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Organizational Commitment as a Mediator of Organizational Support and Emotional Intelligence in Shaping Organizational Citizenship Behavior

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Abstract

Research aims: This study aims to analyze the effect of organizational support and emotional intelligence on organizational citizenship behavior (OCB) through employee organizational commitment.

Design/Methodology/Approach: This research was conducted in the Central Bureau of Statistics in Medan City with a population of 100 permanent partner employees. Using non-probability sampling, the entire population became the research sample. Meanwhile, the analysis technique employed path analysis.

Research findings: The results proved that organizational support and emotional intelligence had a significant effect directly on organizational citizenship behavior (OCB) and indirectly through employees' organizational commitment. In other words, increased organizational support and emotional intelligence of employees will intensify the level of employee organizational commitment, raising the level of organizational citizenship behavior (OCB) and vice versa. In this case, organizational support strongly predicts employees' high organizational commitment.

Theoretical contribution/Originality: Further research that explores other predictors needs to be carried out with more significant respondents to generalize the findings better.

Practitioner/Policy implication: It is essential to provide more intensive organizational support to employees since this variable is a strong organizational predictor of generating a superior level of employee organizational commitment. Organizations also need to conduct in-depth personality tests to detect the level of individual emotional intelligence of employees who work in the field and interact with the community for better work effectiveness.

Research limitation/Implication: The limited number of population and samples in the agency is a limitation of the study to generalize the findings better.

Keywords: Organizational commitment; Organizational support; Emotional intelligence; Organizational citizenship behavior

Introduction

Various aspects can determine the company's success, mainly from its employees' work behavior. As such, employees are required to complete the tasks and responsibilities that become their job descriptions. However, in addition to that, employees are often willing to voluntarily expend tremendous effort for the organization by doing various tasks outside the

demands of their job description, called organizational citizenship behavior (OCB) (Organ, 1990). OCB behavior manifests itself in multiple forms of behavior, including helping coworkers, efforts to redesign work processes to make them more efficient, deviations from standard operating procedures (Organ & Konovsky, 1989; Organ, 1997), and serving customers better (Borucki & Burke, 1999; Chuang & Liao, 2010; Junita et al., 2019).

Employee organizational citizenship behavior does not casually appear. Based on the previous research results, organizational support is one of the organizational predictors that need to be conditioned by the companies to grow with high employee organizational commitment (Sari et al., 2021; Metria & Riana, 2018; Wijaya & Yuniawan, 2017; Aisyah & Wartini, 2016). According to Alkerdawy (2014), Rhoades and Eisenberger (2002), and Robbins and Judge (2018), organizational support is a form of organizational concern for the mental well-being of employees, which makes employees feel obliged to return the favor to their organization. Organizational support can also be in the form of training, tools, expectations, productive work teams (Mathis & Jackson, 2011), character leadership style (Sari et al., 2021), promotions (Rhoades & Eisenberger, 2002), job autonomy (Allen et al., 2003), and career development (Lew, 2009) provided to employees.

Apart from organizational predictors, this study also focuses on individual predictors that can lead to high employee organizational commitment and OCB, including emotional intelligence. Emotional intelligence is a set of abilities to understand and express emotions, assimilate emotions in mind, understand and reason emotions, and regulate emotions in oneself and others (McShane & Von Glinow, 2010). Based on theoretical studies and previous research results, individual emotional intelligence significantly influences organizational commitment (Khan et al., 2014) and OCB behavior (Suwandewi & Dewi, 2016; Pigome et al., 2019; Goller & Dewi, 2020).

Another individual predictor that contributes significantly to the emergence of employee OCB is organizational commitment. The previous research results have proven that organizational commitment is a strong predictor of the emergence of OCB in employees (Aisyah & Wartini, 2016; Wijaya & Yuniawan, 2017; Pigome et al., 2019; Junita, 2017; Junita et al., 2019; Busharmaidi, 2020). In this case, commitment is an affective aspect that influences an individual's work behavior (McShane & Von Glinow, 2010). When employees identify themselves with the organization, they will feel bound as members of the organization. Aisyah and Wartini (2016) and Junita et al. (2019) even confirmed that organizational commitment is a critical mediating variable that connects various organizational predictors to raise an employee's OCB.

Moreover, organizational support provided by the Central Bureau of Statistics (BPS) in Medan City can be perceived differently by each employee, impacting organizational commitment and OCB. Similarly, employees' emotional intelligence is considered relevant to be analyzed in their work activities outside the office and far from the direct supervision of their superiors. The respondents also interacted with the public to collect various field survey data needed by organizations which, in the interaction process, were required to have qualified emotional intelligence to support their work to run well. Therefore, this

research emphasizes organizational antecedents in the form of organizational support, which varies in character, and individual antecedents in emotional intelligence, which is rarely observed empirically in previous research. For this reason, analyzing the impact of organizational (organizational support) and individual (emotional intelligence) predictors in an integrative manner on the emergence of employee OCB through organizational commitment as a mediator becomes this study's significance and research objective. It also completes the theoretical and empirical gap from previous research, which only partially analyzed organizational or individual predictors in generating OCB and organizational commitment.

Literature Review and Hypotheses Development

Organizational Citizenship Behavior

Organizational citizenship behavior (henceforth called OCB) is individual behavior that is independent (discretionary), does not directly receive rewards from the formal reward system, and encourages the effectiveness of organizational functions (Organ, 1990; Greenberg & Baron, 2003). Organ (1988) argues that the OCB concept differs from organizational commitment, where OCB is tangible as work behavior, while commitment is an attitude character (Mowday et al., 1979). Van Dyne et al. (1995) specifically mentioned OCB as a form of extra-role behavior, i.e., behavior that benefits the organization beyond the obligations of the individual role. Borman and Motowidlo (1997) refer to it as the contextual performance term.

Empirically, various antecedent variables trigger the emergence of employee OCB, including personal interests, social motives (Michel, 2016), servant leadership, employee empowerment, leader-member exchange interactions (Sari et al., 2021), role clarity, organizational commitment, organizational fairness, individual traits (Hakim et al., 2014), job satisfaction, organizational support, personality (Hakim et al., 2014; Khan et al., 2021), loyalty, self-efficacy (Arifin et al., 2021), transformational leadership, management systems (Khan et al., 2021), individual characteristics of workers, task characteristics, organizational conditions, and leadership behavior (Osman et al., 2019). In general, it is concluded that individual and organizational factors can drive the emergence of OCB.

Moreover, OCB in employees manifests itself in several dimensions (Organ, 1988; Organ et al., 2006):
1. Altruism is the behavior of employees willing to help colleagues experiencing task or personal problems.
2. Conscientiousness is the behavior of doing things that exceed the company's expectations and not only completing the task.
3. Sportsmanship is a tolerant work behavior of less-than-ideal conditions in the organization, so it tends to create a pleasant work environment.
4. Courtesy is the behavior of maintaining and fostering good relations with colleagues.
5. Civic virtue is a work behavior full of initiative and responsible for improving the quality of the field of work occupied.

