

## Behavioral-Focused Strategy: Mediating the Effect of Motivation on Research Performance

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### **Abstract**

*The study aims to investigate the effect of extrinsic and intrinsic motivation on academic research performance mediated by behavioral-focused, natural reward, and constructive thought strategies. Based on Social Cognitive Theory, extrinsic and intrinsic motivation enable individuals to develop effective strategies that, in turn, will increase their work performance. The research was conducted using a quantitative survey (N = 216) of lecturers from leading universities in Indonesia. Data was collected through an online survey using a validated questionnaire from previous literature. Data analysis was conducted using PLS-SEM. The study's findings reveal that behavioral-focused strategy mediates the relationship between Academic Extrinsic Motivation and Academic Intrinsic Motivation on Academic Research Performance. However, the natural reward and constructive thought strategies do not mediate the relationship. These results contribute to the existing literature on self-leadership, emphasizing the influence of extrinsic and intrinsic motivation through behavioral-focused strategy. The findings have implications for higher education management.*

**Keywords:** Behavioral-Focused Strategy, Self-Leadership, Academic Research Performance, Higher Education

## INTRODUCTION

Research is a foundation for innovation and progress in various areas of human life, including education, health, economic development, and social domains. There have been positive developments in the last decade, but countries should increase public investment in research and development (Cauwels & Sornette, 2022; Ioannidis, 2018; Schwab et al., 2020). Universities that have played a crucial role in generating knowledge and fostering innovation for a long time (Lee et al., 2020). Numerous research conducted to predict improvement of academic research performance (Diop & Asongu, 2023; Heng et al., 2020; Tuan et al., 2022). The human resources approach is considered as one of the effective methods to enhance research performance including extrinsic and intrinsic motivation (Ocampo et al., 2022; Perdomo-Ortiz et al., 2021; Ryazanova & Jaskiene, 2022). However, there is still a lack of research that highlights researcher behavior as a predictor, especially in the form of more effective strategies for improving research performance.

Self-leadership is a multi-dimensional concept that has three different dimensions: behavior-focused strategy, natural reward strategy, and constructive thought strategy. This behavioral and cognitive strategies research explores the role of predictors. The strategies that will be used are part of the concept of self-leadership. Self-leadership is an increasingly recognized concept (Goldsby et al., 2021; Harari et al., 2021; Klösel, 2022) in human resource development and is used to predict performance.

However, this research will use the three strategies of self-leadership as variables. Using behavioral-focused, natural rewards, and constructive thought strategies as variables that can be compared will add to researchers' understanding of self-leadership in a more focused way. To date, no research has been found in the literature that specifically highlights the performance of researchers concerning the three strategies. Examining the role of the three strategies as mediation will further broaden this understanding. The research results will be valuable

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for human resource managers and researchers in developing more focused and effective programs to support academics in achieving optimal research performance.

Therefore, the research questions for this study are: To what extent do behavioral-focused strategy, natural reward strategy, and constructive thought strategy influence academic research performance? How do behavioral-focused strategy, natural reward strategy, and constructive thought strategy act as mediators between academic extrinsic motivation, academic intrinsic motivation on academic research performance?

## **LITERATURE REVIEW**

The research is based on Bandura's social cognitive theory, which explains how individuals interact with personal, behavioral, and social/environmental factors to enhance their performance.

### **Academic Research Performance**

The concept of academic research performance has been defined and measured through various approaches by researchers. Tartari et al. (2020) define academic research performance as the quantity of research output measured through the total number of journal articles published by a researcher at a particular time. Furthermore, Heng et al. (2020) adopted a broader definition by considering academic research performance as the total number of published works, including journal articles, book chapters, conference papers, research grants, and patents. Fauzi et al. (2019) adopted a subjective perspective, defining academic research performance as academics' perceptions and assessments of their success and contribution to the field of research. The definition of Perceived Academic Research Performance in this study refers to academics' perceptions and assessments of their success and contribution to the field of research.

### **Academic Extrinsic Motivation**

The definition of Academic Extrinsic Motivation in this study is operationalized from the definition of extrinsic motivation (Vroom, 1964). In this research, the Academic Extrinsic Motivation variable is defined as the drive within an individual to conduct research activities influenced by the belief that his efforts will result in research performance that leads to rewards which are valuable to him. The Academic Extrinsic Motivation measurement scales were adapted from the Academic Motivation Scale (AMS-C 28) (Vallerand et al., 1992). To adapt to the academic research context, the measurement indicators utilize extrinsic motivation factors identified in previous research (Lambovska & Yordanov, 2020).

