



# The relationships between leader emotional intelligence, transformational leadership, and transactional leadership and job performance: A mediator model of trust

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## ABSTRACT

This study utilized the hierarchical linear model and trust as a mediator; designated leader emotional intelligence as a team-level dimension; and designated transformational leadership, transactional leadership, and trust in supervisor as individual-level dimensions. An analysis was performed to explore the relationships between these individual- and team-level variables and the job performance of real estate brokers, as well as the potential role of trust-oriented leadership as a mediator for the relationships between leader emotional intelligence, transformational leadership, and transactional leadership and individual job performance. The empirical results revealed that leader emotional intelligence, transformational leadership, and transactional leadership had direct, significant, and positive relationships with individual job performance. Furthermore, it was also discovered that, with trust in supervisor serving as a mediator, these three variables also had indirect, significant, and positive relationships with employee job performance.

## 1. Introduction

Within the service industry, the housing brokerage industry is strongly affected by business cycle variations. Thornton [1] stated that employees can overcome their weaknesses based on the results of their performance appraisal, thereby increasing the job performance. In industrial organizations, leaders play a central role as they directly or indirectly influence the attitudes and behaviors of their employees. Employee job performance is also influenced by their leaders' emotional intelligence and leadership style [2], since leadership effectiveness is based on the mutual trust and interactions between supervisors and employees [3]. In traditional organizations, there are two types of leadership styles: transformational leadership, in which subordinates who agree with their supervisor's leadership approach follow their direction [4]; and transactional leadership, in which leaders make agreements with their subordinates through exchanging and bargaining, thus improving the job performance [5]. Lee et al. [6] suggested that employees who strongly identify with their leader's transformational leadership skills, ethical climate, and emotional intelligence would trust their

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supervisor more, and the influence of this perception on job performance is mediated by trust in a supervisor.

There are more than 10 real estate brokerage brands in Taiwan. In the case of Yung-Ching Realty, its efforts to improve the job performance of its employees have led to the implementation of a variety of excellent benefits, including guaranteed salaries and bonuses for the first nine months, personal performance bonuses, team bonuses, business incentive bonuses, and year-end bonuses. Among them, the team bonus is a noteworthy component as it focuses on the development of a team-based culture. With the opportunity to earn a team bonus in addition to personal job performance bonuses, employees will be more inclined to improve their own job performance. A real estate broker must possess not just professional knowledge and an affable disposition, but also the ability to address the home purchase needs of their clients. A broker also has to provide innovative services, as well as utilize technology to look up information that they can promptly share and expand upon with detailed explanations. Through these approaches, a real estate broker will be able to substantially increase the desire to purchase homes among their clients, and thereby improve their job efficiency and performance.

Job performance is a core objective for any company. A company's total revenue reflects the quality and quantity of its employees' work, as well as the results of their work, that is, their job performance [7]. In order to maintain a company's competitiveness, employees have to be willing to contribute toward the company's objectives, and in this respect, the relationship between the company and its employees plays an important role. When an employee understands the expectations, needs, and work objectives of their supervisor and the company, they will help to create a work environment that everyone accepts, resulting in both sides benefiting [8]. In other words, employee performance is directly influenced by a company's internal management, and for this reason, an employee's trust in their supervisor is a key element that influences their job performance.

Aside from trust as a factor that influences job performance, leader emotional intelligence is another factor that influences both trust and employee performance [9]. A supervisor earns a basic level of trust from their employees by displaying his wisdom, capacity for rational analysis, traits, and values when interacting with them, and the emotional intelligence of a leader is developed through their wisdom, capacity for rational analysis, and traits [10]. Law, Wong, and Song [11] argued that the inability to manage one's emotions will increase the likelihood that one will encounter problems relating to interpersonal interactions; and given that interpersonal interactions between supervisors and employees are an integral aspect of the work environment, they proposed that an individual's job performance is influenced by their emotional intelligence and the emotional intelligence of their colleagues. The results of their study showed that an employee's emotional intelligence and the emotional intelligence of their colleagues will have a significant and positive effect on their job performance. Vratskikh, Masa, Al-Lozi, and Maqableh [12] also proposed that, in the face of work stress, an employee can often work more efficiently if they receive support and feedback from others and possesses better emotional intelligence, such that they can better manage their emotions.

A leader's leadership style is also a factor that influences an employee's job performance and their trust in their supervisor. Cook and Wall [13] pointed out that a mutual exchange relationship exists between supervisors and employees; through a supervisor's positive leadership, employees will be able to identify with the supervisor, support them positively, adopt a trustful attitude at the psychological level, and consequently, give back to the company by adopting behaviors that benefit it. With respect to transformational and transactional leadership styles, it was found that the subordinates of transformational leaders will express satisfaction with their leaders [14]. Leaders who practice transformational leadership will explain their goals and visions to their employees and motivate them, such that these employees will become inspired and become more engaged in and committed to their work [15]. In other words, transformational leadership leads to better work satisfaction among employees. With the support and encouragement that they receive from transformational leaders, employees will develop trust in these leaders since they will feel valued and gain more self-confidence [16]. On the other hand, a transactional leader leverages social behaviors to maximize benefits at a low cost. Such a leader will encourage their employees to fulfill their responsibilities and understand their goals and needs, and if an employee is able to complete their work and achieve good performance, they will be rewarded. In addition, a transactional leader will establish clear standards to regulate the job content of their employees, such that employees can better understand their job scope, a relationship of trust can be formed between the leader and their employees, and better job performance can be achieved [17]. Ishaq and Abbasi [18] discussed the mediating roles job satisfaction and transformational leadership play for emotional intelligence and project success. Jung and Avolio [19] indicated that both transformational and transactional leadership indirectly influence job performance by establishing employee trust toward their leaders. These findings have demonstrated that the importance of transformational and transactional leadership in raising job performance. Lee, Li, Yeh, & Yu [20] examined the effects of leader emotional intelligence, leadership styles (transformational and transactional), organizational commitment, and trust on job performance. Structural equation modeling was used for the analysis. Lin, Lee, Yeh, & Yu [21] examined the factors (ethical climate, personality traits, and trust in supervisors) influencing the job performance of real estate brokers. Lee, Yeh, Yu, & Tsai [22] investigated the factors affecting turnover tendency of real estate brokers. The impact of individual level factors (role conflict, role ambiguity, interpersonal conflict, and emotional exhaustion) and organizational level factors (supervisor support and group trust) on turnover intentions was assessed.

In the real estate brokerage industry, employees acquire marketing and negotiation skills through their leaders' behaviors and attitudes (Suo and Kai, 2023) [23]. This highlights the importance of leadership style and trust in supervisor on brokers' job performance. This study attempts to bridge the knowledge gap regarding intra-organizational leadership styles in the real estate brokerage industry; few studies have examined this previously. We also adopted an HLM approach while considering the individual- and team-level factors of brokers to amplify the contributions of the research results. The research participants for our study consisted of real estate brokers from Kaohsiung City, and the relationship between the participants' perception of leadership styles and their job performance was examined. A hierarchical linear model (HLM; also referred to as a multiple model) was used to analyze the effects of team-level variables such as leader emotional intelligence, individual-level transformational and transactional leadership, and trust-in-supervisor on job performance. With regard to the team-level dimension, the analysis looked into the direct cross-dimensional

effects of leader emotional intelligence on individual job performance, as well as the role of trust in supervisor as a mediator, so as to determine whether leader emotional intelligence has a partial or full mediation effect on job performance. With regard to the individual-level dimension, the analysis looked into the direct effects of leadership style on job performance, as well as the role of trust in supervisor as a mediator, so as to determine whether transformational and transactional leadership have a partial or full mediation effect on job performance.

Our study enabled a better understanding of whether trust in supervisor is a mediator of the effects of transformational and transactional leadership and leader emotional intelligence on job performance, and demonstrated the importance of the relationships between transformational leadership, transactional leadership, and leader emotional intelligence for job performance. Unlike previous studies, a multilevel mediation model was utilized for the analytical framework of this study, with leadership style and trust in supervisor being designated as individual-level items, and leader emotional intelligence being designated as team-level items. The study explored the indirect effects (with trust in supervisor as a mediator) of individual-level leadership style on employee job performance, and whether team-level leadership emotional intelligence has a cross-dimensional indirect effect (with trust in supervisor as a mediator) on the individual job performance of employees.

## 2. Theoretical background

Through the enactments of the Land Administration Agent Act in 1999 and the Land Administration Agent Act in 2001, the Taiwanese government provided a legal basis for real estate sales and purchase contracts and home ownership transfers to safeguard buyer-seller transactions. Effectively regulating the safety of external transactions made it possible for business operations within an organization to profoundly influence the sustainable development of the brokerage industry. Broker compensation is commission-based, and the industry is suffering workforce shortages due to the tendency for employees to work long work hours [6]; this challenges the internal operations and business models of organizations. To attract and retain workers, most housing enterprises have adopted one-to-one professional mentorship training programs so that each newcomer has a mentor from whom they can learn [24]. The mentor's leadership style and emotional intelligence is a key determinant of employees' work performance. Therefore, in addition to enabling employees to acquire professional knowledge through leadership styles, the implicit transfer of work practices is also contingent on the trust between employees and leaders. By establishing trust, the job performance can be improved.