Organizational Commitment

Griffin (2004) and Mowday et al. (1979) define organizational commitment as an individual's relative strength to identify with the organization and be deeply involved, including trust, support for the goals and values of the organization, an ardent desire to work hard for, and a strong will to maintain membership in the organization.

In addition, organizational commitment is one of the attitude variables that significantly affect various positive employee behaviors, including OCB. As an attitude variable, it allows employees to have a variety of positive and negative assessments reflected in their level of organizational commitment. Variations in the level of employee commitment are also determined by numerous factors, both organizational and individual factors (Junita, 2017; Bodjrenou et al., 2019; Bodjrenou et al., 2019; Parimita et al., 2020). The previous research findings support this, stating that organizational commitment could significantly contribute to employee OCB (Ardi & Sudarma, 2015; Fazio, 2015; Devece et al., 2016; Pigome et al., 2019; Siregar et al., 2019; Wilkanandya & Sudarma., 2020) but also not significant (Novianti, 2021).

According to Meyer and Allen (1991) dan Mowday et al. (1982), components of organizational commitment include:
1. Affective commitment relates to employees' emotional identification and involvement in an organization.
2. Continuance commitment is based on employees' perceptions of the losses they will face if they leave the organization.
3. Normative commitment is based on a sense of employee compliance with the organization to repay all the benefits received from the organization.

Each individual can have all three components within him at once. However, the diversity of individual characters in organizations can provide diverse levels of organizational commitment. The way individuals perceive organizational situations also contributes greatly to employee organizational commitment.

The previous research results have verified a substantial contribution of organizational commitment in making employees' OCB more dominant. Thus, this phenomenon justifies this research to place organizational commitment as a mediating variable between organizational antecedents, namely organizational support and individual antecedents, i.e., emotional intelligence, on employee OCB. It aligns with Junita's (2017) results, who concluded that organizational commitment is one of the employee attitude variables appropriately positioned as a mediating variable.

Organizational Support

Organizational support is the perception and belief of employees that the organization where they work cares, appreciates the contribution of workers to the organization, and always conditions various forms of support and assistance for its employees (Blau, 1964; Eisenberger et al., 1986; Eisenberger & Stinglhamber, 2011; Erdogan & Enders, 2007).

Employees' perceptions of organizational support also largely determine whether the organization can meet employee expectations regarding things that should be received from the organization.

In essence, organizational support includes three principles: reciprocity (a mutually beneficial exchange between the interests of the organization and employees), meeting the social needs of employees at work, and a fair reward system (Rhoades & Eisenberger, 2002). Some dimensions of organizational support, according to Eisenberger et al. (1986), Rhoades & Eisenberger (2002), and Robbins and Judge (2018), are procedural justice that arises from the process used to determine the distribution of rewards, working conditions, and rewards as the treatment of organizations that consider workers as substantial investments (assets) for the organization; thus, attention is paid to the implementation of various practices that can increase the value of human assets. It comprises training, promotions (Rhoades & Eisenberger, 2002), job autonomy (Allen et al., 2003), career development (Lew, 2009), distributive justice (McShane & Von Glinow, 2010; Putranto et al., 2019; Fachriansyah et al.., 2021), supervisory support (Susskind et al., 2007; Mustika et al., 2020; Fachriansyah et al., 2021), work structure, personal development (Ginduz, 2014), rewards, working conditions (Mustika et al., 2020; Fachriansyah et al., 2021), and welfare (Ansori & Wulansari, 2021).

Organizational support is also critical in determining employees' character traits and attitudes. In this respect, employee perceptions of organizational support have significant implications for performance (Fachriansyah et al., 2021), organizational commitment (Gunduz, 2014; Ardi & Sudarma, 2015; Fazio, 2015; Putranto et al., 2019), employee engagement, OCB (Frenkel & Bednall, 2016; Saputra & Supartha; 2019; Ansori & Wulansari, 2021), psychological well-being (Putranto et al., 2019), job satisfaction, and knowledge sharing activities (Mustika et al., 2020).

Emotional Intelligence

McShane and Glinow (2010), Ivancevich (2011), and Daud (2012) define emotional intelligence as a set of abilities to understand and express emotions, assimilate emotions in mind, understand and reason emotions, and regulate emotions in oneself and others. Besides, Goleman (1998) defines emotional intelligence as a person's understanding of the feelings of others, especially in the individual decision-making process. Salkojani et al. (2012) also elaborated on emotional intelligence as a non-cognitive competence that makes individuals strong in facing various internal and external pressures. Meanwhile, the FLICC (2011) model operationally defines emotional intelligence as competence to perform conflict management, external awareness, flexibility, negotiation, interpersonal skills, self-management, teamwork, and collaboration.

In addition, empirically, emotional intelligence contributes significantly to improving academic achievement (Thaib, 2013; Farhan & Alvin, 2019), task performance (Nurzaman & Amalia, 2022), teamwork (Fannon, 2018; Al-Faweer & Al-Khatib, 2020), reducing conflict (Goleman et al., 2002), organizational commitment (Fazio, 2015; Khan et al., 2014), and OCB (Sahafi et al., 2011; Ibrahim, 2013; Naghdi & Shatalebi, 2013).

Various indicators of emotional intelligence measurement have been put forward by experts. Khan et al. (2014) suggest four dimensions of emotional intelligence that contributed to the emergence of organizational commitment in employees: self-assessment, self-awareness, social awareness, and relationship management. Other dimensions encompass teamwork and collaboration (Goleman, 1998), optimism (Goleman, 1998), service orientation, self-regulation, motivation, empathy, social skills (Goleman, 1995; Zhang et al., 2017), interpersonal skills, stress management, adaptive ability, and mood (Nurzaman & Amalia, 2022).

Research Framework

Based on theoretical and empirical studies relevant to the conceptual research framework (Figure 1), the research hypotheses were formulated as follows:

H_1: *Organizational support and emotional intelligence significantly affect employee organizational commitment.*

H_2 : *Organizational support and emotional intelligence significantly affect organizational citizenship behavior mediated by employee organizational commitment.*
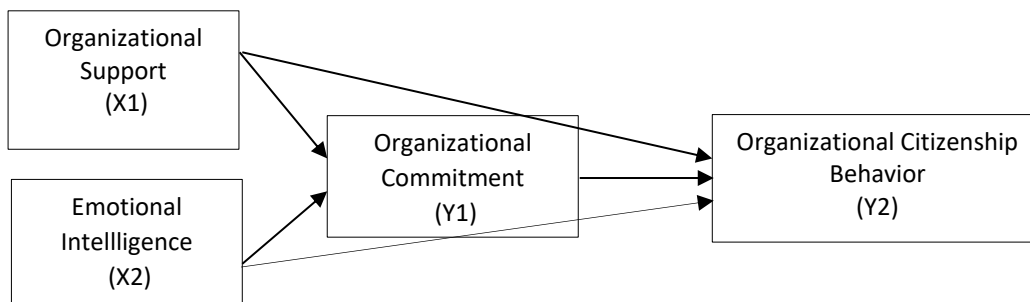

Figure 1 Conceptual Framework

Research Methods

This causality research used quantitative/statistical analysis to assess research hypotheses (Sugiyono, 2013). Testing and analyzing the direct influence of organizational support and emotional intelligence in generating employee organizational citizenship behavior, as well as indirectly through organizational commitment, was conducted with the help of inferential and descriptive statistics. In addition, the path analysis technique employed inferential statistics to analyze the relationship between research variables. Besides, descriptive statistics were also utilized to help deepen the discussion of the inferential statistical test results (path analysis). All were based on a quantitative approach.