### **Academic Intrinsic Motivation**

Academic Intrinsic Motivation is operationalized based on intrinsic motivation (Ryan & Deci, 2000). Academic Intrinsic Motivation in this study is defined as the drive within an individual to conduct research because of the pleasure that arises from the research activity itself. The Academic Intrinsic Motivation measurement scales were adapted from the Academic Motivation Scale (AMS-C 28) (Vallerand et al., 1992). To adapt to the academic research context, the measurement indicators utilize intrinsic motivation factors identified in previous research (Lambovska & Yordanov, 2020).

### **Self-Leadership: Behavioral-Focused, Natural Reward, and Constructive Thought Strategies**

Self-leadership is a multi-dimensional concept that has three different dimensions: behavioral-focused strategy, natural reward strategy, and constructive thought strategy. Each strategy in self-leadership has been utilized as a variable in numerous studies. However, these strategies have been examined and implemented less frequently than self-leadership. In this study, each strategy will be used as a mediation variable.

The Behavioral-focused strategy is defined as a strategy that focuses on behavior, including goal setting, efforts to achieve goals, and independent observation of the performance achieved. Natural reward strategy is a cognitive strategy that includes imagining successful performance and rewarding oneself by rewarding something one likes when successfully completing a task. Constructive thought strategy is thinking about beliefs and assumptions when facing difficult situations, talking to yourself or having an internal dialogue to evaluate the accuracy of beliefs and assumptions.

### **The Effect of Academic Extrinsic Motivation on Perceived Self-Leadership and Perceived Academic Performance**

Based on the Social Cognitive Theory, academic extrinsic motivation drives motivational processes, such as goal-setting, self-evaluation, outcome expectations, and values. Individuals set goals, develop strategies to achieve them, and then evaluate their progress towards those goals (Schunk & DiBenedetto, 2019).

**H<sub>1</sub>:** Academic Extrinsic Motivation has a significant positive influence on Behavioral-focused strategy

**H<sub>2</sub>:** Academic Extrinsic Motivation has a significant positive influence on Natural Reward Strategy

**H<sub>3</sub>:** Academic Extrinsic Motivation has a significant positive influence on Constructive Thought Strategy

**H<sub>4</sub>:** Academic Extrinsic Motivation has a significant positive influence on Academic Research Performance

### **The Effect of Academic Intrinsic Motivation on Perceived Self-Leadership and Perceived Academic Performance**

Based on the social cognitive theory, academic intrinsic motivation drives motivational processes, such as goal-setting, self-evaluation, outcome expectations, and values. Individuals set goals, develop strategies to achieve them, and then evaluate their progress towards those goals (Schunk & DiBenedetto, 2019).

**H<sub>5</sub>:** Academic Intrinsic Motivation has a significant positive influence on Behavioral-focused strategy

**H<sub>6</sub>:** Academic Intrinsic Motivation has a significant positive influence on Natural Reward Strategy

**H<sub>7</sub>:** Academic Intrinsic Motivation has a significant positive influence on Constructive Thought Strategy

**H<sub>8</sub>:** Academic Intrinsic Motivation has a significant positive influence on Academic Research Performance

### **The Effect of Behavioral-focused strategy on Perceived Academic Performance**

Behavioral-focused strategy focuses on increasing self-awareness to manage behavior related to tasks, including unpleasant tasks. These behaviors include self-goal setting, self-observation, self-goal setting, and self-feedback (Harari et al., 2021; Houghton et al., 2012; Knotts et al., 2022). Self-goal setting, determining specific targets that are considered to improve performance. Self-observation, increasing self-awareness, and determining evaluation standards for performance results. Self-feedback, including giving rewards or self-correcting feedback/punishment. Referring to Social Cognitive Theory, the Behavioral-focused strategy is enabled by the ability of self-regulation to control thoughts and actions using self-determined standards. It also involves the ability to self-reflect to assess the adequacy of actions by evaluating the results (Bandura, 2001). Previous research shows that self-leadership behavioral-focused strategies increase job satisfaction and have a positive effect on performance (Politis, 2006). Lin (2017) also reported that behavioral-focused strategy positively affects individual creativity.

