics</b>						
Age ->EIB	31	12,252	-0.408	0.398	-0.172	0.306
Education ->EIB	25	9837	0.281	0.791	-0.073	0.722
Tenure ->EIB	22	7036	-0.001	0.868	0.001	0.999
Career tenure ->EIB	6	1692	0.191	0.238	0.352	0.423
Proactive personality ->EIB	3	939	1.291	1.527	-0.646	0.398
Creative self-efficacy ->EIB	16	4994	-0.828	0.383	-0.452	<b>0.031<sup>*</sup></b>
<b>Leader's leadership styles</b>						
Empowering leadership ->EIB	5	1015	1.637	0.725	0.722	<b>0.024<sup>*</sup></b>
Ethical leadership ->EIB	3	724	-0.004	0.185	-0.078	0.984
Leader-member exchange ->EIB	8	2867	0.075	0.967	0.034	0.939
Servant leadership ->EIB	5	1771	0.393	1.414	0.149	0.781
Transformative leadership ->EIB	13	5180	0.062	0.513	0.036	0.904
<b>Team characteristics</b>						
Peer support ->EIB	8	2322	-0.087	0.501	-0.072	0.862
Employee-manager relation ->EIB	5	2189	0.945	0.947	0.499	0.318
Team environment ->EIB	7	2350	0.063	0.729	0.036	0.931
Knowledge sharing ->EIB	10	3445	-0.613	0.476	-0.432	0.198
<b>Organizational characteristics</b>						
Organizational support ->EIB	11	5322	-1.108	0.446	-0.606	<b>0.013<sup>*</sup></b>
Rewards ->EIB	5	1128	0.565	2.569	0.117	0.826
Innovative climate ->EIB	8	2855	-0.809	0.689	-0.386	0.240
Co-operative culture ->EIB	16	5074	-0.219	0.554	-0.099	0.692
Employee involvement ->EIB	11	4076	-1.258	1.333	-0.319	0.345
High performance HR practices ->EIB	5	1776	0.249	0.997	0.152	0.803
<b>Work attitudes</b>						
Burnout ->EIB	9	3251	1.166	0.833	0.479	0.162
Work motivation ->EIB	15	5169	0.127	0.506	0.073	0.801
Organizational commitment ->EIB	9	2665	0.256	0.356	0.261	0.472
Perceived meaningfulness at work ->EIB	12	3493	-0.545	0.522	-0.327	0.296
Work engagement ->EIB	10	2823	0.123	0.487	0.092	0.800
Psychological empowerment ->EIB	16	4899	0.086	0.392	0.064	0.826

Note: *k* = number of studies, *N* = cumulative sample size, *B* = unstandardized coefficient, *SE* = standard error,  $\beta$  = standardized coefficient, EIB = employee innovation behaviour, <sup>\*</sup> *p* < 0.05

from researchers. It was also observed that the majority of the sampled studies were conducted in the hospitality sector, and in Asia. Hence, to supplement the current knowledge of EIB, future research could be broadened to include the tourism sector and western locations. Future researchers may also refer to the current findings to employ strong predictors of EIB when developing their theoretical models. For example, work attitude and organization characteristic variables, which were widely examined as EIB antecedents, and presented with relatively strong correlations, could be key subjects for future studies.

Second, 30 antecedents were identified in this study, and it is therefore recommended that future researchers continue the search for

additional potential antecedents of EIB, due to the current study only focusing on an insufficient number ( $K < 3$ ). For example, factors relating to team characteristics and leadership styles appear to have been largely overlooked by researchers, as evidenced by the fact that there were relatively fewer antecedents and studies in these categories. Apart from the frequently-examined factors that underwent meta-analysis in this study (i.e., leader-member exchange and transformational leadership), paternalistic leadership (Khorakian et al., 2021), leader humility, and team humility (Ye et al., 2020) have been identified as novel antecedents of EIB, implying that there is still abundant room for future researchers to complement current knowledge. For instance, social learning theory (Bandura and Walters, 1977) and social information processing theory (Walther, 1992) emphasize that individuals are able to acquire new information and values by observing the behaviors of others, such as those of their leaders and team members. It would be meaningful, therefore, to explore the influence of potential antecedents on EIB, such as leaders' technical competencies and workplace spirituality.