The research variables included:
1. Organizational support is employees' general belief in the organization's care and contribution to their welfare (Rhoades & Eisenberger, 2002). Organizational support in this study was measured by four dimensions proposed by Eisenberger et al. (1986): rewards, superior support, working conditions, and employee welfare.
2. Emotional intelligence is recognizing and controlling feelings to help emotional and intellectual development (Salovey & Mayer, 1990). The emotional intelligence variable in this research was assessed by five dimensions of Goleman (1998): self-awareness, self-regulation, self-motivation, empathy, and social skills.
3. Organizational commitment is an attitude that reflects the individual attachment to the organization (Griffin, 2004). It was evaluated by five dimensions of Griffin (2004), including feeling happy to spend the rest of their career in the organization, feeling worried if stopping working in the company, feeling unethical to move to another organization, loyalty, and lack of intention to leave the organization despite getting a better offer in another organization.
4. Organizational citizenship behavior (OCB) is the voluntary behavior of a worker to want to do a task or job outside his responsibilities or obligations for the advancement or benefit of his organization (Organ et al., 2006). The OCB variable in this study was measured by five dimensions used by Organ et al. (2006), including altruism, sportsmanship, courtesy, civic virtue, and conscientiousness behavior.

Further, the population and samples in this study were all employees (permanent partners) who worked at the Central Bureau of Statistics in Medan City, totaling 100 people. The sampling technique was then referred to as non-probability or saturated sampling (Sugiyono, 2013). The path analysis technique was used to examine the direct effect of exogenous variables on endogenous variables (Sarwono, 2012). Path analysis is usually used by first fulfilling various required tests, including instrument validity and reliability, normality, multicollinearity, and heteroscedasticity (Ghozali 2017).

Results and Discussion

Respondents' Characteristics

Research respondents can be described based on education level, length of work, age, and gender (Figure 2). Most respondents attained a bachelor's level of education (86%), had worked at BPS Medan City for 3-6 years (90%), were aged > 31 years (74%), and were female (56%).

Validity and Reliability Instruments Test Results

Based on the validity test results of eight question items for the organizational support variable, ten question items for the emotional intelligence variable, and eight question items for the organizational commitment variable, the overall results of the items in each variable were declared valid since they had an r-value > r-table (0.196) at n = 100, df = n2,

and a significance level of 5%. As for the OCB variable, a second item was found invalid of the ten question items tested for validity, so it had to be removed and retested for validity.
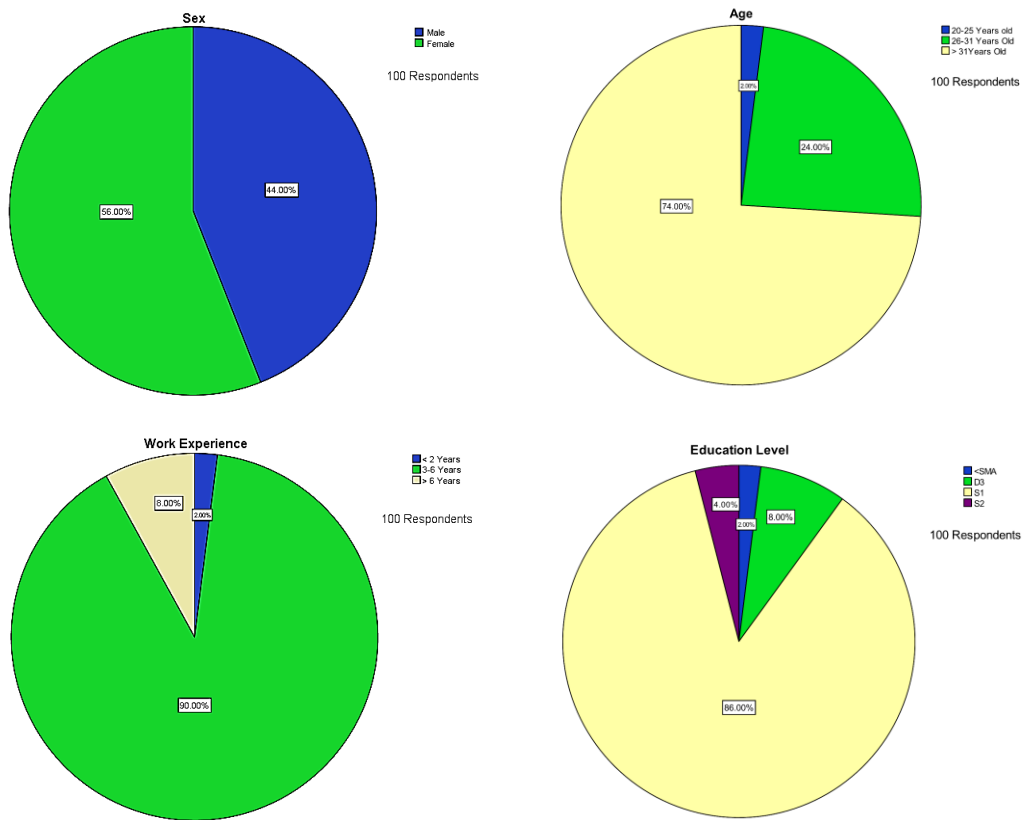

Figure 2. Respondent Characteristics

The value of Cronbach's Alpha of the organizational support variable (X1) was 0.769, emotional intelligence variable (X2) was 0.758, organizational commitment variable (Y1) was 0.793, and organizational citizenship behavior (OCB) variable (Y2) was 0.700. All variables were declared reliable, with Cronbach's Alpha values greater than 0.600 (Ghozali, 2017).

Test Results of Substructure 1 Path Analysis Model (Hypothesis 1)

The model test in this study using path analysis included the analysis of two substructures representing the problem areas and research hypotheses. Substructure 1 examined the effect of organizational support and emotional intelligence on employees' organizational commitment. Based on the normality test results conducted with the Kolmogorov-Smirnov Test (KS Test), the KS Test value was obtained at 0.078 > 0.050 (a), so it was concluded that the data in the research model for hypothesis 1 were normally distributed (Ghozali, 2017). Based on the multicollinearity test results, there was no significant correlation between the study's independent variables. The VIF value of the organizational support and emotional intelligence variables was 1.625 < 10, and the

tolerance value was 0.615 > 0.100. Thus, there was no heteroscedasticity problem in the first hypothesis model since the data were randomly distributed.

According to Ferdinand (2014), the F-test is used to assess the model feasibility in explaining the relationship between variables in the observed phenomenon or the research model's suitability with the analyzed phenomenon. Based on the F-test results of hypothesis 1, the calculated F-value was 0.000 < 0.050, and the coefficient of multiple determination (R2) value was 71.5%. It means that organizational support (X1) and emotional intelligence (X2) were feasible to explain the organizational commitment (Y1) of 71.5%, while the remaining 28.5% were influenced by various other variables not observed in this study.

