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The Role of Peer Support in Mediating the Effect of Self-Control on Students' Academic Procrastination

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Abstract:

Academic procrastination is a persistent challenge in higher education because delaying academic tasks can interfere with learning progress, task completion, and the achievement of academic goals. This behavior is influenced by both individual and social factors. Self-control represents an important internal resource that enables students to regulate their behavior and academic priorities, while peer support may provide a social context that shapes how students manage academic demands. This study aims to examine the role of peer support in mediating the effect of self-control on students' academic procrastination. A quantitative approach with an explanatory research design was employed, involving 206 students as respondents. Data were collected using instruments measuring self-control, peer support, and academic procrastination. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS. The results showed that self-control had a significant relationship with academic procrastination ($\beta = 0.519$; $p < 0.001$). Self-control also had a significant relationship with peer support ($\beta = 0.623$; $p < 0.001$). In contrast, peer support did not have a significant direct effect on academic procrastination ($\beta = 0.105$; $p = 0.078$). However, the indirect effect of self-control on academic procrastination through peer support was significant ($\beta = 0.323$; $p < 0.001$). These findings indicate that peer support functions as a meaningful mediating mechanism in the relationship between self-control and academic procrastination, even though its direct effect is not statistically significant. The study highlights the importance of integrating individual self-regulation with supportive peer environments when developing strategies to reduce academic procrastination among university students.

Keywords; academic procrastination; mediation; peer support; self-control; students.

INTRODUCTION

Academic procrastination is a form of behavior that can hinder the achievement of students' learning goals. This behavior is characterized by a tendency to delay decision-making, postpone task execution, and difficulty completing work within a specified deadline (Steel, 2007). Explains procrastination as the voluntary

postponement of an intended action even though the individual is aware that the delay may have worse consequences. In the educational context, academic procrastination is a significant issue because students are not only required to complete tasks but also to manage time, determine priorities, maintain concentration, and control various impulses that can distract from academic demands. Procrastination is thus not only related to time management issues but also relates to an individual's ability to regulate behavior to achieve long-term goals. In this study, academic procrastination is operationalized through three aspects: decision-making, implementation, and timeliness, which refer to the concept (Steel, 2007).

The tendency to procrastinate can arise when students face tasks that require effort, concentration, and control over the desire to engage in other activities that are considered more enjoyable. This condition indicates that an individual's ability to control themselves is an important aspect in understanding academic procrastination behavior. Self-control relates to a person's ability to control thoughts, emotions, and behavior to remain directed towards the desired goal (Tangney et al., 2004). Individuals with good self-control conceptually have a greater ability to regulate behavior, maintain discipline, delay immediate gratification, and engage in activities that support goal achievement. In an academic context, this ability is necessary for students to maintain engagement in tasks despite facing distractions, boredom, or the urge to engage in other activities. The concept of self-control used in this study refers to Tangney, Baumeister, and Boone, which encompasses five aspects: self-discipline, deliberate/non-impulsive, healthy habits, work ethic, and reliability. These five aspects describe an individual's ability to exercise self-discipline, consider consequences before acting, maintain healthy habits, have a work ethic, and be reliable in carrying out responsibilities. With these characteristics, self-control theoretically has strong relevance to academic behavior, particularly when students must decide whether to complete an assignment immediately or postpone it (Tangney et al., 2004).

The relationship between self-control and academic procrastination has also been a focus of previous research. Setiawan and Maulana (2022) demonstrated a negative relationship between self-control and academic procrastination in high school students. Students with higher levels of self-control were reported to have lower levels of procrastination due to their better ability to control impulses, maintain focus, and prioritize academic demands. Similar findings were also reported by Puspitasari and Kurniawan (2023), who showed that self-control plays a role as a predictor of academic procrastination. Thus, self-control can be viewed as an important internal psychological resource in addressing the tendency to procrastinate on academic tasks (Lutfhi et al., 2022; Nazmi et al., 2022). However, students' academic behavior does not occur solely within their individual psychological context. Students are individuals who live in a social environment and interact intensively with their peers. During the developmental period of high school, peers can be a source of support that influences students' academic experiences. Peer support can take the form of attention, emotional encouragement, tangible assistance, information provision, or exchange of ideas related to academic activities. Chen defines peer support in an academic context as support derived from students' friendships and related to academic activities, which can ultimately be related to students' academic achievement and engagement in school (L. Chen & Y, n.d.).

In this study, peer support encompasses three aspects: emotional support, instrumental support, and cognitive support (L. Chen & Wang, 2024). Emotional support can include providing encouragement, attention, and support to students in achieving their academic goals. Instrumental support involves tangible assistance, such as helping with assignments or providing time and resources for learning activities. Meanwhile, cognitive support relates to the exchange of ideas, discussions, and perspectives that help students understand and make decisions related to their academic goals. These three forms of support demonstrate that peers not only function as part of a student's social environment but can also serve as a context for regulating academic behavior and activities.