### 2.1. Leader emotional intelligence

Leader emotional intelligence refers to the ability to guide one's thoughts and actions through the identification and utilization of one's own or someone else's emotions and feelings [25,26]. Effective leadership is partially determined by emotional understanding and abilities relating to emotional intelligence. A corporate leader in a challenging and difficult role usually possesses better emotional intelligence, such that they are able to outperform other people at work. At the senior management level, emotional intelligence is far more important than rational intelligence, and it is the factor that makes real leaders stand out [27]. Goleman [28] proposed five functions that contribute to emotional intelligence: 1. the ability to quickly reduce stress; 2. the ability to recognize and manage one's own emotions; 3. the ability to communicate non-verbally with other people; 4. the ability to utilize humor in conflict resolution; 5. the ability to actively and confidently resolve conflicts. Leader emotional intelligence is a predictor of social relationships, workplace performance, and physical and mental health. Furthermore, emotional intelligence allows for accurate emotional inference and the utilization of knowledge regarding emotions and feelings to increase one's thinking ability, which, in turn, influences one's family relationships and relationships with other relatives and friends. Shahhosseini et al. [29] pointed out that emotional intelligence can be used to raise the job performance of managers and their subordinates, as well as organizational effectiveness.

### 2.2. Transformational leadership and transactional leadership

Transformational leaders leverage their exceptional charisma to motivate employees and satisfy their emotional needs, and as a result, employees are able to think beyond themselves and work on forming a good team [30]. MacKenzie et al. [15] argued that a transformational leader provides personalized support to their employees, through which their opinions are accorded respect and their feelings and needs are taken into consideration; in this manner the leader supports their employees' career development, resulting in a significant and positive relationship with their performance. Transformational leaders establish team spirit through their passion for work, high ethical standards, integrity, and optimism; they inject meaning and challenge into their employees' work in order to improve their self-efficacy, self-confidence, and decision-making ability, and to make their work more meaningful [31]. Rank, Nelson, Allen, and Xu [32] indicated that a transformational leadership style can help employees with low self-presentation to change their attitudes and thinking, such that their work motivation and job performance are raised. Hussain, Shujahat, Malik, Iqbal, and Mir [33] argued that transformational leadership can motivate and influence employees, allowing them to prioritize the organization's goals over their own interests. As a relationship between leaders and their employees, transactional leadership is a relationship based on transactions. When employees act according to their leader's wishes, they are reward to a certain extent [34]. Konovsky and Pugh [35] proposed that transactional leadership may lead to the perception among employees that they are merely engaging in an economic exchange with the organization, leading these employees to overemphasize the rewards they get for achieving targets. A transactional leader uses rewards to motivate their employees to fulfill their work responsibilities, and implements penalties to correct the deviant workplace behavior [36]. As a leadership style, transactional leadership can effectively raise employee motivation [37,38].

### 2.3. Trust in supervisor

Higher trust leads to less uncertainty and risk, and lower trust produces the opposite results [39]. Trust-in-supervisor has been defined as a mental state that is adopted by employees in risky situations and characterized by positive expectations regarding the leadership's intentions and behaviors [40–42]. Trust-in-supervisor directly influences organizational commitment, organizational citizenship behavior, and job performance [43]. Bennis and Nanus [44] proposed that trust is a lubricant that enables an organization to operate, and stressed the importance of this concept for effective leadership. A trusted leader can indirectly influence the behavior and performance of their employees through their perceptions of their characteristics [45]. When employees trust a leader, they are able to identify with the organization and become motivated to work harder, leading to better job performance [46]. Mo and Shi [47] argued that trust-in-supervisor has a positive effect on employee job performance, and that a lack of trust will result in employees becoming fearful of communicating with their leaders or openly expressing their real feelings, and consequently, the formation of negative emotions and a negative atmosphere within an organization.

Reddin [48] described job performance as the degree to which employees achieve the objectives in their work tasks. Lee and Shen [49] found that organizational structure, employee satisfaction, and organizational commitment all had positive and significant influences on job performance in the brokerage industry. Weng and Li [50] reasoned that transformational leadership is based on the trust between supervisors and employees. Supervisors who exhibit stronger transformational leadership behaviors gain more trust from their employees, thus improving job performance. Lee et al. [6] examined the influences of transformational leadership, transactional leadership, ethical climate, and emotional intelligence on the job performance of real estate brokers in Kaohsiung City, with trust in supervisor as a mediator variable. A total of 496 valid responses were received from the 970 questionnaires administered. Parameter estimation was performed through a hierarchical linear mediation analysis which showed that the influences of transactional leadership, ethical climate, and emotional intelligence on job performance were all mediated by trust in supervisor.

## 3. Literature review and research hypotheses

### 3.1. Individual-level relationships

MacKenzie, Podsakoff and Rich [15] pointed out that transformational leadership will lead to better-than-expected behavior among employees. When employees feel that their expectations and needs have been met, they will be fully committed to their work. Dvir, Eden, Avolio, and Shamir [51] indicated a transformational leader is able to establish closer relationships with their employees, resulting in these employees achieving better job performance. When an organization provides opportunities for advancement, employees will put more effort into their work [52]. Hussain, Shujahat, Malik, Iqbal, and Mir [33] indicated that a transformational leader ensures the commitment of their employees toward their roles at work through the application of intellectual stimulation, individualized consideration, idealized influence, and inspirational motivation, which, in turn, raises their trust and job performance. Buil, Martínez, and Matute [53] indicated that a transformational leader actively encourages their employees to engage in desired behaviors, so as to increase their sense of self-interest, improve their innovative and creative capabilities, and inspire them to perform beyond expectations. For this reason, transformational leadership has a significant and positive relationship with employee and job performance [39,54–56]. Hypothesis H1 is proposed as follows:

**H1.** Transformational leadership has a significant and positive relationship on job performance

Jameel and Ahmad [57] noted that leadership style can affect the performance of academic staff. In addition, job satisfaction can mediate the effect of leadership style on the performance of academic staff. MacKenzie, Podsakoff and Rich [15] proposed that transactional leadership has a significant and positive impact on the in-role and extra-role performance of employees. Nanjundeswaraswamy and Swamy [58] pointed out that a transactional leader relies on “transactions,” so as to encourage their employees to work hard for rewards and to meet their targets and/or performance standards. Under transactional leadership, employees' contributions and failures are rewarded and penalized, respectively, and their performance, as well as their future rewards and penalties, are determined by their job performance [59]. Franco and Matos [60] indicated that organizations dealing with simpler and well-defined problems are better off utilizing transactional leadership since it is more effective in this case. Judge and Piccolo [61], and Masa' deh, Obeidat, and Tarhini [38], also indicated that transactional leadership will have a positive impact on employee job performance. Basri, Rashid, Abashah, and Samah [62] examined private pharmacies in Malaysia and found that transactional leadership has a significant and positive impact on job performance. Hypothesis H2 is proposed as follows:

**H2.** Transactional leadership has a significant and positive relationship with job performance

**Cross-level relationship.** From a theoretical perspective, a more feasible approach for examining the impact of emotional intelligence on job performance is to regard job performance as an important organizational goal and emotional intelligence as an important influencing factor in maintaining top performance and competitive advantages [29]. A leader's emotional intelligence can facilitate success at the workplace, indicating that correlation between career success and leader emotional intelligence. Doan, Nguyen, and Nguyen [63] showed that emotional intelligence made projects more successful. Since emotional intelligence can help an individual to understand their and other people's emotions, it is useful in social interactions and has a positive effect on job performance [64]. Pryke, Lunic, and Badi [65] argued that, when engaging in team communication, the emotional intelligence of a construction project manager plays an important role in their communication with their subordinates; they also argued that a good project manager is a key factor in the success of a project. With respect to social skills, Law, Wong, and Song [11] proposed that interpersonal communication is a fundamental component for many jobs, and that an individual's application of emotional intelligence reflects their

ability to engage in emotional expression; an individual with stronger emotional intelligence can actively raise their performance and redirect negative emotions, such that constructive performance-related goals can be established. Heffernan, O'Neill, Travaglione, and Droulers [66] indicated that the emotional intelligence of a bank's managers will have a significant and positive impact on the bank's financial performance. Hypothesis H3 is proposed as follows:

**H3.** Leader emotional intelligence has a significant and positive relationship with job performance

**Trust in supervisor as a mediator variable.** Alrowwad and Abualoush [67] discussed the mediating effect of intellectual capital and innovation on the relationship between transformational and transactional leadership and organizational performance. Weng and Lee [68] argued that a supervisor who practices transformational leadership will respect and value their subordinates, become capable of tapping their subordinates' potential and vision, and thus, establish trust with them through the intangible encouragement that they provide. Braun, Peus, Weisweiler, and Frey [16] proposed that transformational leadership stresses trust among members and trust in the manager. Jung and Avolio [19] indicated that transformational leadership has a strong and direct impact on job performance, as well as a strong indirect impact on job performance through the mediating effect of trust. Asencio and Mujkic [69] pointed out that a leader who engages in transformational leadership behavior will gain the trust of their employees. Thus, in public organizations, the perceptions of transformational leadership behavior among employees will have a significant and positive impact on their perceptions of trust in managers. Hussain, Shujahat, Malik, Iqbal, and Mir [33] indicated that transformational leadership affects employees' trust in their leader via cognitive trust and affective trust. Cai, Loon, and Wong [70] proposed that transformational leadership has a significant and positive impact on trust in the management. Braun, Peus, Weisweiler, and Frey [71] and Liu, Siu, and Shi [72] both used trust in supervisor as a mediator variable to examine the effect of transformational leadership on job satisfaction. The authors suggested that transformational leadership positively influenced trust in supervisor. Hypothesis H4 is proposed as follows:

**H4.** Transformational leadership has a significant and positive relationship with trust in supervisor

MacKenzie, Podsakoff, and Rich [15] argued that transactional leadership behavior (contingent rewards and penalties) will significantly increase salespeople's trust in their sales manager. Jung and Avolio [19] explored the mediation effect of trust in supervisor with respect to transactional leadership and job performance, and discovered that transactional leadership has a significant and positive impact on trust in supervisor, and can indirectly influence job performance through trust in supervisor and value consistency. Asencio and Mujkic [69] proposed that a leader who exhibits transaction leadership will gain more trust from their employees, such they will trust their intentions and behavior. In other words, employees' perceptions of transactional behavior will significantly and positively influence their trust in their managers. Cai, Loon, and Wong [70] also proposed that transactional leadership will have a significant and positive impact on trust in management. Examining the influence of transactional leadership on organizational change capacity, Yasir, Imran, Irshad, Mohamad, and Khan [73] used employees' trust in their supervisor as a mediator variable. The authors suggested that transactional leadership positively influenced trust in supervisor. Hypothesis H5 is proposed as follows:

**H5.** Transactional leadership has a significant and positive relationship with trust in supervisor

Schlechter and Strauss [74] argued that a team leader's emotional intelligence will have a significant and positive impact on trust in supervisor. The empirical results from Sheehan's [75] study showed that proper emotional management can promote trust, loyalty, commitment within a team. A study by Huggins, White, and Stahl [76] revealed that a leader with higher emotional intelligence will be able to build a stronger relationship of trust with their employees, leading to stronger work motivation and sales performance among these employees. Furthermore, the development of trust between employees and a supervisor requires the latter to possess a high level of emotional intelligence. They also believed that the emotional intelligence of a supervisor has a direct impact on work motivation and sales performance, however, the supervisor's emotional intelligence can also influence work motivation and job performance via trust. Ding, Tian, Yang, and Gong [77] argued that a leader with higher emotional intelligence will gain more trust from their employees. Hypothesis H6 is proposed as follows:

**H6.** Leader emotional intelligence has a significant and positive relationship with trust in supervisor

Plank and Reid [78] argued that trust has a significant and positive impact on job performance. Trust is an important driver of sales performance and also influences the perceptions that buyers have of salespeople. Jong and Elfring [79] pointed out that trust has a significant and positive effect on job performance, and also influences job performance through team supervision and team effort. Huang [80] indicated that employees' trust in upper management can have a significant and positive impact on job performance through feedback search behavior. Chughtai, Byrne, and Flood [81] proposed that employees who trust their leader will become more confident, and consequently, put more effort into their work. This is because they know that their leadership will support them in their efforts to resolve the problems they encounter at work. Trust in supervisor has a significant and direct impact on job performance [47]. Braun, Peus, Weisweiler, and Frey [71] found that trust in supervisor positively influenced job satisfaction and team performance. Chong and Law [82] agreed that trust in supervisor positively influenced job performance. Hypothesis H7 is proposed as follows:

**H7.** Trust in supervisor has a significant and positive relationship with job performance

Based on H1, H4, and H7 mentioned above, as well as H2, H5, and H7, two individual-level 1-1-1 mediation models are formed, in which trust in supervisor plays the role of the mediator variable: "individual-level transformational leadership influences the trust of brokers in their supervisors, which in turn influences their job performance," and "individual-level transactional leadership influences the trust of brokers in their supervisors, which in turn influences their job performance." In addition, based on H3, H6, and H7, a cross-level 2-1-1 mediation model is formed, in which trust in supervisor plays the role of the mediator variable: "team-level leader emotional intelligence influences the trust of brokers in their supervisors, which in turn influences their job performance." Three more



hypotheses are proposed:

**H8.** The significant and positive relationship between transformational leadership and job performance is influenced by the mediation effect of trust in supervisor

**H9.** The significant and positive relationship between transactional leadership and job performance is influenced by the mediation effect of trust in supervisor

**H10.** The significant and positive relationship between leader emotional intelligence and job performance is influenced by the mediation effect of trust in supervisor

**4. Research method**

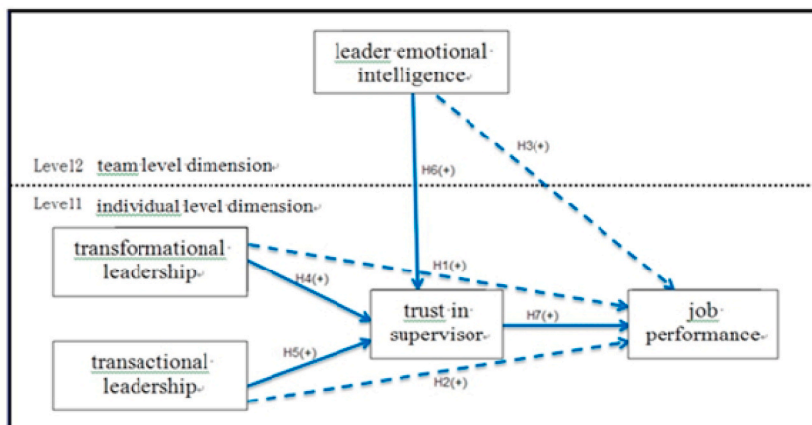
Firstly, the research framework and research hypotheses are proposed (refer to Fig. 1); secondly, the multilevel mediation empirical model is explained; thirdly, the questionnaire design is explained; and finally, the study samples are collected. The research has obtained the informed consent of all participants. This study carried out further analysis and verification through hierarchical linear modeling (HLM), mainly due to the hierarchical concept inherent in HLM, which includes individual levels and macro levels. If analysis is carried out through the traditional regression model, only correlations among single-level variables will be accounted for, while influences at different levels will be neglected. The use of HLM can classify variables into appropriate units for analysis, thereby avoiding problems such as estimation bias and inference error [83]. We focused on individual job performance rather than team job performance in each branch office. The first-level dependent variables in HLM were also individual job performance as opposed to team job performance in each branch office in the second level. Based on the HLM settings and analysis, we are currently unable to perform analyses using team job performance as a dependent variable.

**4.1. Research framework**

In this study, the multilevel mediation model is based on leader emotional intelligence, transformational leadership, and transactional leadership as independent variables, trust in supervisor as the mediator variable, and job performance as the dependent variable (outcome variable). The dotted line indicates a direct correlation and the solid line indicates an indirect correlation.

**4.2. Empirical model**

**Analysis strategy and levels.** Based on multilevel mediation models of two-level data structures (such as the 1→1→1, 2→1→1, or 2→2→1 design) proposed by Krull and MacKinnon [84,85], the mediation models adopted in this study were the 1→1→1 and 2→1→1 models. The three digits represent independent variables, mediator variables, and outcome variables respectively. This study included two mediation models of the 1→1→1 design: (1) transformational leadership → trust in supervisor → job performance; and (2) transactional leadership → trust in supervisor → job performance. The multilevel mediation model was adopted to carry out analysis on the correlations among the independent variables (transformational leadership and transactional leadership), mediator variable (trust in supervisor), and outcome variable (job performance). Also, each variable in this design was located on the first level (individual level) of the data structure, which indicates that each variable on this level can express the opinions and values of every person from various teams. Another mediation effect model of the 2→1→1 design (leader emotional intelligence → trust in supervisor → job performance) was also adopted in this study, where multilevel analysis was similarly carried out on the correlations among the independent variable (leader emotional intelligence), mediator variable (trust in supervisor), and outcome variable (job performance).



**Fig. 1.** Job performance concept framework diagram.

In this design, the independent variable was located on the second level (group level), while the mediator variable and outcome variable were located on the first level.