Table 1 The result of the validity and reliability test of research variables

Variable	Question Item	r-value	r-table	Description	Cronbach's Alpha	Description
Organizational Support (X₁)	1	0.677		Valid	0.769	Reliable
	2	0.583		Valid		
	3	0.603		Valid		
	4	0.646	0.196	Valid		
	5	0.607		Valid		
	6	0.588		Valid		
	7	0.546		Valid		
	8	0.699		Valid		
Emotional Intelligence (X₂)	1	0.515	0.196	Valid	0.758	Reliable
	2	0.595		Valid		
	3	0.598		Valid		
	4	0.557		Valid		
	5	0.644		Valid		
	6	0.512		Valid		
	7	0.535		Valid		
	8	0.525		Valid		
	9	0.621		Valid		
	10	0.599		Valid		
Organizational Commitment (Y₁)	1	0.665	0.196	Valid	0.793	Reliable
	2	0.630		Valid		
	3	0.584		Valid		
	4	0.668		Valid		
	5	0.628		Valid		
	6	0.581		Valid		
	7	0.730		Valid		
	8	0.634		Valid		
Organizational Citizenship Behavior (OCB) (Y₂)	1	0.572		Valid	0.700	Reliable
	3	0.418		Valid		
	4	0.637		Valid		
	5	0.673		Valid		
	6	0.528		Valid		
	7	0.471		Valid		
	8	0.395		Valid		
	9	0.367		Valid		
	10	0.517		Valid		

The next is to find out the contribution of organizational support (X1) and organizational intelligence (X2) variables to organizational commitment (Y1) partially (Table 2). Based on the t-test results, the significance value of the organizational support variable (X1) was 0.000 < 0.050 (a), and the emotional intelligence variable (X2) was 0.013 < 0.050 (a). It means that the increased organizational support and individual emotional intelligence of employees will increase the level of organizational commitment of employees and vice versa. In addition, organizational support significantly affected organizational commitment, with a path coefficient value (p1) of 0.731, and emotional intelligence, with a path coefficient value (p2) of 0.172. Meanwhile, e1 shows the variance of the research model, calculated by the formula: e1:√1- R2. Then, the t-test results became the basis for describing the path analysis model of substructure 1, as shown in Figure 3.

Table 2 The results of t-test hypothesis 1

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.554	1.809		3.623	0.000
	X1	0.679	0.064	0.731	10.689	0.000
	X2	0.123	0.049	0.172	2.520	0.013
a. Dependent Variable: Y1						

Test Results of Substructure 2 Path Analysis Model (Hypothesis 2)

Substructure 2 path analysis model tested hypothesis 2: the effect of organizational support and emotional intelligence on organizational citizenship behavior (OCB) through organizational commitment. To evaluate the impact of the research variables, it is necessary to test the data normality, multicollinearity, and heteroscedasticity. Based on the normality test results conducted with the Kolmogorov-Smirnov Test (KS Test), the KS Test value was 0.062 > 0.050 (a), so it was concluded that the data in the research model of hypothesis 1 were normally distributed (Ghozali, 2017).
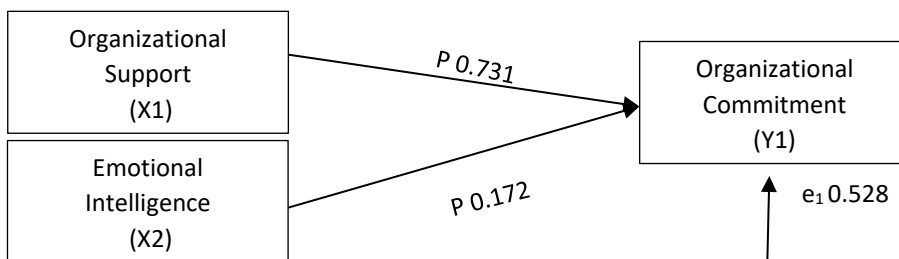

Figure 3 Model of Path Analysis Substructure 1

Based on the multicollinearity test results, the study's independent variables showed no significant correlation between the VIF value of the organizational support of 3.539, emotional intelligence of 1.731, and organizational commitment of 3.580. Besides, the

overall value of the independent variable VIF in the second hypothesis model was < 10. The tolerance value of the organizational support was 0.283, emotional intelligence was 0.578, and organizational commitment was 0.279. Meanwhile, the overall value of the tolerance of the independent variables in the second hypothesis model was > 0.100. Therefore, the heteroscedasticity test results concluded that there was no heteroscedasticity problem in the first hypothesis model since the data were randomly distributed.
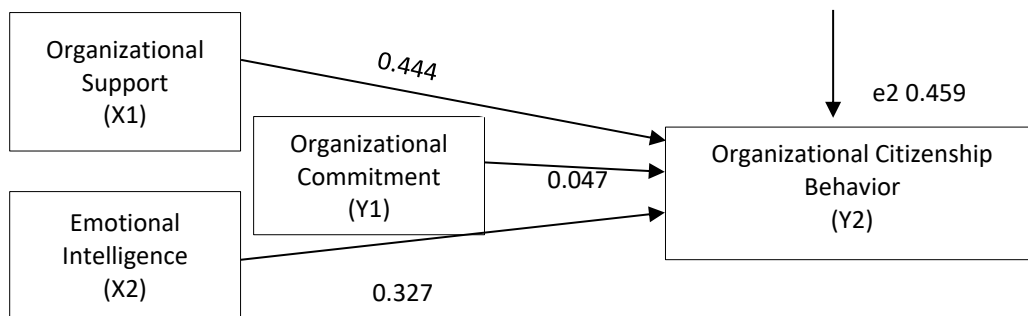

Figure 4 Model of Path Analysis Substructure 2

Based on the F-test results of hypothesis 2, the calculated F-value was 0.000 < 0.050, and the coefficient of multiple determination (R2) was 52.7%. It indicates that organizational support (X1), emotional intelligence (X2), and organizational commitment (Y1) were feasible to explain organizational citizenship behavior (OCB) (Y2) by 52.7%, while the remaining 47.3% were influenced by various other variables not observed in this study.