Peer support has also been linked to academic procrastination. Wulandari and Yulianto (2020) showed that peer support is related to students' levels of academic procrastination. Students who receive better support from peers tend to have lower levels of procrastination. This support can take the form of emotional encouragement, assistance in completing assignments, reminders about deadlines, or collaborative learning activities. Another finding reported by Ningsih and Pratama showed that students with strong social support from peers tend to exhibit more consistent study habits and lower levels of procrastination. These findings provide the basis for considering students' social contexts when explaining academic procrastination (Pradipta et al., 2023). However, the relationship between peer support and academic procrastination should not always be understood as a direct relationship. The social support

students receive may not automatically result in changes in academic behavior if students lack the ability to manage, direct, and implement that support in their actual behavior. Thus, it is important to examine the possibility of psychological processes that bridge the relationship between individual and social factors and academic behavior. This perspective directs attention to more specific questions regarding how self-control, peer support, and academic procrastination relate to each other within a single model.

Previous research summarized in this proposal generally shows that self-control and peer support are factors related to academic procrastination. Research on self-control indicates that self-control ability is associated with a lower tendency to procrastinate (Kurniawan, 2023; Setiawan, 2022), while research on peer support indicates that stronger support is also associated with a lower tendency to procrastinate (Pradipta et al., 2023; S. Wulandari et al., 2025). In fact, Lestari and Ningsih demonstrated that self-control and peer support are jointly related to academic procrastination. Thus, previous research provides an empirical basis for suggesting that both internal and social factors are relevant to academic procrastination (Ningsih et al., 2025). However, research focused solely on examining direct effects has not fully explained the mechanisms underlying the relationship between variables. The relationship between internal and social factors and academic procrastination can be more complex because student behavior is shaped through the interaction of personal abilities and their social environment. Therefore, this study positions peer support as a mediating variable in the relationship between self-control and academic procrastination. This mediator allows the study to answer not only the question of whether self-control is related to academic procrastination but also whether this relationship can be explained by the support students receive from their peers.

The mediation perspective is important because the influence of a variable on behavior is not always direct. Internal psychological factors and social conditions can interact through more complex processes. In the context of this study, self-control is positioned as the independent variable, peer support as the mediator variable, and academic procrastination as the dependent variable. This model allows for testing the direct effect of self-control on academic procrastination as well as the indirect effect through peer support. The research proposal explicitly formulates these four relationships as the focus of the test: the effect of self-control on academic procrastination, the effect of self-control on peer support, the effect of peer support on academic procrastination, and the mediating role of peer support. The need to examine these mechanisms becomes even more relevant considering the multidimensional nature of peer support. Emotional, instrumental, and cognitive support can provide different social experiences for students. Emotional support can provide a sense of appreciation and encouragement, instrumental support can help students face the demands of concrete tasks, and cognitive support can help students exchange information and consider academic decisions (L. Chen & Wang, 2024). Thus, peer support can be part of a broader process in shaping students' academic behavior.

This study was conducted on high school students using a quantitative explanatory approach. This approach was chosen because the research aimed to explain the relationships and influences between variables through hypothesis testing. Data were analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS) through SmartPLS software, allowing for the testing of direct and indirect relationships between variables within a single model. This pattern of results provides an important contribution to the understanding of academic procrastination. The insignificant direct relationship between peer support and academic procrastination suggests that the presence of social support alone is not always sufficient to explain changes in procrastination behavior. Conversely, the significant indirect effect suggests that peer support needs to be understood in relation to the psychological mechanisms that accompany this relationship. These findings open the way for academic procrastination to be viewed as a behavior influenced by the interaction between individual capacity and social context, rather than solely by either factor in isolation.

These findings also provide a rationale for expanding previous research that tends to place self-control and peer support as direct predictors of academic procrastination. When the direct effect of peer support is insignificant but the indirect effect in a mediation model is significant, the relationship between the variables becomes more precisely understood through a more complex mechanism. Thus, the novelty of this research lies in its attempt to explain the role of peer support as a mechanism in the relationship between self-control and students' academic procrastination, rather than simply examining whether the three variables are interrelated. Conceptually, this research is expected to contribute to the development of educational psychology studies, particularly in understanding the internal and social factors related to

academic procrastination. Practically, the research findings can be considered by schools in designing efforts that are not only oriented towards improving individual student abilities but also pay attention to the quality of interactions and support between peers within the school environment. The research proposal also positions improving self-control and peer support as a basis for helping minimize students' academic procrastination.