**H<sub>9</sub>:** Behavioral-focused strategy has a significant positive effect on Academic Research Performance.

### **The Effect of Natural Reward Strategy on Perceived Academic Performance**

The natural reward strategy is a cognitive approach that involves incorporating enjoyable elements into a task or activity to enhance satisfaction, a sense of self-control, competence, and purposefulness (Harari et al., 2021; Houghton et al., 2012; Knotts et al., 2022; Neck & Manz, 1996). Natural reward strategies involve building natural motivation, including internalizing goals into tasks to create inherently enjoyable aspects of an activity. The emphasis is on intrinsic rewards that encourage individuals to work for their value, not external rewards.

According to social cognitive theory, the natural reward self-leadership strategy is enabled by a person's ability to plan actions that will lead to desired and enjoyable outcomes (Bandura, 1986). Furthermore, this strategy involves elements of competence and self-control, allowing an individual to identify and manage naturally enjoyable activities.

Previous studies have utilized natural reward strategies as a predictor. The natural reward strategy influences sales performance (Singh et al., 2018). Carmeli et al. (2006) report that natural reward-focused strategies are

significantly and positively related to employees' innovative behavior. Natural reward strategies were positively and significantly related to job performance (Mayfield et al., 2021).

**H<sub>12</sub>:** Natural Reward Strategy has a significant positive effect on Academic Research Performance.

### **The Effect of Constructive Thought Strategy on Perceived Academic Performance**

The constructive thought strategy focuses on managing thought patterns by emphasizing positive mental processes to enhance individual performance (Harari et al., 2021; Houghton et al., 2012). This approach involves recognizing negative beliefs and assumptions, practicing positive self-talk, and developing constructive mental images. The goal is to raise awareness of one's internal dialogue and replace irrational or pessimistic self-talk with more functional and optimistic thoughts (Houghton et al., 2012; Knotts et al., 2022).

In Social Cognitive Theory, Constructive Thought Strategy is enabled by two abilities: the ability to symbolize and vicarious learning. Symbolization abilities are crucial for processing and transforming visual experiences, especially in the initial testing of potential solutions using symbols (Bandura, 1986). Vicarious learning allows individuals to seek guidance to initiate and control behavior and thought patterns (Bandura, 1977), facilitating engagement in constructive thinking strategies.

A previous study on Constructive Thought Strategy reported that the strategies are related to job satisfaction. This strategy can reduce dysfunctional thought processes, increase subjective well-being, and improve job satisfaction (Houghton & Jinkerson, 2007).

**H<sub>15</sub>:** Constructive thought strategy has a significant positive effect on Academic Research Performance.

### **The role of Behavioral-focused, Natural Reward and Constructive thought strategy mediates the influence of Academic Extrinsic Motivation and Academic Intrinsic Motivation on Perceived Academic Research Performance**

As described by social cognitive theory (Manz, 1986; Neck & Houghton, 2006), self-leadership strategies encompass a dual control function. Therefore, this strategy can serve as a mediator. Many previous studies use the self-leadership strategies variables as mediators (Kör, 2016; Mayfield et al., 2021; Park et al., 2016; Phillips et al., 2022; Widayani et al., 2017; Yim & Lee, 2021; Yingjun et al., 2021). Few studies use their strategies separately, including behavioral-focused strategy as a mediator between promotion and prevention-focused variables and individual creativity (Lin, 2017).

This study explores the potential mediating effects of behavioral-focused, natural reward, and constructive thought strategies on motivation and perceived academic research performance. The purpose is to understand in detail whether each of these strategies effectively mediates the influence of motivation on performance. Therefore, the following hypotheses are proposed.

**H<sub>10</sub>:** Behavioral-focused strategy significantly mediates the effect of Academic Extrinsic Motivation on Perceived Academic Research Performance.

**H<sub>11</sub>:** Behavioral-focused strategy significantly mediates the effect of Academic Intrinsic Motivation on Perceived Academic Research Performance.

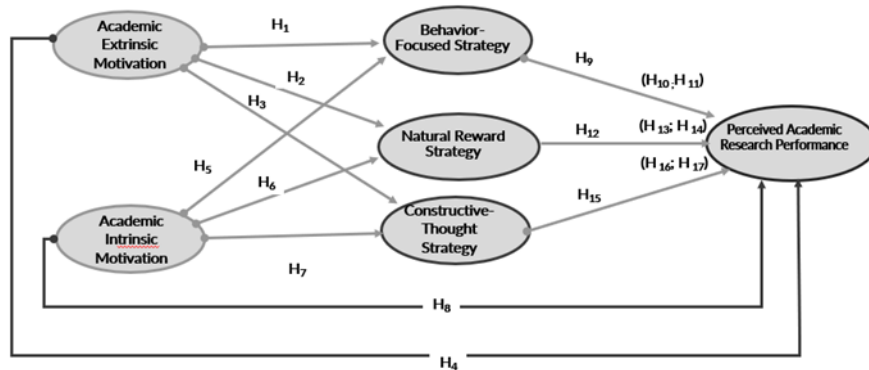
**H<sub>13</sub>:** Natural Reward Strategy significantly mediates the effect of Academic Extrinsic Motivation on Perceived Academic Research Performance.