4.2.1. Null model

This study adopted two variables on the first level, individual job performance and trust in supervisor, as dependent variables. First of all, prior to HLM analysis, the null model must be tested to determine whether significant differences exist in the job performance (PERFORMANCE) and trust in supervisor (TRUST) within branch offices and between branch offices, and to estimate how much of the variances in individual job performance or trust in supervisor were caused by differences across branch offices. The model is shown in equations (1)–(4):

Level 1

$$PERFORMANCE_{ij} = \beta_{0j} + r_{ij} \tag{1}$$

Level 2

$$\beta_{0j} = \gamma_{00} + u_{0j} \tag{2}$$

Here,  $PERFORMANCE_{ij}$  represents the individual job performance of the  $i$ th individual of the  $j$ th branch office.  $\beta_{0j}$  represents the mean value of the individual job performance of the  $j$ th branch office.  $r_{ij}$  represents the within-group error term, where the mean value is 0 and the variance of  $\sigma^2$  has an independent and homogeneous normal distribution.  $\gamma_{00}$  represents the grand mean value of the mean individual job performance for each branch office.  $\mu_{0j}$  represents the difference between the mean individual job performance for each branch office and the grand mean of the mean individual job performance for each branch office.  $u_{0j}$  represents the between-group error term, which is independent and obeys a mean value of 0.  $\gamma_{00}$  represents the variance, which has an independent and homogeneous normal distribution. The assumptions  $r_{ij}$  and  $\mu_{0j}$  are independent from each other.

The null model is a one-way random effects analysis of variance that can calculate the ICC ( $ICC = \frac{\tau_{00}}{\tau_{00} + \sigma^2}$ ) of the null model, to verify whether the key conditions of HLM are performed. If the ICC is greater than or equal to 0.05, it is necessary to consider adopting HLM for analysis [86].

Level 1

$$TRUST_{ij} = \beta_{0j} + r_{ij} \tag{3}$$

Level 2

$$\beta_{0j} = \gamma_{00} + u_{0j} \tag{4}$$

Here,  $TRUST_{ij}$  represents the perception of trust in supervisor of the  $i$ th respondent of the  $j$ th branch office.  $\beta_{0j}$  represents the mean value of the perception of trust in supervisor of the  $j$ th branch office.  $r_{ij}$  represents the within-group error term, where the mean value is 0 and the variance of  $\sigma^2$  has an independent and homogeneous normal distribution.  $\gamma_{00}$  represents the grand mean value of the mean level of trust in supervisor for each branch office and the grand mean of the mean level of trust in supervisor for each branch office.  $\mu_{0j}$  represents the between-group error term, which is independent and obeys a mean value of 0.  $\tau_{00}$  represents the variance, which has an independent and homogeneous normal distribution. The assumptions  $r_{ij}$  and  $\mu_{0j}$  are independent from each other.

4.2.2. Hierarchical linear mediation model

Next, the design of the hierarchical linear mediation models is considered, and the intercept on the first level is set up based on random effect. These include, (1) transformational leadership → trust in supervisor → job performance; (2) transactional leadership → trust in supervisor → job performance; and (3) leader emotional intelligence → trust in supervisor → job performance, where all of the models above adopt trust in supervisor as a mediator variable. In terms of methods of verification for mediation effects, the method of regression coefficients testing, the Sobel test, and the difference-in-coefficients method are frequently used, where the method of regression coefficients testing proposed by Baron and Kenny [87] is relatively common. This study is based on Baron and Kenny’s [87] three-step verification method. In the first step, the relationships between the independent variables and the dependent variable is first determined, that is, the relationships between transformational leadership (TRANSFORM), transactional leadership (TRANSACT), and leader emotional intelligence (LEAEMO) and job performance (PERFORMANCE), as shown in equations (5)–(7). In the second step, the relationship of the independent variables on the mediator variable is determined, that is, relationships between transformational leadership (TRANSFORM), transactional leadership (TRANSACT), and leader emotional intelligence (LEAEMO) and trust in supervisor (TRUST), as shown in equations (8) and (9). In the final step, the relationships between transformational leadership (TRANSFORM), transactional leadership (TRANSACT), and leader emotional intelligence (LEAEMO) and job performance (PERFORMANCE) under the influence of additional variables is estimated, as shown equations (11)–(13). Gender (SEX), number of working years (EXP) and business type (TYPE) are control variables. First step:

Level 1

$$PERFORMANCE_{ij} = \beta_{0j} + \beta_{1j}TRANSFORM_{ij} + \beta_{2j}TRANSACT_{ij} + \beta_{3j}SEX_{ij} + \beta_{4j}EXP_{ij} + r_{ij} \tag{5}$$

Level 2

$$\beta_{0j} = \gamma_{00} + \gamma_{01}LEADEMO_j + \gamma_{02}TYPE_j + u_{0j} \tag{6}$$

$$\beta_{kj} = \gamma_{kk}, k = 1 \sim 4 \tag{7}$$

Here,  $\beta_{0j}$  represents the intercept on the first level.  $\beta_{1j} \sim \beta_{4j}$  represent the coefficients of the independent variables on the first level.  $\gamma_{00}$  represents the grand mean value of the level of job performance.  $\gamma_{01}$  represents the coefficient of leader emotional intelligence (LEADEMO).  $\mu_{0j}$  represents the between-group error term, which is independent and obeys a mean value of 0.  $\tau_{00}$  represents the variance, which has an independent and homogeneous normal distribution. Equation (7) is based on fixed effects and contains no random error term. The results of estimation from equations (5)–(7) are shown in Model 1 in Table 3 below. If  $\gamma_{11}$ ,  $\gamma_{22}$ , or  $\gamma_{01}$  reach a level of significance, the second step of estimation is then performed.

Level 1

$$TRUST_{ij} = \beta_{0j} + \beta_{1j}TRANSFORM_{ij} + \beta_{2j}TRANSACT_{ij} + \beta_{3j}SEX_{ij} + \beta_{4j}EXP_{ij} + r_{ij} \tag{8}$$

Level 2

$$\beta_{0j} = \gamma_{00} + \gamma_{01}LEADEMO_j + \gamma_{02}TYPE_j + u_{0j} \tag{9}$$

$$\beta_{kj} = \gamma_{kk}, k = 1 \sim 4. \tag{10}$$

**Table 1**  
Questionnaire items and reference sources.

Measurement construct	Questionnaire item	Reference source
<b>1. Leader emotional intelligence</b>		
Leader emotional intelligence	Emotional recognition for others	1. I feel that the supervisor can sense the emotions of employees. 2. I feel that the supervisor can identify the inner feelings of employees through conversation.
	Emotional use	1. I feel that the supervisor frequently sets goals for employees and makes an effort to accomplish them. 2. I feel that the supervisor frequently provides employees with encouragement when they encounter difficulties.
	Emotional self-management	1. I feel that the supervisor can control his temper and deal with problems rationally. 2. I feel that the supervisor has good control and management over their emotions.
<b>2. Transformational leadership</b>		
Transformational leadership	Idealized influence	1. The supervisor shares with us the values and beliefs that he finds important. 2. I feel that the supervisor has firm ambitions.
	Inspirational motivation	1. I feel that the supervisor will provide me with sustained encouragement. 2. The supervisor expresses their confidence and expectations for me.
	Intellectual stimulation	1. The supervisor encourages me to express my thoughts and opinions. 2. The supervisor encourages me to raise questions and reflect constantly.
	Individualized consideration	1. I feel that the supervisor will be concerned about problems I encounter at work. 2. I feel that the supervisor will be willing to make time to extend guidance to employees.
<b>3. Transactional leadership</b>		
Transactional leadership	Material and personal rewards	1. The supervisor responds positively when I perform well. 2. The supervisor shows me special commendation when I meet higher performance demands. 3. The supervisor informs me of the rewards from completing my work.
	Managing by exception	1. I feel that the supervisor will monitor my inadequacies at work. 2. I feel that the supervisor will pay attention to those employees whose performance does not meet standards.
<b>4. Trust in supervisor</b>		
Trust in supervisor	1. I feel that the supervisor will treat me fairly. 2. I believe that the supervisor is ethical. 3. I feel that the supervisor will not deceive employees for personal benefit. 4. I feel that my supervisor will keep their promises. 5. I believe that my supervisor's motivations and intentions are good.	
<b>5. Job performance</b>		
Job performance	Contextual performance	1. I feel that I can overcome difficulties at work. 2. I take initiative in resolving problems at work. 3. I work hard even in the absence of my supervisor.
	Task performance	1. I look forward to being assigned challenging work. 2. I feel that my average work efficiency is relatively high. 3. Overall, I can complete tasks required by the company well.



The results of estimation from equations (8)–(10) are shown in Model 2 in Table 3 below. If  $\gamma_{11}$ ,  $\gamma_{22}$ , or  $\gamma_{01}$  reach a level of significance, the third step of estimation is then performed.