Based on the above description, this study aims to analyze the role of peer support in mediating the influence of self-control on students' academic procrastination. Specifically, this study examines the influence of self-control on academic procrastination, the influence of self-control on peer support, the influence of peer support on academic procrastination, and the indirect influence of self-control on academic procrastination through peer support. With this focus, this study is expected to provide a more comprehensive understanding of the mechanisms of the relationship between self-control, the social environment of peers, and the tendency towards academic procrastination in students.

LITERATURE REVIEW

1. Academic Procrastination

Academic procrastination is the behavior of individuals delaying academic activities that should be completed, even though the individual knows that the delay can have unfavorable consequences. (Steel, 2007) explains procrastination as a voluntary delay in planned actions even though the individual is aware that the delay can have negative impacts. In an academic context, procrastination can be demonstrated through students' tendencies to delay starting or completing assignments, delaying decision-making related to assignments, and not completing work according to predetermined deadlines. This concept positions procrastination not simply as a matter of delay, but as a form of failure to regulate behavior when individuals are faced with academic demands (Pranawukir & Hamboer, 2021).

In this study, academic procrastination refers to three aspects developed based on Steel's concept: decision-making, implementation, and timing. The decision-making aspect relates to an individual's tendency to delay starting or completing an academic activity. The implementation aspect relates to the tendency to delay carrying out actions that have actually been planned. Meanwhile, the timeliness aspect relates to an individual's ability to complete an activity according to a predetermined time. These three aspects indicate that academic procrastination encompasses the processes before the action, the implementation of the action, and the completion of the action (Rohani et al., 2025). Academic procrastination is a relevant issue in education because students face various demands that require self-management skills. Completing academic assignments requires not only the ability to understand the material but also the ability to determine priorities, manage time, maintain concentration, and control the urge to engage in more enjoyable activities. Therefore, psychological factors related to the ability to regulate and control behavior are important to consider in explaining the emergence of academic procrastination.

2. Self-Control

Self-control is an individual's ability to control thoughts, emotions, and behavior to remain directed toward desired goals. Tangney et al. view self-control as an individual's ability to self-regulate so as to control responses and behaviors that are inconsistent with goals. In an academic context, self-control enables students to direct their behavior toward learning demands despite impulses or distractions that can hinder goal achievement (Tangney et al., 2004). This study uses the concept of self-control developed by Tangney, Baumeister, and Boone. This construct consists of five aspects: self-discipline, deliberate/non-impulsive action, healthy habits, work ethic, and reliability. Self-discipline describes an individual's ability to maintain discipline in carrying out obligations (Tangney et al., 2004). Deliberate/non-impulsive action relates to the ability to consider consequences before acting and to resist impulses. Healthy habits relate to the ability to maintain behavioral patterns that support an individual's well-being and goals. Work ethic shows sincerity in carrying out work or responsibilities, while reliability relates to the consistency and ability of an individual to fulfill the responsibilities that have been set.

These five aspects are relevant to academic behavior. Students who are able to maintain discipline, control impulses, maintain goal-supportive habits, and consistently carry out responsibilities conceptually have better self-regulation skills when facing academic demands. Conversely, difficulties in controlling

impulses and maintaining goal-directed behavior can increase the likelihood of students procrastinating on academic activities. The relationship between self-control and academic procrastination has been supported by previous research. Setiawan and Maulana demonstrated a relationship between self-control and academic procrastination in high school students. Research by Puspitasari and Kurniawan also demonstrated that self-control plays a role as a predictor of academic procrastination. These findings support the view that self-control is an internal factor related to students' ability to avoid academic procrastination.

3. Peer Support

Peer support is a form of social support that individuals receive from friendships and relates to both personal and academic needs (Azzahrah et al., 2024). Peer support in an academic context refers to support from peers that can be related to students' academic activities. This support can help students cope with academic demands by providing attention, assistance, information, and encouragement to achieve academic goals. In this study, peer support consists of three aspects: emotional support, instrumental support, and cognitive support. Emotional support relates to the attention, empathy, encouragement, and encouragement students receive from peers. Instrumental support relates to the tangible assistance peers can provide in dealing with academic tasks or activities. Meanwhile, cognitive support relates to the exchange of information, ideas, discussions, and perspectives that can help students understand academic issues and determine appropriate actions.

These three forms of support demonstrate that peers can be a social resource for students in carrying out academic activities. Emotional support can help students cope with stress or difficulties, instrumental support can help address the demands of tasks directly, while cognitive support can provide the information and perspective needed to solve academic problems (W. A. Wulandari & Nugroho, 2024). Thus, peer support is not only related to students' social relationships but also has relevance to how students face and manage their academic demands. The relationship between peer support and academic procrastination has also been previously studied. Wulandari and Yulianto demonstrated that peer support is related to students' academic procrastination. Ningsih and Pratama also reported a relationship between peer social support and students' academic behavior. These findings provide a basis for suggesting that the quality of support students receive from their peer environment may be related to their tendency to complete academic tasks (Mukti & Yulianto, 2020; Pradipta et al., 2023).