Moreover, research questions relating to what would promote the EIB is also a necessary topic to examine. Despite an understanding of the factors that determine EIB, identifying the source of obstructions to EIB is also crucial to researchers and practitioners; although 30 antecedents were captured in this study, 'burnout' was the only negative variable uncovered. There may have been an increase in the trend to examine the negative antecedents of EIB (e.g., 'organizational inequality', Syed et al., 2020, and 'role ambiguity', Maden-Eyiusta, 2019), but factors such as these have received less attention from researchers, with the result being that they have been excluded from the current study. Therefore, to enrich current knowledge on the topic, this study calls for more research focused on the investigation of variables that may have a negative impact on EIB.

Third, significant variations in effect sizes were found for most of the examined relations to EIB. These findings present an opportunity to explore under which boundary conditions EIB would be accentuated and attenuated. Utilizing the construal level theory (Trope and Liberman, 2003), Chang and Teng (2017) discovered that organizational prevention focus heightens the relationship between creative personality and EIB, as it can develop EIB by concentrating on safe planning and feasible strategies to prevent negative outcomes. In contrast to such organizational moderators, the current study found that some individual characteristics (e.g., national culture, age, and gender) moderate the relationship between EIB and its antecedents. Future research may wish to explore whether contextual variables (e.g., organizational, or environmental work factors) and individual variables (e.g., demographic factors and personality) may interact or even jointly interact with other factors to influence EIB (e.g., factors in the non-work domain such as family support). By doing so, it could further contribute to explaining the Q-statistics presented in the current study.

Fourth, regarding the current research design, most of the samples consisted of cross-sectional studies, which suggests that EIB is primarily understood at the between-person level. However, vocational attitudes and perceptions may change over time (Lee et al., 2016). For example, the present review found that employee age significantly and positively moderated the relationship between peer support and EIB. Future research could take this proposition into consideration and conduct within-person studies based on latent growth modelling, to examine the accelerating effect of peer support. The findings from studies that pay attention to the influence (e.g., the moderating role) of time, also help to explain the significant Q-statistics in the present study. In addition, within-person design has stronger statistical power to explain the casual mechanisms linking EIB to its antecedents. By longitudinally investigating the moderating and mediating effects, future research can enrich the current knowledge by answering the questions of both 'how' and 'when', to exhibit effective EIB.

### 5.3. Practical implications

Given that a significant number of antecedents were explored and meta-analytically examined in relation to EIB, this study provides essential practical implications for hospitality and tourism organizations. Some antecedents are more important than others from a statistical perspective—therefore, special managerial attention is required. First, employee work attitudes play an important role in cultivating EIB. In particular, the results of this study suggest that when employees perceive meaningfulness at work, they are most likely to engage in innovative behavior, i.e., when employees feel that their work is meaningful to them, they will try to use their creativity to contribute to their work, and vice versa. Hence, enhancing employees' feelings of meaningfulness at work can improve their innovative behavior. Managers can increase employees' perceptions of meaningfulness by helping them to see the bigger picture, and explaining to them how their work relates to the overall performance and goals of the organization (Ahearne et al., 2005). The results from this study also suggest that work engagement is an important antecedent to EIB. Previous meta-analysis on work engagement has provided strong evidence that perceived organizational support can foster employee work engagement (Kanjanakan et al., 2021). In order for employees to be aware that their workplace supports them, managers need to show them that they are recognized, and provide them with opportunities to share their ideas (Akgunduz et al., 2018).