Level 1

$$PERFORMANCE_{ij} = \beta_{0j} + \beta_{1j}TRANSFORM_{ij} + \beta_{2j}TRANSACT_{ij} + \beta_{3j}TRUST_{ij} + \beta_{4j}SEX_{ij} + \beta_{5j}EXP_{ij} + r_{ij} \quad (11)$$

Level 2

$$\beta_{0j} = \gamma_{00} + \gamma_{01}LEADEMO_j + \gamma_{02}TYPE_j + u_{0j} \quad (12)$$

$$\beta_{kj} = \gamma_{kk}, k = 1 \sim 5 \quad (13)$$

The results of estimation from equations (11)–(13) are shown in Model 3 in Table 3 below. If  $\gamma_{33}$  does not reach a level of significance, no mediation effects exist; if  $\gamma_{33}$  reaches a level of significance, and  $\gamma_{11}$ ,  $\gamma_{22}$ , or  $\gamma_{01}$  reach a level of significance, partial mediation effects exist; if  $\gamma_{33}$  reaches a level of significance, and  $\gamma_{11}$ ,  $\gamma_{22}$  or  $\gamma_{01}$  does not reach a level of significance, full mediation effects exist.

## 5. Questionnaire design

The questionnaire used in this study was divided into two parts. The first part consisted of basic information of the respondents, including gender, age, number of working years as a real estate broker, and annual income. The second part consisted of questions concerning the variables of leader emotional intelligence, transformational leadership, transactional leadership, trust in supervisor, and job performance (Table 1). Based on studies by Davies et al. [88] and Law, Wong, and Song [10], leader emotional intelligence is divided into three sub-aspects of emotional recognition for others, emotional use, and emotional self-management, where two questions were designed for each sub-aspect, forming a total of six questions. Based on studies by Hinkin and Tracey [89]; Hartog, Muijen, and Koopman [90]; and MacKenzie, Podsakoff and Rich [15], transformational leadership is divided into four sub-aspects of “idealized influence,” “inspirational motivation,” “intellectual stimulation,” and “individualized consideration,” where two questions were designed for each sub-aspect, forming a total of eight questions. Based on the study by Pearce and Sims [91], transactional leadership is divided into two sub-aspects of material and personal rewards and managing by exception, where three and two questions were designed for each sub-aspect respectively, forming a total of five questions. Based on studies by MacKenzie, Podsakoff, and Rich [15] and Krot and Lewicka [92], five questions were designed for trust in supervisor. Based on the study by Motowidlo and Van Scotter [7], job performance is divided into two sub-aspects of contextual performance and task performance, where three questions were designed for each sub-aspect, forming a total of six questions. This study is designed based on the Likert 5-point scale, with the level of agreement divided into five levels of strongly disagree, disagree, neutral, agree, and strongly agree, with each level carrying 1 to 5 points. (see Appendix 1).

### 5.1. Data collection, descriptive statistics and data processing

#### 5.1.1. Data collection

The scope of this study covered areas in Kaohsiung City where real estate brokers are distributed in greater concentration. There are a total of 11 franchise real estate brokerage brands in Kaohsiung City, including Taiching Realty, Taiwan Real Estate, Yung-Ching Realty, H&B Housing, Chinatrust Real Estate Co., Sinyi Realty, U-trust, Pacific Rehouse, Great Home Realty, ETWARM, and Century 21 Real Estate. The areas surveyed are the eight districts of Fengshan, Qianzhen, Lingya, Sanmin, Gushan, Qianjin, Zuoying, and Xinxing. In consideration of the convenience of transportation, this study prioritized real estate brokerage firms that were concentrated in single areas as survey respondents, while firms located in more remote areas were excluded and replaced by other firms. Based on the number of branch offices for each firm, the number of branch offices of each firm to be surveyed was determined by proportional sampling, followed by surveying the real estate brokers at each office. The survey method adopted was to distribute questionnaires to each brokerage firm onsite, which were collected three days after distributing in consideration for the busy work schedules of the real estate brokers. The survey period ran from May 1st, 2018 to June 1st, 2018. During sample selection, the intended sample size must be considered because it affects the accuracy of the estimation results. Assuming a tolerable error  $d$  of 0.05 and a level of significance  $\alpha$  of 10%, 271 is the required sample size at a 90% confidence interval. The number of valid responses obtained in this study was 367, which met the minimum sample size requirement. In this study, there were 97 branch offices at which questionnaires were actually distributed, with 10 questionnaires distributed at each branch office. A total of 970 questionnaires were distributed. There were 69 branch offices at which questionnaires were actually collected. A total of 411 questionnaires were collected, excluding eight branch offices that returned two or fewer questionnaires. There was a total of 44 invalid questionnaires and 367 valid questionnaires, with an effective response rate of 37.8%.

To verify whether the variables in this study met the assumption of normality, we set test criteria of an absolute skewness (S) coefficient less than 3 and an absolute kurtosis (K) coefficient less than 10. The results showed that the absolute values of both coefficients met the normality requirements. Because the maximum likelihood method requires normality, some scholars have proposed using the asymptotically distribution-free (ADF) method instead. However, the ADF method requires a large sample size, larger than 1,000, as Diamantopoulous and Siguaw [93] and Olsson et al. [94] suggested, or its estimation results become imprecise. Boomsma and Hoogland [95] suggested that under non-normal distributions, the ML method offers better statistical features for larger models

(those with more than six observable variables) than other methods.

### 5.1.2. Descriptive statistics

Among the valid samples, men accounted for 52.9% (194 people) of respondents and women accounted for 47.1% (173 people) of respondents. The mean age of respondents was 39 years old, where the youngest respondent was 20 years old and the oldest respondent was 69 years old. In terms of marital status, married respondents accounted for 50.4% (184 people), unmarried respondents accounted for 45.5% (166 people), and respondents of other marital statuses accounted for 4.1% (15 people). In terms of education level, university-level respondents (including four- and two-year programs) accounted for the highest proportion of respondents at 50.7% (186 people), followed by respondents with high school (vocational) education or below who accounted for 25.9% (95 people), and respondents with specialized education who accounted for 19.3% (71 people), and finally, respondents with master's degrees and above accounted for 4.1% (15 people). In terms of number of working years, respondents with less than 1 year and 1–3 years of experience accounted for the highest proportion at 18.8% (69 people) and 32.7% (120 people) respectively, followed by respondents with 4–6 years of experience who accounted for 18.5% (68 people). In terms of company positions, respondents in agent positions (brokers, salespeople) accounted for the highest proportion at about 82.3% (302 people), followed by respondents in administrative positions who accounted for about 9.8% (36 people). In terms of company business model, franchises were the dominant model, accounting for about 80.3% (49 branch offices), while direct sales accounted for about 19.7% (12 branch offices). In terms of average annual income in the last three years, respondents with an average annual income of less than NT\$300,000 and in between NT\$310,000 and NT\$500,000 accounted for the highest proportions at 28.1% (99 people) and 27.8% (98 people), respectively, followed by respondents with an average annual income in between NT\$510,000 and NT\$700,000, who accounted for 21.6% (76 people).

## 5.2. Data processing

### 5.2.1. Problem of non-response bias

The problem of non-response bias refers to the problem of whether the distribution patterns of the actual questionnaire survey samples collected are consistent with the population data structure. Based on the non-response bias test process proposed by Armstrong and Overton [96], the 367 questionnaires collected in this study were divided into two groups based on the numbered order of the questionnaires, with 180 questionnaires in the first group and 187 questionnaires in the second. The population background data (such as gender, marital status, and education level) of the two groups was tested for difference and no significant differences were found between the two groups, thus indicating no severe non-response bias in this study.

### 5.2.2. Common method variance (CMV)

In this study, the variables were self-reported by brokers. To verify that the results were not influenced by common method variance, we followed [97] methods and applied Harman's single-factor test. Principal component analysis was used to extract four principal components with eigenvalues larger than 1, of which the first component explained 60.45% of the variance of all items. Therefore, CMV was not severe in the measured items.

### 5.2.3. Reliability and validity

The factor loadings of all variables in this study were greater than 0.8 and achieved a 1% level of significance, thereby demonstrating a high level of convergence. The composite reliability of each variable was also greater than 0.6 (see Appendix 2). In terms of discriminant validity, the square roots of the average variance extracted (AVE) in the diagonals were all greater than the correlation coefficient between each variable, indicating that the discriminant validity between each variable was sufficient (see Appendix 3).

### 5.2.4. Control variables

In the process of analysis for each regression model, the impact of control variables (gender, number of working years, and business type) must be considered. Men and women have different levels of emotional control and thought patterns at work, and thus display different levels of job performance. Studies have shown that respondents whose gender roles tended towards the feminine fared more poorly in terms of job performance [98]. Due to differences in the physical and mental conditions of men and women, differences in the nature of work can also influence job performance. Erickson [99] believed that women fare better than men in terms of emotional control and family work. In summary, the different thought and behavioral patterns of different genders of employees can influence their performance at work. Thus, gender is set up as a control variable in the model.

The number of working years refers to work experience. Those with a greater number of years of experience accumulated and higher quality of knowledge and skills at work display a higher level of job performance than those with lower levels of work experience [100]. Many companies also adopt the number of working years as a standard for promotion. Quinones, Ford, and Teachout [101] pointed out that accumulated years of work experience can effectively improve performance at work. Thus, the number of working years is also set up as a control variable.