4. The Relationship Between Self-Control and Academic Procrastination

The relationship between self-control and academic procrastination can be understood through an individual's ability to regulate goal-oriented behavior. Procrastination occurs when an individual chooses to postpone a planned action despite knowing the consequences of such delay (Steel, 2007). In academic situations, students need to control short-term impulses, such as the desire to engage in more enjoyable activities, in order to continue with tasks that have long-term benefits. This ability is closely related to self-control. Students with self-control are better able to maintain attention on tasks, control impulses, maintain discipline, and complete responsibilities in accordance with established goals (Tangney et al., 2004). Therefore, conceptually, self-control is related to the tendency to academic procrastination. Previous research has also shown a relationship between the two constructs.

5. The Relationship Between Self-Control and Peer Support

The relationship between self-control and peer support is a crucial part of this research model. Individuals do not exercise self-control skills in isolation from their social environment. In the student context, the ability to regulate behavior and carry out academic responsibilities occurs through interactions with peers. The social support an individual receives can be related to how they carry out their academic activities, while individual behavioral characteristics can also influence the patterns of interaction and support received from the social environment. In this study, this relationship was empirically tested by positioning self-control as the independent variable and peer support as the mediator. The research proposal explicitly formulated a hypothesis regarding the influence of self-control on peer support and positioned this relationship as one of the pathways in the research model (Widyaningsih & Savira, 2021). However, the literature available in the thesis document does not provide an equally strong empirical basis for the self-control → peer support relationship as it does for the self-control → academic procrastination

relationship. Therefore, in the final article, this section should be strengthened with literature that specifically addresses the relationship between self-regulation/self-control and the quality or perception of peer support. We should not claim such a relationship based on theory alone.

6. The Relationship Between Peer Support and Academic Procrastination

Peer support can theoretically help students cope with academic demands through emotional, instrumental, and cognitive support. When students receive encouragement, assistance, and information from peers, they gain social resources that assist them in tackling academic tasks. In this context, peer support can be associated with student consistency in academic activities and reduce the tendency to procrastinate (Aisy & Sugiyo, 2021). Previous research in this proposal suggests a negative relationship between peer support and academic procrastination. The findings of Wulandari and Yulianto and Ningsih and Pratama provide empirical evidence that social support from peers can be related to students' procrastination tendencies. However, this relationship is not necessarily direct and consistent across contexts. Differences in student characteristics, forms of support, and underlying psychological processes can prevent peer support from always resulting in immediate changes in procrastination behavior.

7. The Mediation Role of Peer Support

Based on this description, this study considers that the relationship between self-control and academic procrastination needs to be studied not only through direct channels, but also through indirect channels. Peer support is positioned as a mediator to test whether the relationship between self-control and academic procrastination occurs through the social support received by students. The mediation approach allows research to identify the mechanisms of relationships between variables (Parsaoran et al., 2023). In this research model, self-control acts as the independent variable (X), peer support as the mediator variable (M), and academic procrastination as the dependent variable (Y). With this model, the study examines four main pathways: Self-Control → Academic Procrastination, Self-Control → Peer Support, Peer Support → Academic Procrastination, and Self-Control → Peer Support → Academic Procrastination.

Placing peer support as a mediator provides a different perspective than research that only examines direct effects. If peer support is viewed solely as a direct predictor, then research can only explain whether it is related to procrastination. Conversely, a mediation approach allows research to examine whether peer support is part of the mechanism linking self-control to academic procrastination (Nitzl et al., 2016). Thus, this literature review leads to a conceptual model in which self-control is an internal factor, peer support is a social factor that acts as a mediator, and academic procrastination is an academic behavior that is the outcome of the study. This model was then empirically tested using SEM-PLS.

METHOD

This study employed a quantitative approach with an explanatory design. The quantitative approach was used to obtain numerical data regarding students' self-control, peer support, and academic procrastination. Meanwhile, the explanatory design was used to explain the relationships and influences between variables based on the research hypothesis. The research model placed self-control as the independent variable (X), peer support as the mediator variable (M), and academic procrastination as the dependent variable (Y). A structural model was used to examine the direct effect of self-control on academic procrastination, the effect of self-control on peer support, the effect of peer support on academic procrastination, and the indirect effect of self-control on academic procrastination through peer support. The three main variables in this study are multidimensional constructs consisting of several dimensions (Creswell, 2018). Therefore, the analysis was conducted using a second-order construct approach in Partial Least Squares Structural Equation Modeling (PLS-SEM). This approach allows for testing the relationship between indicators and their dimensions as well as the relationship between dimensions and the main construct.