Second, along with work attitudes, employee characteristics and organizational characteristics, also play an important role in nurturing EIB. Specifically, employees with creative self-efficacy, and organizations that promote an innovative climate, tend to exhibit EIB. The results suggest that organizations focusing on EIB as a competitive advantage should not only support the innovative climate but also aim to recruit employees with creative self-efficacy. This is because employees with high creative self-efficacy tend to engage more in EIB when they feel that their work environment encourages innovation and creativity (Jaiswal and Dhar, 2015).

Third, cultural background is a crucial factor in boosting EIB. The hospitality and tourism industry is not only competitive, it also operates internationally. It is important that the industry is able to effectively manage employees from diverse cultural backgrounds so that they can successfully exhibit EIB. The results of the current study suggest that work motivation is highly effective in increasing EIB among employees in collectivist cultures, while for those in individualistic cultures, employee involvement is a key factor. Managers can refer to the cultural model of Hofstede (2001) before determining their employees' cultural backgrounds and identifying specific strategies to enhance their EIB. Additionally, organizations need to be mindful of the moderating effect of age on EIB. The present study suggests that peer support is important factor in the development of EIB in older employees. Specifically, older employees may have higher EIB due to having greater work experience, but it also could be more difficult for them to assert new ideas as they tend to be more able to adjust to work routines. Hence, with the support of peers, they may have more courage to exhibit EIB. Therefore, organizations that are interested in fostering EIB should work on developing a supportive environment where peers can support each other's ideas, particularly with older employees. The result would be an organization with employees who are ready to innovatively and creatively service their customers.

Finally, organizations should be aware of how employees of differing genders react to different antecedents of EIB. When recruiting employees, creative self-efficacy is the characteristic the recruiters should be looking for from potential employees if the organization wishes to encourage EIB. However, as shown in our study, women with creative self-efficacy tend to associate more with EIB than men with creative self-efficacy. To enhance EIB, female employees are more likely to react to organizational support while male employees are more likely to react to empowering leadership. However, this does not suggest that

organizations should not support male employees and not empower female employees since these two practices are important in fostering EIB. The results of this study imply that organizations cannot ignore the crucial role that gender plays in the relationship between EIB and its antecedents.

#### 5.4. Limitations and future research

This study has some limitations that can be addressed in future research. First, as with any quantitative review which has relied heavily on the quality of the primary studies, limitations in the sample studies may apply to the findings. That is, common methods bias from the primary studies may limit the generalizability of the results. For example, the sample studies are mainly cross-sectional, which has prevented the authors from determining the causal interpretation between variables. Second, since the file-drawn problem can never be eliminated, and while the absence of publication bias was statistically demonstrated, it may still remain possible, particularly for those relations with small  $k$  and significant  $Q$ -statistics (high levels of heterogeneity). In order to further confirm the robustness of the findings, future review studies with larger sample sizes and the inclusion of more grey literature are required, to provide a more nuanced observation of heterogeneity in effect sizes and to reduce the risk of publication bias.

Third, in this study, only 'age', 'gender', and 'national culture' were tested as moderators. Future research could test 'tenure' as a moderator, given that prior research has indicated that job tenure weakens the influence of education on EIB through task performance (Yang et al., 2022). Another limitation related to our moderation analysis is that when examining the moderating role of national culture using subgroup analysis, the number of samples ( $k$ ) were unbalanced between subgroups. As the samples showed skewed toward the studies conducted in a collectivistic culture which may undermine the statistical power of the  $z$ -test and limiting the strength of its conclusions, the results may need to be interpreted with caution. While this issue is not uncommon in psychometric meta-studies (e.g., Lin et al., 2022; Miao et al., 2019; Park and Min, 2020), it underlines the need for methodologically different means to scrutinize the accuracy of the results of our subgroup analysis. Although, in the present study, meta-regression was used to address this concern, future studies are encouraged to conduct multinational and multilevel examinations that empirically measure cultural influences in order to provide more persuasive evidence.

#### References and recommended reading

Note: References marked with "\*" were involved in the meta-analysis of the present work.

#### Declaration of interests

The authors declare that they have not known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ijhm.2023.103474.

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