Zumpano, Elder, and Anderson [102] pointed out that the size of a business constitutes an important factor affecting business performance. Elder and Crellin [103] believed that most brokerage firms are unable to attain economies of scale due to the small scale of operations. Martin [104] believed that adopting the approach of operating as a franchise can allow a company to attain economies of scale in a short period of time. Apart from greater visibility, the franchise system can also provide higher service quality and improve the company's business performance [105]. Thus, the business model is also set up as a control variable.

5.2.5. Aggregation problem

The data on leader emotional intelligence data collected in this study is considered a shared construct, where the data collected comes from individual real estate brokers. In processing data from a shared construct, Klein, Dansereau, and Hall [106] pointed out that it is necessary to determine the suitability of individual variables aggregating into a macro level before performing cross-level analysis. There are 61 branch offices on the second level of this study, where the value of leader emotional intelligence worked out to be between 0.987 and 0.999 after calculation, with a mean value of 0.993. As long as the value is greater than 0.7, it is acceptable for individual scores to be aggregated into group scores. Since the value of leader emotional intelligence in this study is greater than 0.7, this indicates that individual variables may be aggregated into a macro level.

In order to further verify the validity of aggregating individual variables, it is also necessary to test for between-group difference. The intraclass correlation coefficient (ICC (2)) is used, which indicates the level of credibility of the group mean value of individual data used as a contextual variable indicator, as well as the level of heterogeneity between groups. Dixon and Cunningham [107] pointed out that if the ICC (2) value is greater than 0.7, this indicates that the group mean value of individual data used as a contextual variable indicator possesses high credibility, and that there is significant difference between the mean scores of each group. The ICC (2) value calculated in this study is 0.894, indicating that the group mean value of individual data used as a contextual variable indicator possesses credibility, and that there is interclass heterogeneity. Aside from this, Dixon and Cunningham [107] also use the F-test to test for interclass heterogeneity. The F-test was adopted in this study to test for interclass heterogeneity, and the test results showed that interclass heterogeneity does exist.

6. Empirical results

The outcome variables on the first level are job performance and trust in supervisor. Firstly, it is necessary to verify whether significant difference exists in individual job performance and trust in supervisor within branch offices and between branch offices, and estimate how much of the total variation in individual job performance or trust in supervisor is caused by differences between branch offices. Based on results shown in Table 2, in terms of the random effects of individual job performance, the estimated variance worked out to be 0.035, attaining a level of significance of 1%, indicating significant difference in individual job performance between branch offices. The intraclass correlation coefficient worked out to be  $0.035 / (0.035 + 0.381) = 0.084$ , indicating a variation of 8.40% in individual job performance between groups (between branch offices), and a variation of 91.60% within groups (within branch offices). In terms of the random effects of trust in supervisor, the estimated variance worked out to be 0.084, attaining a level of significance of 1%, indicating significant difference in trust in supervisor between branch offices. The intraclass correlation coefficient worked out to be  $0.084 / (0.084 + 0.322) = 0.207$ , indicating a variation of 20.70% in trust in supervisor between groups (between branch offices), and a variation of 79.30% within groups (within branch offices). Thus, further analysis and estimation may be carried out through HLM.

As shown in Table 3 and Fig. 2, in the results of estimation in Model 1, the estimated coefficient for transformational leadership is 0.242, attaining a level of significance of 1%. This indicates that the higher the perceptions of transformational leadership by real estate brokers, the higher their job performance. The empirical results are in support of Hypothesis 1. The estimated coefficient for transactional leadership is 0.361, attaining a level of significance of 1%. This indicates that the higher the perceptions of transactional leadership by real estate brokers, the higher their job performance. The empirical results are in support of Hypothesis 2. The estimated coefficient for leader emotional intelligence is 0.191, attaining a level of significance of 5%. This indicates that the higher the perceptions of leader emotional intelligence by real estate brokers, the higher their job performance. The empirical results are in support of Hypothesis 3.

In the results of estimation in Model 2, the estimated coefficient for transformational leadership is 0.364, attaining a level of significance of 1%. This indicates that the higher the perceptions of transformational leadership by real estate brokers, the higher their perceptions of trust in supervisor. The empirical results are in support of Hypothesis 4. The estimated coefficient for transactional leadership is 0.405, attaining a level of significance of 1%. This indicates that the higher the perceptions of transactional leadership by real estate brokers, the higher their perceptions of trust in supervisor. The empirical results are in support of Hypothesis 5. The estimated coefficient for leader emotional intelligence is 0.221, attaining a level of significance of 1%. This indicates that the higher the perceptions of leader emotional intelligence by real estate brokers, the higher their perceptions of trust in supervisor. The empirical results are in support of Hypothesis 6.

In the results of estimation in Model 3, the estimated coefficient for the perceptions of trust in supervisor is 0.170, attaining a level

**Table 2**  
Null model analysis.

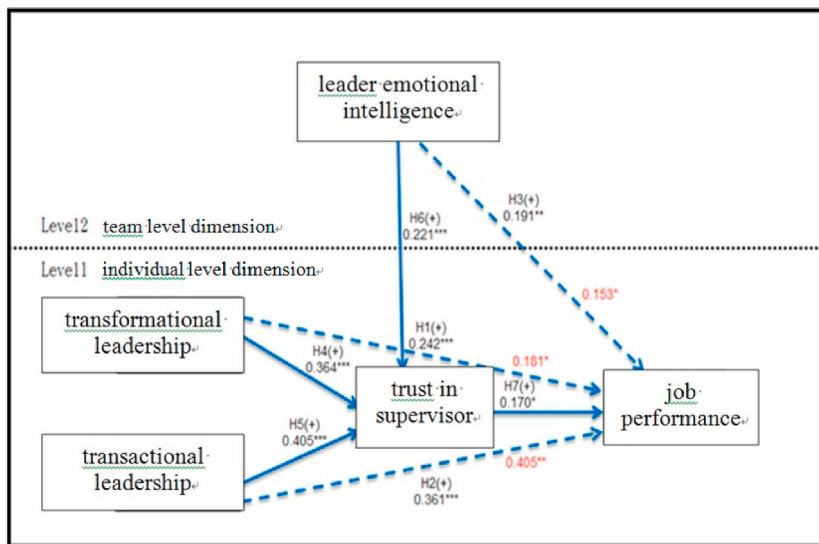
Job performance					
	Standard deviation	Variance	Degree of freedom	Chi-square value	P-value
$u_{0j}, \hat{\tau}_{00}$	0.18719	0.03504	60	92.63576	0.005
$r, \hat{\sigma}^2$	0.61699	0.38068			
Trust in supervisor					
$u_{0j}, \hat{\tau}_{00}$	0.28909	0.08357	60	153.20545	0.001
$r, \hat{\sigma}^2$	0.56771	0.32229			

Notes: Level 1 sample number = 367; Level 2 sample number = 61.

**Table 3**  
Empirical result analysis.

Outcome variable	Model 1: Job performance	Model 2: Trust in supervisor	Model 3: Job performance
<b>Fixed effect</b>			
Intercept	3.302*** (0.398)	3.448*** (0.330)	3.454*** (0.393)
<b>Level1</b>			
Transformational leadership	0.242*** (0.101)	0.364*** (0.093)	0.181* (0.102)
Transactional leadership	0.361*** (0.101)	0.405*** (0.073)	0.405** (0.073)
Trust in supervisor			0.170* (0.091)
Gender	-0.020 (0.042)	0.032 (0.037)	-0.026 (0.042)
Working years	0.013 (0.013)	-0.018** (0.007)	0.016 (0.013)
<b>Level2</b>			
Leader emotional intelligence	0.191** (0.096)	0.221*** (0.080)	0.153* (0.094)
Business model	-0.065 (0.055)	-0.089** (0.036)	-0.050 (0.058)
<b>Random effect</b>			
$u_{0j}, \hat{\tau}_{00}$	0.00025	0.00188	0.00106
$r, \hat{\sigma}^2$	0.251	0.128	0.247
Deviance (-2LL)	558.399	321.662	554.615
Number of estimated parameters	2	2	2

Notes: Level 1 sample number = 367; Level 2 sample number = 61. \*Indicates level of significance at  $p < 0.1$ , \*\*Indicates level of significance at  $p < 0.05$ , \*\*\*Indicates level of significance at  $p < 0.01$ . The data in brackets represents robust standard errors.