This study was conducted on students of State Vocational High School 7 Medan, North Sumatra, Indonesia. The study population consisted of students who met the characteristics and criteria established in the study. Based on the research data, the number of respondents used in the final analysis was 206 students. Respondents provided data through instruments used to measure self-control, peer support, and academic procrastination. Respondent demographic characteristics, such as gender, age, and grade level,

can be presented in the article if the data are available in the research dataset. This study used three instruments to measure the main constructs: self-control, peer support, and academic procrastination. Each construct was operationalized as a multidimensional construct in accordance with the theoretical basis and instruments used in the study. Self-control is defined as an individual's ability to control thoughts, emotions, impulses, and behaviors to remain directed toward achieving goals. The measurement of self-control in this study refers to the Brief Self-Control Scale (Brief SCS) developed by Tangney, Baumeister, and Boone (2004) and has been adapted into Indonesian by Arifin and Milla. The instrument consists of 13 items (Arifin et al., 2024). In the research measurement model, self-control is represented through five dimensions:

1. Self-Discipline
2. Deliberate/Non-Impulsive Healthy Habits
3. Work Ethic Reliability

These five dimensions represent an individual's ability to maintain self-discipline, control impulsive actions, maintain goal-supportive habits, have a work ethic, and consistently carry out responsibilities. Therefore, self-control is positioned as a second-order construct formed by these five first-order constructs. Peer support is the support students receive from their peers in facing personal needs and academic activities. The concept of peer support in this study refers to the framework developed by Chen and is used to measure peer support in an academic context. Peer support consists of three dimensions, namely: Emotional support relates to the attention, empathy, encouragement, and emotional support provided by peers. Instrumental support relates to the tangible assistance provided by peers in facing academic tasks or activities. Meanwhile, cognitive support relates to the exchange of information, ideas, and perspectives through discussions that can help students understand academic problems and make decisions. Therefore, peer support is positioned as a second-order construct consisting of three first-order constructs, namely emotional support, instrumental support, and cognitive support (Tangney et al., 2004).

Academic procrastination is defined as a student's tendency to delay academic activities despite realizing that such delays may have certain consequences. This study used the Pure Procrastination Scale (PPS), adapted into Indonesian by Ansyah and Pratiwi (2024). The instrument consists of 12 items and uses a five-level Likert scale, ranging from 1 (Very Rarely Done) to 5 (Very Often Done). Academic procrastination is represented through three dimensions:

1. Decision Making Implementation
2. Timing

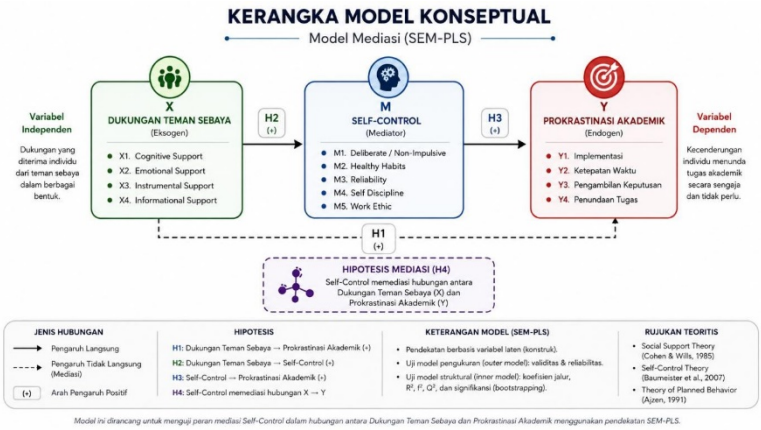
The decision-making dimension consists of three items, implementation consists of five items, and timeliness consists of four items, resulting in a total of 12 items. Thus, academic procrastination is positioned as a second-order construct consisting of three first-order constructs. Data collection was conducted using a research instrument given to respondents according to the characteristics of the study population. The instrument was used to obtain data on self-control, peer support, and academic procrastination. The collected data were then prepared for analysis. The analysis stage began with an examination of the measurement model to ensure that the indicators used were able to represent the construct and its dimensions. After the measurement model met the evaluation criteria, the analysis continued with testing the structural model to examine the relationships between the research variables.

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the assistance of SmartPLS software. PLS-SEM was used because the research model involves several latent constructs, multidimensional constructs, and mediating relationships. PLS-SEM analysis allows researchers to evaluate the measurement model while simultaneously testing the structural relationships between variables within a single model. The analysis was conducted in two main stages:

1. Evaluation of measurement model (measurement model/outer model) Evaluation of structural model (structural model/inner model) Evaluation of Measurement Model.
2. Evaluation of the measurement model is carried out to ensure that the indicators and dimensions used are able to measure the research constructs validly and reliably.