**H<sub>14</sub>:** Natural Reward Strategy significantly mediates the effect of Academic Intrinsic Motivation on Perceived Academic Research Performance

**H<sub>16</sub>:** Constructive thought strategy significantly mediates the effect of Academic Extrinsic Motivation on Perceived Academic Research Performance.

**H<sub>17</sub>:** Constructive thought strategy significantly mediates the effect of Academic Intrinsic Motivation on Perceived Academic Research Performance

The following is the research framework or conceptual structure utilized in this research. Figure 1. Research framework



## RESEARCH METHOD

The study uses a quantitative research method and a survey-based research design. It focuses on lecturers employed at specific cluster universities as the target population. The selection criteria for research participants required them to be permanent lecturers, not currently on study assignments, and not at the professor level. The study's required sample size was determined using power analysis (Hair et al., 2022; Hair, Risher, et al., 2019).

The research instrument was created by modifying The Short Multidisciplinary Research Performance Questionnaire (SMRPQ) (Daumiller et al., 2019), the Academic Motivation Scale (AMS-C 28) (Vallerand et al., 1992), the Research Questionnaire Model (Klieme & Schmidt-Borcherding, 2023), and The Abbreviated Self-Leadership Questionnaire (ASLQ) developed by Houghton & Neck (2002). The questionnaire underwent content validity assessment by expert judgment, and its reliability and validity were confirmed through a pilot involving 43 participants. Data for this study was collected cross-sectionally.

The data analysis method used in this research is the multivariate analysis technique called Partial Least Square - Structural Equation Model (PLS-SEM) (Bougie & Sekaran, 2019; Hair et al., 2022). PLS-SEM is suitable for this study's objectives, which are causal-predictive-oriented, exploratory, and explanatory.

## RESULTS AND DISCUSSION

Table 1 shows the demographic description of respondents who met the criteria to be included in data processing.

Table 1. Respondents demographic profile

Description	Category	N	Percentage (%)
Gender	Male	77	36
	Female	139	64
	Total	216	100
Age	30 - 40 years	69	32
	41 - 50 years	78	36
	51 - 60 years	54	25
	> 61 years	13	6
	22 - 30 years	2	1
	Total	216	100
Domicile	Bali, Kalimantan, Sulawesi	15	7
	Jawa	174	81
	Sumatera	27	13

N = number of individuals.

According to the data in

Table 1, more than 60% of the respondents are female, and the rest, are male. In terms of age, the respondents were distributed as follows: the largest group falls within the 41-50 years category, followed by the 30-40 years category, and then the 51-60 years category. The respondents' domicile describes the university's location, which is the target population. Respondents with these characteristics can provide information in accordance with the research objectives. The statistical method used in this research is the non-parametric PLS-SEM method, which can accommodate abnormal data. However, Ringle et al. (2023) suggest the need to know the normality of the data to choose confidence intervals in significance tests and suggest reporting the mean, median, minimum-maximum observed value, standard deviation, kurtosis, and skewness of research data. The results of descriptive statistical analysis are presented in Table 2.

**Table 2. Variable descriptive statistics (standardized)**

Variable	Mean	Median	Observed min	Observed max	SD	Excess kurtosis	Skewness
Academic Extrinsic Motivation	0.000	0.088	-3.883	1.314	1.000	1.067	-1.002
Academic Intrinsic Motivation	0.000	0.170	-4.006	1.023	1.000	1.004	-0.947
Academic Research Performance	0.000	-0.033	-2.661	2.173	1.000	-0.291	0.127
Behavioral-Focused Strategy	0.000	0.085	-3.121	1.651	1.000	0.090	-0.490
Constructive Thought Strategy	0.000	0.010	-3.226	1.478	1.000	0.396	-0.470
Natural Reward Strategy	0.000	0.106	-2.587	1.723	1.000	0.203	-0.443

SD = standard deviation.