Table 3 Hypothesis 2 t-test results

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	17.326	2.447		7.080	0.000
	X1	0.407	0.119	0.444	3.416	0.001
	X2	0.229	0.064	0.327	3.590	0.012
	Y1	0.047	0.129	0.047	0.363	0.023
a. Dependent Variable: Y2						

To find out the contribution of organizational support (X1) and organizational intelligence (X2) variables to organizational citizenship behavior (OCB) (Y2) through organizational commitment (Y1) partially, it can be seen from the t-test results as shown in Table 3. Based on the t-test results in Table 3, the significance value of the organizational support variable (X1) was 0.001 < 0.050 (a), emotional intelligence variable (X2) was 0.012 < 0.050 (a), and the organizational commitment variable (Y1) was 0.023 < 0.050 (a). Based on the t-test results of the second hypothesis model, the path coefficient value of the influence of organizational support on organizational citizenship behavior (OCB) was 0.444 (p4). Then, the path coefficient value of the emotional intelligence effect on organizational citizenship behavior was 0.327 (p5), while the path coefficient value of the organizational commitment variable effect on organizational citizenship behavior was 0.047 (p6). These

results indicate that organizational support and emotional intelligence variables significantly affected organizational citizenship behavior (OCB) through organizational commitment. Diagrammatically, the path coefficient values in substructure 2 are depicted in Figure 4.
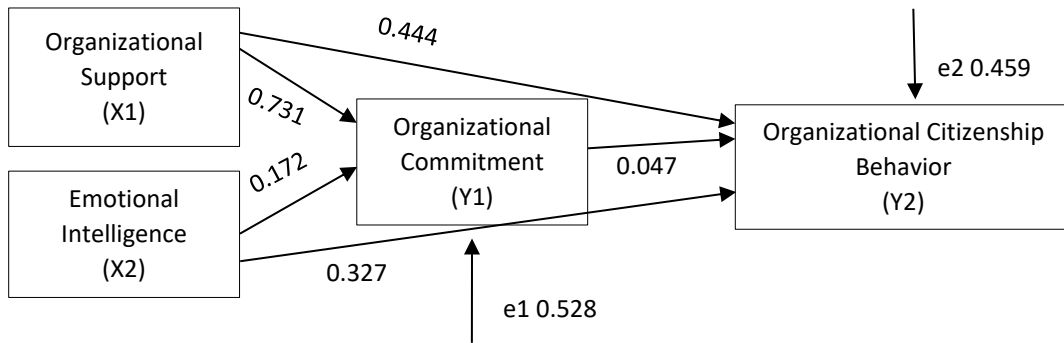

Figure 5 Path Analysis Model of Sub Structure 1 and 2

The path analysis test results of substructure 1 (Figure 3) and sub-structure 2 (Figure 4) then became the basis for describing the overall path analysis model, including paths of substructures 1 and 2, as shown in Figure 5. It appears that the organizational support variable (X1) and emotional intelligence (X2) had a significant effect on organizational citizenship behavior (OCB) (Y2) directly or indirectly through organizational commitment (Y1).

Table 4 The calculation result of a direct and indirect effect of independent variables on dependent variables

Sub Structure	Influence between Variables	Path Coefficient		Total Effect
		Direct	Indirect	
Sub Structure 1	X1 → Y1	0.731	-	0.731
	X2 → Y1	0.172	-	0.172
Sub Structure 2	Y1 → Y2	0.047	-	0.047
	X1 → Y1 → Y2	0.444	0.731 x 0.047 = 0.034	0.478
	X2 → Y1 → Y2	0.327	0.172 x 0.047 = 0.008	0.335

In this case, hypotheses 1 and 2 results became the basis for calculating the direct and indirect effects of organizational support (X1) and emotional intelligence (X2) on organizational citizenship behavior (OCB) through the mediation of organizational commitment (Y1). Based on the calculation results in Table 4, it is concluded that the total effect of organizational support (X1) (0.478) and emotional intelligence (X2) (0.335) variables on organizational citizenship behavior (OCB) (Y2) was more significant than the direct effect of organizational support (X1) (0.444) and emotional intelligence (X2) (0.327). These results prove that organizational commitment in this study was positioned as a mediating variable in the influence between organizational support and emotional intelligence in shaping employees' organizational citizenship behavior (OCB) at the Central Bureau of Statistics (BPS) in Medan City.

Discussion

Based on the path analysis test results, this study has proven the truth of hypotheses 1 and 2. Thus, organizational predictors in the form of organizational support and individual predictors in the form of emotional intelligence could simultaneously form employees' organizational citizenship behavior. The organizational support provided by the Central Bureau of Statistics to employees in the form of rewards, working conditions, welfare, and full support (Eisenberger et al., 1986) was perceived positively by employees. Theoretically, employees' perceptions of organizational support are determined mainly by whether the organization can meet employee expectations regarding things that should be received from the organization. The principle of reciprocity applies in this case (Rhoades & Eisenberger, 2002), i.e., there is a mutually beneficial exchange between the organization's and employees' interests. Hence, it is concluded that the obtained results confirm the current state of knowledge that organizational support is a principal factor determining an employee's organizational citizenship behavior (Frenkel & Bednall, 2016; Saputra & Supartha; 2019; Ansori & Wulansari, 2021).

Employees also had a relatively proficient level of emotional intelligence in terms of understanding their condition, managing emotions, motivating themselves to perform well, empathizing with others, and having social skills in interacting with various parties (Goleman, 1998). Theoretically, employees' emotional intelligence level is determined by one work experience (Al-Fawaeer & AlKhatib, 2020). Based on the characteristics of the research respondents, the respondents had a long working period of 3-5 years to adapt to their work environment, which had implications for good emotional intelligence. Good emotional intelligence will then manifest in good organizational citizenship behavior as well. Thus, it is concluded that the obtained results verify the current state of knowledge (Sahafi et al., 2011; Ibrahim, 2013; Naghdi & Shatalebi, 2013).

Between the two independent variables, the organizational support variable was a stronger organizational predictor in shaping employee organizational commitment than individual predictors of emotional intelligence. The relatively high level of employee commitment could be seen from feeling happy to spend the rest of the career in the organization, loyal to last a long time working in the organization, and having no intention to move to another company even though they get a better offer in another organization (Griffin, 2004). Thus, this study's results align with the findings of Celep and Yilmazturk (2012) and Khan et al. (2014), stating a significant positive relationship between organizational support and emotional intelligence on organizational commitment.

Based on the second hypothesis test results, it was concluded that organizational support and emotional intelligence variables significantly affected organizational citizenship behavior mediated by the organizational commitment of employees at the Central Bureau of Statistics Medan City (Table 3). The organizational commitment variable in this research model was positioned as a partial mediation variable. A partial mediation variable means that the variable can be placed as a mediating variable and an independent variable in the research model (Baron & Kenny, 1986; Suliyanto, 2011).

Moreover, Griffin (2004) and Mowday et al. (1979) define organizational commitment as an individual's relative strength to identify with the organization and be deeply involved, including trust, support for the goals and values of the organization, a powerful desire to work hard for, and a strong will to maintain membership in the organization. Organizational commitment is also an attitude variable that significantly affects various positive employee behaviors, including OCB. However, the diversity of individual characters in organizations can provide distinct levels of organizational commitment. The way individuals perceive organizational situations also contributes significantly to employee organizational commitment. The previous research results (Ardi & Sudarma, 2015; Fazio, 2015; Devece et al., 2016; Pigome et al., 2019; Siregar et al., 2019; Wilkanandya & Sudarma., 2020) have also proven that there was a substantial contribution of organizational commitment in making employees' OCB more dominant. Hence, this phenomenon justifies this research to place organizational commitment as a mediating variable between organizational antecedents, i.e., organizational support and individual antecedents, namely emotional intelligence, on employee OCB. It is consistent with Junita (2017), who concluded that the organizational commitment variable is one of the employee attitude variables appropriately positioned as a mediating variable. The placement of the organizational commitment variable as a mediating variable is also in line with the research findings of Aisyah and Wartini (2016), Junita (2017), and Junita et al. (2019), concluding that the organizational commitment variable is one of the employee attitude variables appropriately positioned as a variable mediation. Thus, the obtained results confirm the current state of knowledge.