Because the study uses multidimensional constructs, evaluations are conducted at the first-order and second-order levels. At the first-order level, the relationship between indicators and each dimension is tested. Furthermore, at the second-order level, the relationship between dimensions and the main construct

is tested. Evaluation of the measurement model includes convergent validity, construct reliability, and discriminant validity. Convergent validity is evaluated based on outer loading values and Average Variance Extracted (AVE). Construct reliability is evaluated through Cronbach's Alpha and Composite Reliability (CR). Meanwhile, discriminant validity is used to ensure that each construct has distinct characteristics from other constructs. Based on the available SEM-PLS output, indicators in the research constructs show outer loading values ranging from 0.760 to 0.884.



Once the measurement model meets the evaluation criteria, the next step is to evaluate the structural model. Structural model evaluation is conducted to test the relationships between constructs in the research model.

1. The research structural model consists of four main relationships:
2. Self-Control ➡Academic Procrastination
3. Self-Control ➡Peer Support
4. Peer Support➡ Academic Procrastination
5. Self-Control ➡Peer Support➡Academic Procrastination

The structural model was evaluated by examining the path coefficient, coefficient of determination (R^2), effect size (f^2), and the significance of the relationship through a bootstrapping procedure. Mediation analysis was conducted to determine whether peer support acts as a mediator in the relationship between self-control and academic procrastination. The research mediation model can be described as follows:

Self-Control (X) → Peer Support (M) → Academic Procrastination (Y)

Indirect effects were tested using the bootstrapping procedure in SmartPLS. The significance of indirect effects was determined based on the path coefficient, t-statistic, and p-value. Mediation analysis was conducted in conjunction with testing the direct effects. Thus, the study can determine whether peer support plays a mediator role in the relationship between self-control and academic procrastination. The conceptual framework places Peer Support (X) as an exogenous variable, Self-Control (M) as a mediator, and Academic Procrastination (Y) as an endogenous variable. Theoretically, this model does not simply test whether social support is related to procrastination, but explains the psychological mechanisms underlying this relationship through students' self-regulatory capacity. Structurally, Peer Support → Self-Control represents the assumption that a supportive social environment can provide cognitive, emotional, informational, and instrumental resources that help individuals maintain behavioral regulation, discipline, and goal orientation. Furthermore, Self-Control → Academic Procrastination explains that the ability to control impulses, regulate habits, maintain discipline, and direct behavior toward academic goals are important mechanisms in determining the tendency to procrastinate. Thus, self-control is positioned not merely as a direct predictor, but as an internal regulatory mechanism that translates the influence of the social environment into academic behavior.

A direct relationship between Peer Support and Academic Procrastination is necessary to test whether social support has an influence on procrastination that is not fully explained by self-control. If the indirect effect through self-control is significant, then the model provides evidence that the X–Y relationship operates through a mediation mechanism; conversely, if both direct and indirect effects are significant, the relationship indicates partial mediation. This framework therefore provides a stronger explanation than a

simple direct relationship model because it integrates external factors (social support) and internal mechanisms (self-control) in explaining academic procrastination behavior.

An important methodological note: the (+) signs in H1 and H3 in the figure need to be reconsidered. If higher Y scores do indeed indicate higher academic procrastination, theoretically the direction of the relationship between Peer Support → Procrastination and Self-Control → Procrastination is more logically hypothesized to be negative (−). Thus, a theoretically stronger model is likelyah:

X → M (−/+) → Y (−), with X → Y (−).

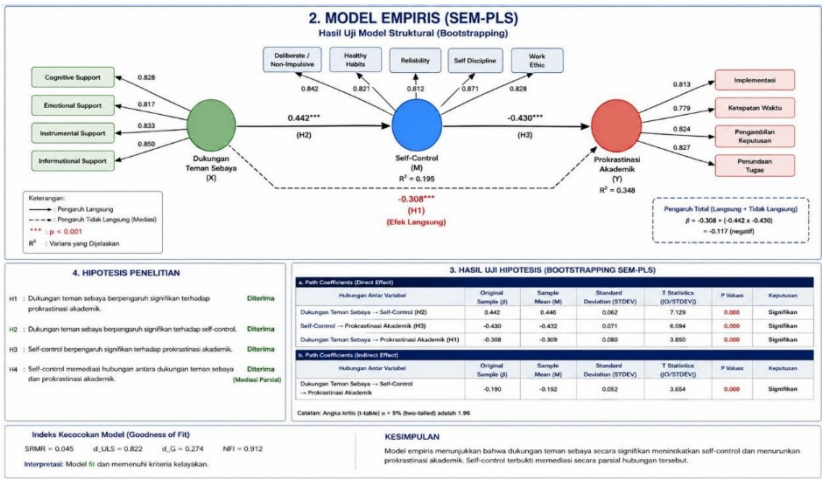
A positive sign can only be maintained if the definition or coding of the variable actually makes higher scores represent different conditions. This is important because in reputable journal articles, the direction of the hypothesis must be consistent across theory, operational definitions, instruments, and interpretation of SEM-PLS path coefficients.