Table 2 shows the results of descriptive statistics from the standardized PLS-SEM output, which shows the nature of the data distribution—the most considerable median standardized value in Academic Intrinsic Motivation. The largest minimum observed value was found for Academic Intrinsic Motivation at -0.4006, and the smallest maximum observed value was found at 1.023. All excess kurtosis values do not exceed -2 and +2, which indicates that the data distribution tends to be normal. The skewness values are between -1 and +1, indicating that the data tends to be symmetrical. Thus, it can be concluded that the distribution of this research data tends to be normal.

Table 3 displays the results of the outer model evaluation. Reliability indicators measured by outer loading should be higher than 0.7, but indicators between 0.4 and 0.7 should also be considered. Construct reliability is indicated by Cronbach's alpha and composite reliability values higher than 0.7. Construct/convergent validity is measured by the AVE value, which should be higher than 0.5 (Hair, Risher, et al., 2019; Ringle & Sarstedt, 2016).

**Table 3. Loading Factor, Composite Reliability, Cronbach's Alpha, Rho A dan AVE**

Variable	Indicator	Outer Loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Academic Extrinsic Motivation	AEM3	0.780	0.769	0.782	0.866	0.683
	AEM6	0.843				
	AEM8	0.855				
Academic Intrinsic Motivation	AIM1	0.806	0.936	0.938	0.947	0.690
	AIM2	0.864				
	AIM3	0.845				
	AIM4	0.853				
	AIM5	0.818				
	AIM6	0.854				
	AIM7	0.811				

Variable	Indicator	Outer Loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
	AIM8	0.789				
Academic Research Performance	ARP1	0.755	0.888	0.889	0.915	0.642
	ARP1	0.769				
	ARP1	0.804				
	ARP2	0.862				
	ARP3	0.834				
	ARP4	0.776				
Behavioral-Focused Strategy (LOC)	BFS1	0.922	0.863	0.865	0.917	0.788
	BFS2	0.927				
	BFS3	0.808				
Constructive Thought Strategy (LOC)	CTS1	0.758	0.833	0.889	0.900	0.751
	CTS2	0.940				
	CTS3	0.891				
Natural Reward Strategy (LOC)	NRS1	0.925	0.854	0.864	0.932	0.872

Results in Table 3 show that all outer loading is higher than 0.7. Cronbach's alpha and composite reliability values were higher than 0.7. Construct/convergent validity is measured by the AVE value higher than 0.5. Therefore, the measurement is reliable and valid.

**Table 4. HTMT ratio**

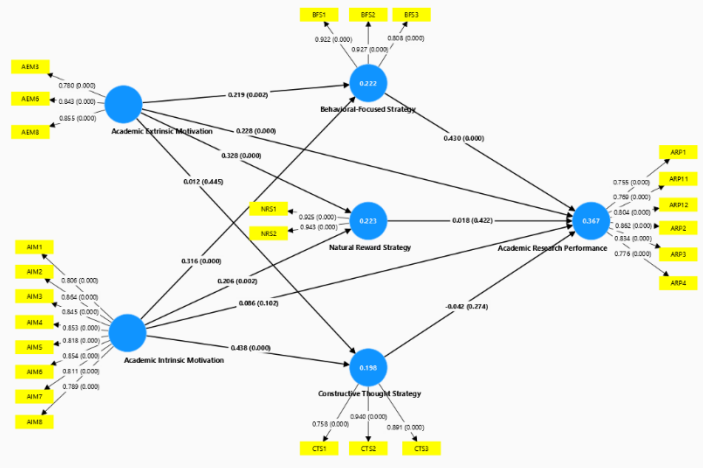
Variable	AEM	AIM	ARP	BFS	CTS	NRS
Academic Extrinsic Motivation						
Academic Intrinsic Motivation	0.641					
Academic Research Performance	0.518	0.413				
Behavioral-Focused Strategy	0.469	0.479	0.628			
Constructive Thought Strategy	0.304	0.493	0.254	0.471		
Natural Reward Strategy	0.539	0.418	0.487	0.801	0.530	

All the HT/MT values shown in Table 4, are below 0.9 and 0.85, indicating that the measurement is valid.