Conclusion

Organizational citizenship behavior of employees is formed by various organizational and individual factors. In this case, organizational support represented organizational factors, and emotional intelligence signified individual factors. Directly, organizational support and emotional intelligence variables contributed significantly to the emergence of superior levels of employee OCB at the Central Bureau of Statistics in Medan City. In addition, the organizational support variable was a stronger organizational predictor in shaping employee organizational commitment than emotional intelligence as an individual predictor.

Indirectly, organizational support and emotional intelligence variables significantly affected organizational citizenship behavior (OCB) through organizational commitment. Compared with the enormous contribution of influence, the indirect effect of organizational support and emotional intelligence on OCB through organizational commitment contributed more than the direct effect without going through organizational commitment as a mediating variable.

Further, theoretical implications provide that organizational aspects in the form of support for employees and individual aspects related to emotional intelligence are essential in conditioned organizations to generate levels of organizational commitment and organizational citizenship behavior (OCB), which contribute positively to the

organization. Therefore, further research exploring other predictors needs to be conducted, among others, related to the diversity of individual employee characteristics. Further research with a larger sample size also needs to be done. It is related to the limitations of this research in the number of respondents. Thus, more significant respondents will allow the generalization of research findings and more accurate scientific justification.

Practically, the leader of the Central Bureau of Statistics in Medan City should try to increase the positive attitude of employees, especially organizational commitment, because it plays a significant role in generating high employee OCB, among others, by providing more intensive organizational support as a strong organizational predictor to generate a high level of employee organizational commitment. Organizations also need to conduct in-depth personality tests to detect the level of individual emotional intelligence of employees who work in the field and interact with the community for better work effectiveness.

References

Aisyah, L. N., & Wartini, S. (2016). Pengaruh kepemimpinan transformasional dan kualitas kehidupan kerja pada Organizational Citizenship Behavior (OCB) melalui komitmen organisasional, *Management Analysis Journal*, 5(3), 229-243. Retrieved from https://journal.unnes.ac.id/sju/index.php/maj/article/view/11519

Al-Fawaeer, M., & Alkhatib, A. W. (2020). The Effect of Emotional Intelligence of Operational Team Leaders on the Performance of Team Members. *Research in World Economy, 11*(5), 266-278. https://doi.org/10.5430/rwe.v11n5p266

Alkerdawy, M. M. A. (2014). The Mediating Effects of Duty Orientation on the Relationship between Perceived Organizational Support and Organizational Citizenship Behavior in the Public Banks of Egypt. *International Journal of Business and Management, 9*(8), 155-169. https://doi.org/10.5539/ijbm.v9n8p155

Allen, D. G., Shore, L. M., & Griffeth, R. W. (2003). The Role of Perceived Organizational Support and Supportive Human Resource Practices in the Turnover Process. *Journal of Management, 29*(1), 99–118. https://doi.org/10.1177/014920630302900107

Ansori, M. A., & Wulansari, N. A. (2021). The effect of perceived organizational support and psychological capital on OCB: mediating role of engagement. *Diponegoro International Journal of Business, 4*(2), 69-81. https://doi.org/10.14710/dijb.4.2.2021.69-81

Ardi, R., & Sudarma, K. (2015). Pengaruh Perssepsi Dukungan dan Keadilan Organisasi terhadap Organizational Citizenship Behavior dengan Komitmen Organisasional sebagai Variabel Intervening. *Management Analysis Journal, 4*(2), 142-152. Retrieved from https://journal.unnes.ac.id/sju/index.php/maj/article/view/7821

Arifin, N., Fu'ad, E. N., & Argadea, E. I. (2022). Antecedents of Organizational Citizenship Behavior. *Journal of Management and Entrepreneurship Research, 2*(2), 88–104. https://doi.org/10.34001/jmer.2021.12.02.2-20

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182. https://doi.org/10.1037/0022-3514.51.6.1173

Blau P. M. (1964). *Exchange and power in social life*. New York: J. Wiley.

Bodjrenou, K., Xu, M., & Bomboma, K. (2019). Antecedents of Organizational Commitment: A Review of Personal and Organizational Factors. *Open Journal of Social Sciences, 7*(5), 276–289. https://doi.org/10.4236/jss.2019.75024

Borman, W. C., & Motowidlo, S. J. (1997). Task Performance and Contextual Performance: The Meaning for Personnel Selection Research. *Human Performance, 10*(2), 99–109. https://doi.org/10.1207/s15327043hup1002_3

Borucki, C. C., & Burke, M. J. (1999). An examination of service-related antecedents to retail store performance. *Journal of Organizational Behavior, 20*(6), 943–962. https://doi.org/10.1002/(sici)1099-1379(199911)20:6%3C943::aid-job976%3E3.0.co;2-9

Busharmaidi. (2020). Sikap Kewirausahaan, Budaya Organisasi, dan Komitmen Terhadap Kinerja Penyuluh Industri IKM Indonesia. *Jurnal Riset Manajemen Sains Indonesia, 11*(2), 300–319. https://doi.org/10.21009/jrmsi.011.2.06

Celep, C., & Yilmazturk, O. E. (2012). The relationship among organizational trust, multidimensional organizational commitment and perceived organizational support in educational organizations, *Procedia – Social and Behaviour Sciences*, 46, 5763-5776. https://doi.org/10.1016/j.sbspro.2012.06.512

Chuang, C.-H., & Liao, H. (2010). Strategic human resource management in service context: Taking care of business by taking care of employees and customers. *Personnel Psychology, 63*(1), 153–196. https://doi.org/10.1111/j.1744-6570.2009.01165.x

Daud, F. (2012). Pengaruh Kecerdasan Emosional (EQ) dan Motivasi Belajar terhadap Hasil Belajar Biologi Siswa SMA 3 Negeri Kota Palopo. *Jurnal Pendidikan dan Pembelajaran, 19*(2), 243-255. Retrieved from http://journal.um.ac.id/index.php/pendidikan-dan-pembelajaran/article/view/3475

Eisenberger, R., & Stinglhamber, F. (2011). *Perceived organizational support: Fostering enthusiastic and productive employees.* American Psychological Association. https://doi.org/10.1037/12318-000

Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology, 71*(3), 500–507. https://doi.org/10.1037/0021-9010.71.3.500

Erdogan, B., & Enders, J. (2007). Support from the top: Supervisors' perceived organizational support as a moderator of leader-member exchange to satisfaction and performance relationships. *Journal of Applied Psychology, 92*(2), 321–330. https://doi.org/10.1037/0021-9010.92.2.321

Fachriansyah, R., Yuliati, U., & Riyanto, D. W. U. (2021). The Effect of Organizational Support Perception, Organizational Change, and Organizational Culture on Employee Performance of PT. Pegadaian Malang During COVID-19. *Jurnal Manajemen Bisnis dan Kewirausahaan, 1*(3), 188–198. https://doi.org/10.22219/jamanika.v1i3.18214

Fannon, D. (2018. The relationship between emotional intelligence and leadership style in educational leaders. *Theses and Dissertations.* Pepperdine University.