RESULTS AND DISCUSSION

Empirical Model

The empirical model tests the relationship mechanism between Peer Support (X), Self-Control (M), and Academic Procrastination (Y) through the Structural Equation Modeling–Partial Least Squares (SEM-PLS) approach with a bootstrapping procedure. The test results indicate that Peer Support has a positive and significant effect on Self-Control with a path coefficient of β = 0.623; p < 0.001. This finding indicates that the stronger the support students receive from peers, the higher the self-control capacity demonstrated in managing their academic behavior and demands. Furthermore, Self-Control has a positive and significant effect on Academic Procrastination with β = 0.519; p < 0.001. Statistically, this relationship is consistent with the direction of the relationship formulated in the conceptual model. However, the substantive interpretation of this positive direction must be returned to the direction of the scoring of the Academic Procrastination indicator. If high scores truly represent higher levels of procrastination behavior, then this positive relationship requires further theoretical discussion, because in general self-control is expected to function as a mechanism to inhibit procrastination.

In contrast to the two pathways, the direct effect of Peer Support on Academic Procrastination was not significant (β = 0.105; p = 0.078). This means that the presence of direct peer support is not sufficient to explain variations in academic procrastination. This influence appears to operate through a psychological mechanism that is closer to the regulation of individual behavior, namely Self-Control. This finding is supported by the results of the indirect effect test. Peer Support was shown to influence Academic Procrastination through Self-Control with β = 0.323; p < 0.001. Thus, Self-Control was shown to act as a mediator in the relationship between Peer Support and Academic Procrastination. Since the direct effect of X → Y was not significant while the indirect effect of X → M → Y was significant, this pattern can be methodologically interpreted as full mediation.



Respondent Characteristics

This study involved 206 students as respondents. The data obtained were then analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the assistance of SmartPLS software. The analysis

was conducted to evaluate the measurement and structural models and examine the role of peer support in the relationship between self-control and academic procrastination.

Evaluation of Measurement Model

Evaluation of the measurement model was conducted to ensure that the indicators and dimensions used were able to represent the research constructs validly and reliably. Because the study used multidimensional constructs, the evaluation was conducted on first-order and second-order constructs. Based on the results of SEM-PLS data processing, the research indicators showed outer loading values ranging from 0.760 to 0.884. These values indicate that the indicators used have adequate ability to represent the constructs being measured. The self-control construct is represented by five dimensions: self-discipline, deliberate/non-impulsive, healthy habits, work ethic, and reliability. Peer support is represented by emotional support, instrumental support, and cognitive support. Meanwhile, academic procrastination is represented by the dimensions of decision-making, implementation, and timeliness.

Structural Model Evaluation

After the measurement model was evaluated, the analysis continued with the evaluation of the structural model. The evaluation was conducted by examining the coefficient of determination (R^2), path coefficient, t-statistics, p-value, and indirect effects through mediation analysis. The R^2 value for academic procrastination was 0.348, with an adjusted R^2 value of 0.342. This means that the structural model was able to explain 34.8% of the variation in academic procrastination based on the predictor constructs contained in the model. Meanwhile, the R^2 value for self-control was 0.388, with an adjusted R^2 of 0.385. The SRMR value for the estimated model was 0.080. Based on the available results, these values indicate an acceptable level of model residuals.

Hypothesis Testing

Hypothesis testing was conducted using the bootstrapping procedure in SmartPLS, taking into account the path coefficients, t-statistics, and p-values. The test results listed in the research output are as follows:

Table 1.1 Hypothesis Testing of Research Variables

Connection	b	t	p	Results
Peer Support → Academic Procrastination	0,105	1,420	0,078	Not significant
Peer Support → Self-Control	0,623	14,261	<0,001	Significant
Self-Control → Academic Procrastination	0,519	7,891	<0,001	Significant

Source: Processed by researchers, 2026

The Influence of Self-Control on Academic Procrastination

The analysis results show that self-control has a significant influence on students' academic procrastination, with a path coefficient of $\beta = 0.519$, a t-statistic of 7.891, and $p < 0.001$. A p-value less than 0.05 indicates that the relationship between self-control and academic procrastination is statistically significant. Thus, self-control is a construct that has a significant relationship with students' academic procrastination. These results indicate that variations in self-control levels are related to variations in academic procrastination behavior in students. However, the path coefficient obtained is positive ($\beta = 0.519$). Therefore, the direction of this relationship needs to be interpreted carefully. Specifically, this positive result needs to be linked to the direction of instrument scoring and reverse coding on the self-control indicator. Therefore, these results cannot be directly interpreted as meaning that increasing self-control substantively increases academic procrastination before the instrument coding verification process is declared final.