This study examines the effects of extrinsic and intrinsic motivation on academic research performance mediated by behavioral-focused, natural reward, and constructive thought strategies using Partial Least Squares Structural Equation Modeling (PLS-SEM). The study tests 17 hypotheses: 11 hypotheses for direct effects and six hypotheses for mediation effects. The primary hypothesis posits that behavioral-focused, natural reward, and constructive thought directly influence academic research performance while extrinsic and intrinsic motivation have an indirect effect mediated by behavioral-focused, natural reward, and constructive thought strategies.

Figure 1 displays the inner model evaluation results with bootstrapping procedure with 10,000 resamples.

*Behavioral-focused strategy Mediating the effect of motivation on research performance*



**Figure 1.** Inner model (structural model)

The figure illustrates the structural relationships between variables in the research model, denoted by arrows. Each path or pathway has a p-value (number in brackets). P-value < 0.05 indicates a significant relationship (Hair, Black, et al., 2019).

Table 5 displays the direct effect hypothesis results of the inner model evaluation, including path coefficients, p values, confidence intervals, VIF values, the decisions to support or not support and effect size (F<sup>2</sup>). The VIF value should be lower than 5, the p-value < 0.05, and the confidence interval (CI) does not include zero. F<sup>2</sup> values of 0.02, 0.15 and 0.35 indicate the predictor construct's small, medium and large effects on the endogenous construct (Hair et al., 2022).

**Table 5. Direct Effect Hypothesis Testing Results**

H	Path	Std. Coefficient	p-value	CI		Supported/ Not Supported	VIF	f <sup>2</sup>
				5.0%	95.0%			
H <sub>1</sub>	Academic Extrinsic Motivation → Behavioral-Focused Strategy	0.219	0.002	0.097	0.349	Supported	1.411	0.044
H <sub>2</sub>	Academic Extrinsic Motivation → Natural Reward Strategy	0.328	0.000	0.205	0.449	Supported	1.411	0.098
H <sub>3</sub>	Academic Extrinsic Motivation → Constructive Thought Strategy	0.012	0.445	-0.129	0.159	Not Supported	1.411	0.000
H <sub>4</sub>	Academic Intrinsic Motivation → Academic Research Performance	0.228	0.000	0.125	0.333	Supported	1.566	0.052
H <sub>5</sub>	Academic Intrinsic Motivation → Behavioral-Focused Strategy	0.316	0.000	0.195	0.431	Supported	1.411	0.091
H <sub>6</sub>	Academic Intrinsic Motivation → Natural Reward Strategy	0.206	0.002	0.088	0.322	Supported	1.411	0.039
H <sub>7</sub>	Academic Intrinsic Motivation → Constructive Thought Strategy	0.438	0.000	0.323	0.550	Supported	1.411	0.170
H <sub>8</sub>	Academic Intrinsic Motivation → Academic Research Performance	0.086	0.102	-0.027	0.197	Not Supported	1.716	0.007



Path	Std. Coefficient	p-value	CI		Supported/ Not Supported	VIF	f <sup>2</sup>
			5.0%	95.0%			
<b>H<sub>9</sub></b> Behavioral-Focused Strategy → Academic Research Performance	0.430	0.000	0.304	0.552	Supported	2.024	0.144
<b>H<sub>12</sub></b> Natural Reward Strategy → Academic Research Performance	0.018	0.422	-0.130	0.162	Not Supported	2.144	0.000
<b>H<sub>15</sub></b> Constructive Thought Strategy → Academic Research Performance	-0.042	0.274	-0.153	0.078	Not Supported	1.416	0.002

SC = standardized coefficient.

In Table 5, the results indicate that the statistical analysis of the study has provided enough evidence to support 7 out of the 11 proposed hypotheses. The direct effect is significant and positive for hypotheses **H<sub>1</sub>**, **H<sub>2</sub>**, **H<sub>4</sub>**, **H<sub>5</sub>**, **H<sub>6</sub>**, **H<sub>7</sub>**, and **H<sub>9</sub>**. Hypotheses **H<sub>3</sub>** and **H<sub>8</sub>** were not supported due to non-significant p-values and confidence intervals that include zero.

Table 6 presents the results of hypothesis testing for the indirect effect and mediation analysis to determine whether the type is complementary/partial or indirect only/full mediation.