Farhan, M., & Alfin, E. (2019). The Effect of Emotional Intelligence and Self Effycacy Towards Students Achievement. *Jurnal Ilmiah Pendidikan Matematika, 8*(1), 37-46. http://dx.doi.org/10.25273/jipm.v8i1.4669

Fazio, J. (2015). The interaction of perceived organizational support and emotional intelligence: mediated moderated effects on work outcomes. *Dissertation.* Nova Southeastern University.

Ferdinand, A. (2014). *Metode Penelitian Manajemen, Edisi 5.* Semarang: Badan Penerbit Universitas Diponegoro.

FLICC, (2011). *FLICC Competencies Model for Federal Librarians.* Retrieved from
http://www.loc.gov/flicc/publications/Lib_Compt/2011/2011Competencies.pdf

Frenkel, S. J., & Bednall, T. (2016). How training and promotion opportunities, career
expectations, and two dimensions of organizational justice explain discretionary work
effort. *Human Performance, 29*(1), 16–32.
https://doi.org/10.1080/08959285.2015.1120306

Ghozali, I. (2017). *Ekonometrika teori, konsep dan aplikasi dengan SPSS 17.* Semarang: Badan
Penerbit Universitas Diponegoro.

Goleman, D. (1995). *Emotional intelligence: why it can matter more than IQ.* New York: Bantam
Books.

Goleman, D. (1998). *Working with emotional intelligence.* New York: Bantam Books.

Goleman, D., Boyatzis, R. and McKee, A. (2002). *Primal Leadership: Realizing the Power of
Emotional Intelligence.* Harvard Business School Press, Boston.

Goller, I., Dewi, I. G. A. M. (2020). Pengaruh kecerdasan Emosional, Komitmen
organisasional, dan budaya organisasi terhadap organizational citizenship behavior, E-
Jurnal Manajemen, 9(7), 2810-2829. :
https://doi.org/10.24843/EJMUNUD.2020.v09.i07.p17

Greenberg, J. & Baron, R.A. (2003). *Behavior in organizations understanding and managing the
human side of work.* New Jersey: Prentice-Hall International.

Griffin, R. W. (2004). *Komitmen organisasi.* Jakarta: Erlangga.

Gunduz, Y. (2014). The effect of organizational support on organizational commitment. *The
Anthropologist, 18*(40), 1041-1057. https://doi.org/10.1080/09720073.2014.11891587

Hakim, W., Nimran, U., Haerani, S., & Alam, S. (2014). The antecedents of Organizational
Citizenship Behavior (OCB) and their effect on performance: study on public
university in Makassar, South Sulawesi, Indonesia. *IOSR Journal of Business and
Management,* 16(2), 5-13.

Ibrahim, I. (2013). Pengaruh kecerdasan emosional terhadap organizational citizenship
behavior dan dampaknya pada kinerja perawat Rumah Sakit Umum Anutapura &
Rumah Sakit Undata Palu. *E-Jurnal Katalogis*, 1(1), 136-146. Retrieved from
http://jurnal.untad.ac.id/jurnal/index.php/Katalogis/article/view/6847

Junita, A. (2017). Organizational Learning Culture, Consumer Satisfaction and Employee's
Attitude: Causality Analysis. *Jurnal Dinamika Manajemen, 8*(1), 68-82.
https://doi.org/10.15294/jdm.v8i1.10412

Junita, A., D. Saragih, F., & Atmoko, A. W. (2019). Banking Service Orientation Model in
Strategic HRM and System Dynamics Perspective. *Jurnal Manajemen dan Kewirausahaan,
21*(1), 9–20. https://doi.org/10.9744/jmk.21.1.9-20

Khan, A., Masrek, M. N., & Nadzar, F. M. (2014). The relationship between emotional
intelligence and organizational commitment of Pakistan University librarians, *Pakistan
Journal of Information Management and Libraries*, 15, 1-22. Retrieved from
http://journals.pu.edu.pk/journals/index.php/pjiml/article/viewArticle/1635

Khan, N. U., Wu, W., Saufi, R. B. A., Sabri, N. A. A., & Shah, A. A. (2021). Antecedents of
Sustainable Performance in Manufacturing Organizations: A Structural Equation
Modeling Approach. *Sustainability, 13*(2), 897. http://dx.doi.org/10.3390/su13020897

Lew, T. Y. (2009). Perceived organizational support: linking human resource management
practices with affective organizational commitment, professional commitment and
turnover intention. *The Journal of International Management Studies*, 4(2), 104-115.
Retrieved from http://hdl.handle.net/20.500.11937/30497

Mathis, R. L. & Jackson, J. H. (2011). *Human resource management. 13ᵗʰ Ed.* USA: South-
Western, Cengage Learning.

McShane, S. L., & Von Glinow M. A. (2010). *Organizational behavior. 5th Ed.* New York: McGraw-Hill.

Metria, K., & Riana, G. I. (2018). Pengaruh dukungan organisasi terhadap komitmen organisasi dan kinerja pegawai, *E-Jurnal Ekonomi dan Bisnis Universitas Udayana*, 7(9), 2117-2146. https://doi.org/10.24843/eeb.2018.v07.i09.p02

Meyer, J. P., & Allen, N. J. (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review, 1*(1), 61–89. https://doi.org/10.1016/1053-4822(91)90011-z

Michel, J. W. (2016). Antecedents of Organizational Citizenship Behaviors: Examining the Incremental Validity of Self-Interest and Prosocial Motives. *Journal of Leadership & Organizational Studies, 24*(3), 385–400. https://doi.org/10.1177/1548051816683895

Mowday, R. T., Porter, L. W., & Steers, R. M. (1982). *Consequences of Employee Commitment, Turnover, and Absenteeism.* Employee–Organization Linkages. 135–168. https://doi.org/10.1016/b978-0-12-509370-5.50010-1

Mowday, R. T., Steers, R. M., & Porter, L. W. (1979). The measurement of organizational commitment. *Journal of Vocational Behavior, 14*(2), 224–247. https://doi.org/10.1016/0001-8791(79)90072-1

Mustika, S. I., Rahardjo, K., & Prasetya, A. (2020). The Effect of Perceived Organizational Support and Psychological Capital on Job Satisfaction and Knowledge Sharing. *Bisnis & Birokrasi: Jurnal Ilmu Administrasi dan Organisasi, 27*(1): 25-33. https://doi.org/10.20476/jbb.v27i1.11761

Naghdi, M., & Shatalebi, B. (2013). The Predictability of the Organizational Citizenship Behavior through Emotional Intelligence Dimensions in Personnel of Isfahan Municipality. *Kuwait chapter of Arabian Journal of Business & Management Review, 2*(5), 36-44. https://doi.org/10.12816/0001186

Novianti, K. R. (2021). Does Organizational Commitment Matter? Linking Transformational Leadership With Organizational Citizenship Behavior (OCB). *Jurnal Aplikasi Manajemen, 19*(2), 335 – 345. http://dx.doi.org/10.21776/ub.jam.2021.019.02.09

Nurzaman, L., & Amalia, L. (2022). The Effect of Emotional Intelligence and Spiritual Intelligence on Lecturer Work Performance. *Eligible : Journal of Social Sciences, 1*(1), 50–71. https://doi.org/10.53276/eligible.v1i1.11

Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome.* Lexington Books/D. C. Heath and Com.