**Fig. 2.** Empirical result.

of significance of 10%. This indicates that the higher the perceptions of trust in supervisor by real estate brokers, the higher their job performance. The empirical results are in support of Hypothesis 7. With H1, H4, and H7 already supported, and the estimated coefficient for transformational leadership at 0.181, attaining a level of significance of 10%, this indicates that the higher the perceptions of transformational leadership by real estate brokers, the higher their job performance. The empirical results show that the relationship between transformational leadership and job performance is influenced by the mediation effect of trust in supervisor, where the effect is a partial mediation, thus the empirical results are in support of Hypothesis 8. The estimated coefficient for transactional leadership is 0.405, attaining a level of significance of 5%. This indicates that the higher the perceptions of transactional leadership by real estate brokers, the higher their job performance. With H2, H5, and H7 already supported, the empirical results show that the relationship between transactional leadership and job performance is influenced by the partial mediation effect of trust in supervisor, thus the empirical results are in support of Hypothesis 9. The estimated coefficient for leader emotional intelligence is 0.153, attaining a level of significance of 10%. This indicates that the higher the perceptions of leader emotional intelligence by real estate brokers, the higher their job performance. With H3, H6, and H7 already supported, the empirical results show that the relationship between leader emotional intelligence and job performance is influenced by the partial mediation effect of trust in supervisor, thus the empirical results are in support of Hypothesis 10.

## 7. Discussion

Firstly, this study explored the relationships between leader emotional intelligence, transformational leadership, and transactional leadership and the job performance of employees. Previous studies have pointed out that transformational leadership and job performance share a positive correlation [56], where the closer the relationship between transformational leaders and employees, the higher the job performance of employees. Buil, Martínez, and Matute [53] believed that transformational leaders actively encourage the behavior of employees, enhance their self-interest, improve capabilities for innovation and creativity, and encourage employees to exceed predetermined performance expectations. The empirical results are in support of Hypothesis 1. Transactional leadership, on the other hand, promote the job performance of employees through systems of reward and penalty. Judge and Piccolo [61] and Masa' deh, Obeidat, and Tarhini [38] also pointed out that transactional leadership influences employee job performance. The empirical results are in support of Hypothesis 2. Leader emotional intelligence has a positive impact on job performance [62]. The empirical results are in support of Hypothesis 3. With a lack of previous studies on the cross-level relationship between leader emotional intelligence and employee job performance, this study adopted the use of hierarchical linear modeling (HLM) analysis in showing that the employees' perceptions of leader emotional intelligence have a significant and positive relationship with employee job performance. This shows that leader emotional intelligence has a cross-level relationship with employee job performance.

Secondly, trust in supervisor was included as a mediator variable and it was necessary to verify whether each independent variable has a significant relationship with the mediator variable. The study by Lin and Hsiao [108] showed that transformational leadership does impact the trust of employees in their supervisors. Cai, Loon, and Wong [70] also believed that transformational leadership has a significant and positive impact on trust in supervisor. The empirical results support H4. Jung and Avolio [19] explored the role of trust in supervisor as a mediator in the correlation between transactional leadership and job performance and found that transactional leadership has a significant and positive impact on trust in supervisor. Cai, Loon, and Wong [70] also believed that transactional leadership has a significant and positive impact on trust in supervisor. The empirical results support H5. Schlechter and Strauss [74] also suggested that the emotional intelligence of team leaders has a significant and positive impact on trust in supervisor. The empirical results support H6. The empirical results of this study are in support of hypotheses H4, H5, and H6. In a previous study, Zhu, Newman, Miao, and Hooke [109] used two types of trust (affective and cognitive trust) as mediator variables to examine the influence of transformational leadership on job performance. The authors also used HLM and considered the cross-level effects between an individual and a team. Even though these cross-level effects were considered by Braun, Peus, Weisweiler, and Frey [71], the variables selected were still trust-oriented, i.e., trust in teams and trust in supervisor. Aside from trust in supervisor, we also included the variable of the leader's emotional intelligence, which presents new interpretations and applications for the mediator variable of trust in supervisor.

Thirdly, after the mediator variable is taken into consideration in the model, there is said to be full mediation effects if the estimated coefficient value is insignificant, or partial mediation effects if there is significant difference [110]. The empirical results also show that the relationships between transformational leadership and transactional leadership and job performance will be influenced by the mediating effects of trust in supervisor, where the estimated coefficient for transformational leadership is 0.181, attaining a level of significance of 10%, indicating partial mediation effects, while the estimated coefficient for transactional leadership is 0.405, attaining a level of significance of 5%, also indicating partial mediation effects. Also, the significant relationship between leader emotional intelligence and job performance is influenced by the mediating effects of trust in supervisor. The estimated coefficient for leader emotional intelligence is 0.153, attaining a level of significance of 10%, also indicating partial mediation effects. This study expanded on the study by Schaubroeck et al. [46] on multilevel analysis of correlations concerning trust.

Fourthly, in terms of control variables, the results of this study show that the greater the number of years worked by real estate brokers, the lower their perceptions of trust in supervisor. Most senior employees believe that they can participate in the decision-making processes of the company, allowing them to distinguish their thought processes, work experience, and positions in the company, and are less likely to abide by the leadership of their supervisors [105]. The empirical results show that respondents from direct sales firms have significantly lower levels of trust in supervisor than those from franchise firms. When the interaction between the employees of direct sales firms and their headquarters is poor in quality, the trust of employees in their headquarters is lowered, where reasons include disagreement in beliefs, mismanagement, and distribution of benefits [111]. As franchise firms have signed agreements with the franchise headquarters, this indicates that the firm owners possess a basic level of trust in the franchise headquarters and share common goals with the franchise headquarters [112].

### 7.1. Theoretical implications

This study adopted the use of HLM in setting up leader emotional intelligence as a group-level variable, and transformational leadership, transactional leadership, trust in supervisor, and job performance as individual-level variables, which are then aggregated to study the relationships between leader emotional intelligence, leadership type, and trust and the job performance of real estate brokers. It is then proposed that the relationships between leader emotional intelligence, transformational leadership, and transactional leadership on job performance are influenced by the mediating effects of trust in supervisor, where gender, number of working years and organization-level business type are set up as control variables. This study differed from previous studies in terms of first exploring the relationships between leader emotional intelligence, transformational leadership, transactional leadership, and trust in supervisor and job performance; secondly, the variable of trust in supervisor was included on the individual level to explore the relationships between leader emotional intelligence, transformational leadership, and transactional leadership and trust in supervisor; finally, this study discussed whether the significant relationships between leader emotional intelligence, transformational leadership,



and transactional leadership and job performance is influenced by the mediating effects of trust in supervisor. After verification through the null model in HLM, results show that there is significant difference between the mean values of job performance and trust in supervisor between branch offices, indicating that the use of HLM for analysis is appropriate.

Examining the influence of transformational leadership on individual performance, Walumbwa, Avolio, and Zhu [113] considered the variables of identification with work unit and self-efficacy. By employing a trust-oriented perspective, this study examined the influence of leadership style on job performance from a different perspective while accounting for the hierarchical effects between a team and an individual. Although Zhu, Newman, Miao, and Hooke [109] similarly used trust in supervisor as a mediator variable when studying the influence of transformational leadership on job performance, the authors did not examine the cross-level effects between an individual and a team. Using trust in teams and trust in supervisor as their mediator variables, Braun, Peus, Weisweiler, and Frey [71] studied the influences of transactional leadership and transformational leadership on job performance. Following Braun et al.'s [71] study, we concurrently considered the influences of transactional leadership and transformational leadership on job performance while including the variable of a leader's emotional intelligence and its cross-level effects on the influences of trust in supervisor and job performance. This is a new contribution in the establishment of the theoretical framework as well as the empirical results.

## 7.2. Practical implications

Firstly, the leadership style of leaders has a direct relationship with the job performance of employees. Dvir, Eden, Avolio, and Shamir [51] believed establishing closer relationships between transformational leaders and employees can improve the job performance of employees. Through establishing common ideals and visions, leaders cultivate employees to identify with and develop a sense of mission for their company and leaders, thereby enhancing their enthusiasm for work. Rank, Nelson, Allen, and Xu [32] believed that when the employees' performance at work tended to be low, the transformational leadership style can influence changes in the employees' attitudes and ideas, thereby enhancing their motivations to work and improving their job performance. Transformational leaders should offer employees care and encouragement in a timely manner, enhance their enthusiasm and confidence at work, and lead by example, establishing good examples and leading employees to realize the company's goals and visions. Chaudhry and Jave [37] believed that the transactional leadership style can effectively improve the employees' motivations to work. Rewards and penalties for the employees depend on their job performance, where accomplishing work objectives earns them rewards, and failing to accomplish them calls for penalties [58]. Transactional leaders should supervise the work performance of employees in a timely manner and establish clear work objectives and regulations for reward and penalty to encourage employees to achieve their work objectives.

Furthermore, the empirical results of this study show the importance of leader emotional intelligence in regard to the job performance of employees. Emotional intelligence plays an important role for leaders in terms of work operations, employee management, or interpersonal and social interactions. People with high emotional intelligence tend to perform well in interpersonal relationships or social interactions [114]. In the face of problems at work or conflicts with employees, leaders with high emotional intelligence can control their emotions, adjust their mentality, and effectively propose solutions in time. Clarke [115] believed that emotional intelligence can be enhanced by training, especially in the workplace, where emotional intelligence may be enhanced through repetitive learning. While managing employees, if the leader can condition their emotional intelligence, the relationship between leader and employee can be improved along with the leader's emotional intelligence, in turn influencing the employee's work performance.