**Table 6. Indirect Effect Hypothesis Testing Results**

Path	SC	p-value	CI		Supported/ Not Supported	Mediation
			5.0%	95.0%		
<b>H<sub>10</sub></b> Academic Extrinsic Motivation → Behavioral-Focused Strategy → Academic Research Performance	0.094	0.004	0.041	0.156	Supported	Complementary (partial mediation)
<b>H<sub>11</sub></b> Academic Intrinsic Motivation → Behavioral-Focused Strategy → Academic Research Performance	0.136	0.000	0.075	0.205	Supported	Indirect Only (full mediation)
<b>H<sub>13</sub></b> Academic Extrinsic Motivation → Natural Reward Strategy → Academic Research Performance	0.006	0.424	-0.041	0.058	Not Supported	No Mediation
<b>H<sub>14</sub></b> Academic Intrinsic Motivation → Natural Reward Strategy → Academic Research Performance	0.004	0.427	-0.029	0.035	Not Supported	No Mediation
<b>H<sub>16</sub></b> Academic Extrinsic Motivation → Constructive Thought Strategy → Academic Research Performance	-0.001	0.472	-0.013	0.009	Not Supported	No Mediation
<b>H<sub>17</sub></b> Academic Intrinsic Motivation → Constructive Thought Strategy → Academic Research Performance	-0.019	0.277	-0.068	0.036	Not Supported	No Mediation

SC = standardized coefficient.

In

Table 6, the results indicate that the statistical analysis of the study has provided enough evidence to support 2 out of the 6 mediation hypotheses. The indirect effect is significant and positive for hypotheses **H<sub>10</sub>** and **H<sub>11</sub>**.

Hypotheses **H<sub>13</sub>**, **H<sub>14</sub>**, **H<sub>16</sub>**, and **H<sub>17</sub>** were not supported due to non-significant p-values and confidence intervals that include zero.

The following sections will provide a detailed interpretation of each supported direct and indirect/mediation hypothesis. We will also address the unsupported hypothesis, exploring possible reasons for its lack of significance and offering suggestions for future research:

Academic Extrinsic Motivation has a significant positive influence on Behavioral-focused strategy and Natural Reward Strategy but does not significantly influence Constructive Thought Strategy. Increasing academic extrinsic motivation only affects increasing behavioral-focused and natural reward strategies but does not increase constructive thought strategies.

Academic Intrinsic Motivation has a significant positive influence on Behavioral-focused strategy, Natural Reward Strategy and Constructive Thought Strategy. However, it does not have a noticeable positive impact on academic research performance.

Behavioral-focused strategy has a significant positive direct effect on academic research performance. The Behavioral-focused strategy also mediates the effect of Academic Extrinsic and Intrinsic Motivation on Perceived Academic Research Performance. The type of mediation of Academic Extrinsic Motivation is Complementary (partial mediation), while Academic Intrinsic Motivation is Indirect Only (full mediation).

Statistical analysis did not find significant support for the hypothesis that Natural Reward Strategy has a significant positive effect on Academic Research Performance. Natural Reward Strategy significantly also does not mediate the impact of Academic Extrinsic Motivation on Perceived Academic Research Performance. It also does not mediate the effect of Academic Intrinsic Motivation on Perceived Academic Research Performance.

Statistical analysis shows that the direct path coefficient from the Constructive thought strategy to Academic Research Performance is insignificant, meaning that the Constructive thought strategy does not directly influence Academic Research Performance. Apart from that, the mediation effect is also not significant, as indicated by the insignificance of the path from the Academic Extrinsic Motivation and Academic Intrinsic Motivation to the Constructive thought strategy and from the Constructive thought strategy to the Academic Research Performance.

Table 7 display reported the results of the model quality Evaluation. The explanatory power of the model is measured using the R squared value indicator ( $R^2$ ). The Standardized Root Mean Square Residual (SRMR) value is used to provide model fit information (Guenther et al., 2023). Meanwhile the predictive power of the model, measured using  $Q^2$  and Cross-validated predictive ability test (CVPAT).

**Table 7. Model Quality**

Variable	$R^2$	$Q^2$ predict
Academic Research Performance	0.367	0.205
Behavioral-Focused Strategy	0.222	0.205
Constructive Thought Strategy	0.198	0.173
Natural Reward Strategy	0.223	0.205

Regarding reference values, it was previously believed that  $R^2$  greater than 0.75 had strong explanatory power; 0.50 was categorized as moderate and weak if the value was 0.25;  $> 0.9$ , overfit (Hair et al., 2018). However, it's important to interpret these values carefully, particularly in social research context involving respondents' perceptions. An  $R^2$  value below 0.25 cannot be directly interpreted as indicating poor model quality (Hair et al., 2022; Sarstedt et al., 2023). The SRMR value that indicates good model fit is less than 0.08.