Organ, D. W. (1990). The motivational basis of organizational citizen ship behavior. In B. M. Staw, & L. L. Cummings (Eds.), *Research in organizational behavior* (pp. 43-72). Greenwich, CT: JAI Press.

Organ, D. W. (1997). Organizational citizenship behavior: it's construct clean-up time, *Human Performance*, 10(2), 19-33. https://doi.org/10.1207/s15327043hup1002_2

Organ, D. W., & Konovsky, M. (1989). Cognitive versus affective determinants of organizational citizenship behavior, *Journal of Applied Psychology*, 74(1), 57-164. https://doi.org/10.1037/0021-9010.74.1.157

Organ, D. W., Podsakoff, P. M., & MacKenzie, S. B. (2006). *Organizational citizenship behavior: Its nature, antecedents, and consequences.* SAGE Publications, Inc., https://dx.doi.org/10.4135/9781452231082

Osman, R. H., Abdul Ghani, M., & Alis, N. (2019). Antecedents of Organizational Citizenship Behaviour Among Public / Civil Employees: A Scoping Review. *International Journal of Education, Psychology and Counseling, 4*(32), 338–350. https://doi.org/10.35631/ijepc.4320029

Parimita, W., Purwana, D., & Suhud, U. (2020). Antecedent organizational commitments in creative industry in Indonesia. *Talent Development & Excellence*, *12*(1), 1813-1824.

Pigome, H., Sapiri, M., & Abduh, T. (2019). Pengaruh Kecerdasan Emosional, Komitmen Organisasi dan Organizational Citizenship Behavior Terhadap Kinerja Perawat Rumah Sakit Umum Daerah Kabupaten Paniai Propinsi Papua. *Indonesian Journal of Business and Management, 1*(2), 48–58. Retrieved from https://journal.unibos.ac.id/jbm/article/view/316

Putranto, H. T., Sudjadi, A., & Indrayanto, A. (2019). The impacts of perceived organizational support to organizational commitement and psychological well being in contractual employees. *International Conference on Rural Development and Entrepreneurship 2019: Enhancing Small Business and Rural Development Toward Industrial Revolution 4.0.*

Rhoades, L., & Eisenberger, R. (2002). Perceived organizational support: A review of the literature. *Journal of Applied Psychology, 87*(4), 698–714. https://doi.org/10.1037/0021-9010.87.4.698

Robbins, S. P., & Judge, T. A. (2018). *Perilaku organisasi. 12th Ed.* Jakarta: Penerbit Salemba Empat.

Sahafi, E., Danaee, H., Sarlak, M. A., & Haghollahi, F. (2011). The impact of emotional intelligence on citizenship behavior of physicians (with Emphasis on infertility specialists). *Journal of Family and Reproductive Health*, *5*(4), 111-118. Retrieved from https://jfrh.tums.ac.ir/index.php/jfrh/article/view/130

Salkojani, M. A., Chegini, M. G., & Kilidbari, H. R., (2012). The relationship between emotional intelligence and mental health of employees, *Trends in Social Science*, 4(1), 51-57.

Salovey, P., & Mayer, J. D. (1990). Emotional intelligence. *Imagination, Cognition and Personality, 9*(3), 185–211. https://doi.org/10.2190/DUGG-P24E-52WK-6CDG

Saputra, P. E. W., & Supartha, I. W. G. (2019). Pengaruh budaya organisasi dan dukungan organisasi terhadap OCB dimediasi oleh komitmen organisasional, *E-Jurnal Manajemen*, 8(12), 7134-7153. https://doi.org/10.24843/EJMUNUD.2019.v08.i12.p12

Sari, N. I. P., Junita, A., & Ritonga, I. M. (2021). Hubungan Kepemimpinan Melayani Terhadap Perilaku OCB dengan Pemberdayaan Pekerja dan Interaksi Atasan Bawahan Sebagai Pemediasi serta Gender Sebagai Pemoderasi. *Jurnal Administrasi Bisnis, 10*(1), 65-76. https://doi.org/10.14710/jab.v10i1.36131

Sarwono, J. (2012). *Path analysis dengan SPSS: teori, aplikasi, prosedur analisis untuk riset skripsi, tesis, dan disertasi.* Jakarta: Alex Media Komputindo.

Siregar, E., Luddin, M. R., & Suyatno, T. (2019). The Effect of Organizational Commitment and Organizational Citizenship Behavior Toward Service Quality at Universitas Kristen Indonesia. *International Journal of Human Capital Management, 3*(1), 58-73. https://doi.org/10.21009/IJHCM.03.01.06

Sugiyono, P. D. (2013). *Metode penelitian manajemen.* Bandung: Alfabeta, CV.

Suliyanto, S. (2011). *Ekonometrika terapan teori dan aplikasi dengan SPSS.* Yogyakarta: CV. Andi Offset.

Susskind, A. M., Kacmar, K. M., & Borchgrevink, C. P. (2007). How Organizational Standards and Coworker Support Improve Restaurant Service. *Cornell Hotel and Restaurant Administration Quarterly, 48*(4), 370–379. https://doi.org/10.1177/0010880407300158

Suwandewi, N.K.N., & Dewi, I.G.A.M. (2016). Pengaruh kecerdasan emosional dan dukungan organisasional terhadap organizational citizenship behavior. *E-Jurnal Manajemen Unud*, 5(6), 3958-3985. http://ojs.unud.ac.id/index.php/Manajemen/article/view/20258

Thaib, E. N. (2013). Hubungan antara prestasi belajar dengan kecerdasan emosional. *Jurnal Ilmiah Didaktika,* 13(2): 384–399. https://doi.org/10.22373/jid.v13i2.485

Van Dyne, L., Cummings, L. L., & Parks, J. M. (1995). Extra-role behaviors: in pursuit of construct and definitional clarity (a bridge over muddied waters). *Research in Organizational Behavior : An Annual Series of Analytical Essays and Critical Reviews, 17*, 215.

Wijaya, N. A., & Yuniawan, A. (2017). Analisis Pengaruh Budaya Organisasi dan Dukungan Organisasi Terhadap Organizational Citizenship Behavior dengan Komitmen Organisasi sebagai Variabel Intervening (Studi pada Karyawan bagian antaran PT. Pos Indonesia Processing Center Semarang). *Diponegoro Journal of Management, 6*(4), 666-678. Retrieved from https://ejournal3.undip.ac.id/index.php/djom/article/view/18014

Wilkanandya U, Sudarma K. (2020). The role of organizational commitment in Improving organizational citizenship behavior. *Management Analysis Journal*, 9(3): 300-309. Available from: https://journal.unnes.ac.id/sju/index.php/maj/article/view/36883.

Zhang, L., Cao, T., & Wang, Y. (2017). The mediation role of leadership styles in integrated project collaboration: an emotional intelligence perspective. *International Journal of Project Management*, 36(2), 317-330. https://doi.org/10.1016/j.ijproman.2017.08.014