In addition, the empirical results of this study also show that as the employees' perceptions of leader emotional intelligence, transformational leadership, and transactional leadership increase, the employees' trust in their supervisors also increases, where their job performance is in turn influenced by trust in supervisor. Leaders with high emotional intelligence enable employees to develop a sense of trust in their supervisors through effective emotional management and application; transformational leaders, through establishing common ideals and goals and maintaining good interactions with employees, also cultivate the employees to develop greater trust in their supervisors; transactional leaders cultivate the employees' trust in supervisors through timely rewards and penalties and the maintenance of long-term cooperative relationships. The strength of trust influences the interactions between employees and supervisors, where relationships with higher levels of trust can enhance the cohesion among another and aid in both emotional and informational interactions [116]. Lewicki and Bunker [117] believed that the establishment and maintenance of relationships of trust require interactions over a long period of time. The trust of employees in their supervisors depends on whether employees can openly communicate with their supervisors on the problems they encounter at work [118]. The professional competence and work attitudes of supervisors also influence the employees' trust in them [119]. In the face of various problems, supervisors must not only maintain an attitude of fairness, but also refrain from concealing or evading problems. If they can make the appropriate decisions through adequate assessment and their professional capabilities, the employees' sense of trust in their supervisors will be heightened, and the enhance the work performance of employees can then be enhanced based on this relationship of trust.

In practice, the greatest difference between the brokerage industry and other service industries is that broker's wages are primarily commission-based. The determinants of a successful transaction not only include continuous self-improvement and learning, but also marketing and inter-personal communication skills, as well as the approaches taken in different scenarios. This tacit knowledge can only be acquired through observation of the behaviors and attitudes of a leader, and not from books. Therefore, leaders' emotional intelligence and leadership style affect brokers' job performance to a certain extent. Given this influence, increasing employees' level of trust in their supervisor is key to the sustainability of an organization. In other words, employees who trust their leader are less likely to leave their job and are more likely to exhibit better job performance. We hope that our empirical results can help organizations highlight the importance of building trust between leaders and employees. Leaders should also adopt different leadership styles and



emotional intelligence management approaches based on the personal attributes of their employees. Stability within an organization is key to maintaining robust business operations and job performance.

## 8. Conclusion and recommendations

### 8.1. Conclusion

This study confirms that the leadership styles of transformational leadership and transactional leadership, and the emotional intelligence leaders have a significant and positive relationship with the trust in supervisor and job performance of employees, while trust in supervisor also has a significant and positive relationship with the job performance of employees. In addition, this study proposed that the relationships between the three variables of leader emotional intelligence, transformational leadership, and transactional leadership on job performance is influenced by the mediation effects of trust in supervisor. After verification through analysis by hierarchical linear modeling (HLM), it is shown that the relationship between each variable and job performance is indeed influenced by the mediation effects of trust in supervisor. At present, hierarchical linear studies and empirical studies on leadership styles are generally lacking [16]. This study explored the relationships between leadership styles and job performance at the individual level. In most previous studies, the structural equation model is used to explore factors affecting job performance (such as [14,68]). This study differed from previous studies in adopting HLM analysis in exploring the relationship between each variable and job performance.

### 8.2. Recommendations for future studies

Firstly, this study explored the relationships between emotional intelligence and the leadership styles of leaders and job performance. In the future, leaders may be divided into male and female leaders when exploring the differences in the relationships involving emotional intelligence, as well as the differences in the relationships between different leadership styles (transactional leadership and transformational leadership) and job performance. Other non-franchise real estate brokerage brands may also be included to explore whether differences exist in the research findings for well-known brands and non-franchise real estate brokerage brands. Secondly, this study explored the relationships between emotional intelligence, leadership styles, and trust in supervisor of real estate brokers and their job performance. In the future, the service climate or leader psychological capital may be included as group-level variables, allowing the HLM structure and analysis used in this study to be more complete.

In business organizations, achieving high levels of performance and maintaining sustainability have always been common goals for enterprises; the same is true for the brokerage industry. However, a significant difference between the brokerage industry and other industrial sectors is that houses are high-priced products that general consumers seldom purchase. Positive selling and buying experiences for consumers rely on efficient intra-organizational operations. Thus, leaders' behaviors and management skills are fundamental to organizational operations. Due to funding and workforce limitations, the scope of this study was the brokerage industry in Kaohsiung City. We recommend that the study be expanded in the future to enable comparative analyses between regions. Moreover, different industries such as the hospitality (hotel and food and beverage) industry can be included to enhance the extensibility of our findings.

## Author contributions

Conceived and designed the experiments: Chun-Chang Lee, Wen-Chih Yeh; Performed the experiments: Wen-Chih Yeh; Analyzed and interpreted the data: Xiao-Chi Lin; Contributed reagents, materials, analysis tools or data: Zheng Yu; Wrote the paper: Xiao-Chi Lin, Xiao-Chi Lin.

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## Institutional review board statement

Not applicable for studies not involving humans or animals.

## Informed consent statement

Informed consent was obtained from all participants involved in the study.

## Data availability statement

The data presented in this study are available upon request from the corresponding author.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

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## Appendix

### Appendix 1 Descriptive statistics of the sample

Continuous variable	Mean	Minimum	Maximum
Age	39%	20	69
Categorical variable	Category	Frequency	Effective Percentage
Sex	Male	194	52.9%
	Female	173	47.1%
Marital status	Married	184	50.4%
	Single	166	45.5%
	Other	15	4.1%
Education	University (including two/four-year technical college)	186	50.7%
	Senior (vocational) high school or below	95	25.9%
	Junior college	71	19.3%
	Postgraduate	15	4.1%
Tenure	Less than 1 year	69	18.8%
	1–3 years	120	32.7%
	4–6 years	68	18.5%
	7–9 years	45	12.3%
	10–12 years	19	5.2%
	13–15 years	14	3.8%
	16–18 years	9	2.5%
	More than 19 years	23	6.6%
Position	Agent	302	82.3%
	Store manager	24	6.5%
	Administrator	36	9.8%
	Other	5	1.4%
Business type	Franchisee	295	80.4%
	Direct-sales	72	19.6%
Mean annual income	Less than NT\$300,000	99	28.1%
	NT\$310,000-NT\$500,000	98	27.8%
	NT\$510,000-NT\$700,000	76	21.6%
	NT\$710,000-NT\$900,000	35	9.9%
	NT\$910,000-NT\$1,100,000	18	5.1%

### Appendix 2

#### Analysis of scale reliability, factor loading, and variance extracted

Variable	Factor loading (unstandardized)	Factor loading (standardized)	Error variance	Reliability of test variable	Composite reliability (CR)	Variance extracted (AVE)	R <sup>2</sup> of structural equation
<b>Leader emotional intelligence</b>					0.929	0.868	–
Emotional recognition for others	1.000	0.857	0.153	0.734			
Emotional use	0.974**	0.909**	0.084	0.827			
Emotional self-management	0.949	0.814	0.193	0.663			
<b>Transformational leadership</b>					0.979	0.894	–
Idealized influence	0.986**	0.911**	0.089	0.831			
Inspirational motivation	1.018**	0.956**	0.044	0.914			
Intellectual stimulation	1.046	0.927	0.081	0.859			
Individualized consideration	1.000	0.923	0.078	0.852			

(continued on next page)

## Appendix 2 (continued)

Variable	Factor loading (unstandardized)	Factor loading (standardized)	Error variance	Reliability of test variable	Composite reliability (CR)	Variance extracted (AVE)	R <sup>2</sup> of structural equation
<b>Transactional leadership</b>					0.943	0.902	–
Material and personal rewards	1.061**	0.928**	0.060	0.860			
Managing by exception	1.000	0.862	0.115	0.742			
<b>Trust in supervisor</b>					0.980	0.908	0.733
Trust 1	1.000**	0.867**	0.127	0.752			
Trust 2	0.967**	0.922**	0.064	0.850			
Trust 3	1.005**	0.901**	0.091	0.811			
Trust 4	1.016	0.912	0.081	0.832			
Trust 5	1.009	0.938	0.053	0.881			
<b>Job performance</b>					0.950	0.905	0.478
Contextual performance	0.985**	0.956**	0.138	0.914			
Task performance	1.000	0.855	0.034	0.732			

Note: \* indicates  $p < 0.05$ , \*\* indicates  $p < 0.01$ .

## Appendix 3

Correlation matrix of the latent variables

	Emotional intelligence	Transformational leadership	Transactional leadership	Trust in supervisor	Job performance
Emotional intelligence	0.932				
Transformational leadership	0.812	0.946			
Transactional leadership	0.744	0.871	0.950		
Trust in supervisor	0.735	0.805	0.834	0.953	
Job performance	0.583	0.654	0.670	0.624	0.951

Note: Diagonals denote the square root of the Ave of a dimension.

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