$Q^2$  predict values between 0 and 0.25 indicate that the model has low predictive power. If the  $Q^2$  predict value is in the range of 0.25 to 0.5, the model's predictive ability is considered moderate, and value exceeding 0.5 indicates that the model has strong predictive ability.

In Table 7, the R<sup>2</sup> values range from 0.198 to 0.367, indicating low to moderate explanatory power. The predictive power, with values between 0.173 and 0.205, shows low predictive ability. Meanwhile, the SRMR value of 0.065 suggests that the model has a good fit.

This study utilizes the Cross-validated Predictive Ability Test (CVPAT) as suggested by Hair et al. (2022), Lienggaard et al. (2021), and Sharma et al. (2023). According to the reference, the model demonstrates strong predictive capabilities if the average loss difference value is below zero or a negative value (Hair et al., 2022).

**Table 8. CVPAT**

Variable /Model	Compare to IA (Indicator Average)				Compare to LM (Linear Model)			
	PLS Loss	IA Loss	Avg. Loss Difference	p-Value	PLS Loss	LM Loss	Avg. Loss Difference	p-Value
Academic Research Performance	0.977	1.117	-0.140	0.001	0.977	1.012	-0.035	0.080
Behavioral-Focused Strategy	0.762	0.907	-0.145	0.004	0.762	0.777	-0.015	0.553
Constructive Thought Strategy	0.586	0.663	-0.077	0.004	0.586	0.629	-0.043	0.000
Natural Reward Strategy	0.821	0.995	-0.174	0.003	0.821	0.832	-0.012	0.643
Overall	0.825	0.957	-0.132	0.000	0.825	0.854	-0.029	0.008

Table 8 indicates that the average loss difference value is negative compared to the standard reference value. Therefore, the model exhibits strong predictive capabilities.

As suggested, this study uses the analysis PLS-POS to determine the potential presence of unobserved variations caused by the complexity of phenomena in behavior-related research (Becker et al., 2013; Hair et al., 2022). This advanced model analysis aims to uncover the segment structure and estimate specific parameters for each segment. Based on the results of this analysis, researchers can attempt to elucidate the identified variations (Sharma et al., 2021).

**Table 9. PLS-POS analysis**

Variable	Original R <sup>2</sup>	R <sup>2</sup> Segment	
		Segment 1	Segment 2
Academic Research Performance	0.367	0.776	0.372
Behavioral-Focused Strategy	0.222	0.977	0.162
Constructive Thought Strategy	0.198	0.770	0.149
Natural Reward Strategy	0.223	0.960	0.161

N = number of individuals.

In Table 9, the PLS POS analysis shows that the data is divided into two segments, suggesting potential variations that can be further explored to identify segment characteristics. However, there is a significant change in the R<sup>2</sup> value. The increase in the R<sup>2</sup> value indicates that the explanatory power of this variable can be characterized as strong.

This research acknowledges limitations that need to be addressed in future studies. Despite the rigorous methods to ensure data consistency, PLS-POS analysis indicated that unobserved heterogeneity was still found within the data. The analysis revealed the presence of 2 distinct data segments that could impact the conclusions drawn from the research. Therefore, further investigation, such as conducting additional analysis to identify the unique attributes of each respondent segment, is required.

## CONCLUSION

This study aimed to evaluate the predictors of academic research performance, focusing on academic extrinsic and intrinsic motivation, behavioral-focused strategy, natural reward and constructive strategy. Findings provide support for nine of the 17 proposed hypotheses. Behavioral-focused strategy is found to have

significant positive direct effects on academic research performance. Behavioral-focused strategies also mediate Academic extrinsic motivation. The behavioral-focused strategy mediation is complementary or partial because extrinsic motivation also directly influences academic research performance. In contrast, the role of behavioral-focused strategy in mediating Academic intrinsic motivation is classified as indirect only or full mediation because, in this study, the evidence did not support the hypothesis that academic intrinsic motivation directly affects academic research performance.

This study expands the existing literature by demonstrating that Behavioral-focused strategies are a significant predictor of academic research performance and play a crucial role in enhancing both extrinsic and intrinsic motivation.

The findings of this research have practical implications for managing human resources in higher education institutions, emphasizing the importance of the behavioral strategy, especially in encouraging academicians to prepare specific personal performance targets, focusing on working towards achieving the targets that have been set, and regularly recording progress in achievements.

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*Behavioral -focused strategy Mediating the effect of motivation on research performance*

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