The Influence of Self-Control on Peer Support

In the research model used in this article, peer support is placed as a mediator variable that bridges the relationship between self-control and academic procrastination. Available research output shows a significant relationship between the two constructs with a coefficient of $\beta = 0.623$, t-statistics = 14.261, and $p < 0.001$. Because the p value is smaller than 0.05, the relationship is declared statistically significant. Self-Control → Peer Support. Thus, the results of the analysis indicate that self-control has a significant relationship with peer

support. This finding provides an important basis for testing whether peer support can act as a mechanism that bridges the relationship between self-control and academic procrastination.

The Influence of Peer Support on Academic Procrastination

The analysis results indicate that peer support does not have a significant direct effect on students' academic procrastination. The path coefficient obtained was β = 0.105, with a t-statistic of 1.420 and p = 0.078. Because the p value > 0.05, the direct relationship between peer support and academic procrastination is not statistically significant. Thus, the presence of direct peer support is not sufficient to explain the variation in students' academic procrastination in the research model. This finding is interesting in the research context because peer support does not show a significant direct effect on academic procrastination. In other words, the role of peer support in the research model should not be understood solely as a direct predictor of academic procrastination, but needs to be seen through its role as a mediator variable.

The Role of Peer Support in Mediating the Effect of Self-Control on Academic Procrastination

A mediation analysis was conducted to test whether peer support could act as a mediating mechanism in the relationship between self-control and students' academic procrastination. Based on the available output, the indirect effect showed a β value of 0.323, t-statistics of 6.729, and p < 0.001. A p value less than 0.05 indicates that the indirect effect is statistically significant. In the context of the article model, the mediation relationship is formulated as:

Self-Control → Peer Support → Academic Procrastination

These results indicate a significant indirect effect in the relationship model between self-control, peer support, and academic procrastination. This finding suggests that the relationship between self-control and academic procrastination should be understood not only through its direct influence but also through its relationship with peer support. Thus, peer support plays a crucial role in explaining the interrelationship mechanisms among the variables in this study.

Based on the results of the structural model analysis, the research on "The Role of Peer Support in Mediating the Influence of Self-Control on Students' Academic Procrastination" shows several main findings. *First*, self-control has a significant relationship with academic procrastination, with a path coefficient of β = 0.519 and p < 0.001. These findings indicate that self-control is a construct significantly related to students' academic procrastination.

Second, self-control has a significant relationship with peer support, with a path coefficient of β = 0.623, t-statistics = 14.261, and p < 0.001, based on the available output. *Third*, peer support did not show a significant direct effect on academic procrastination, with β = 0.105, t-statistics = 1.420, and p = 0.078. This finding indicates that peer support does not directly explain academic procrastination in the research model. *Fourth*, the indirect effect showed significant results, with β = 0.323, t-statistics = 6.729, and p < 0.001. These results indicate the existence of an indirect mechanism in the relationship between the variables. Thus, the research findings provide a perspective that the relationship between self-control and academic procrastination needs to be understood not only through a direct relationship, but also by considering peer support as a social mechanism in the research model.

The Influence of Self-Control on Academic Procrastination

The results of the study showed that self-control had a significant relationship with students' academic procrastination, with a path coefficient of β = 0.519 and p < 0.001. These findings indicate that self-control is a factor significantly related to students' tendency to engage in academic procrastination. Theoretically, self-control relates to an individual's ability to control thoughts, emotions, impulses, and behaviors to remain directed toward achieving goals. In an academic context, this ability is necessary when students face tasks that require effort, concentration, and perseverance. Students need to control the urge to engage in other, more enjoyable activities and maintain behaviors that support task completion. These findings are in line with previous research showing a relationship between self-control and academic procrastination. Students with good self-control abilities are conceptually better able to regulate their behavior, maintain discipline, consider consequences before acting, and complete tasks according to predetermined goals.

In this study, self-control was measured through five dimensions: self-discipline, deliberate/non-impulsive behavior, healthy habits, work ethic, and reliability. These five dimensions indicate that self-control in an academic context is not merely the ability to resist momentary impulses, but also encompasses the ability to maintain discipline, develop habits that support goals, have a work ethic, and consistently carry out responsibilities. However, the results of the study showed a positive path coefficient, namely β = 0.519. This positive direction needs to be interpreted cautiously because conceptually the study refers to the assumption that better self-control is related to a lower tendency to procrastinate. Therefore, the direction of the coefficient needs to be linked to the reverse coding process, the direction of item scoring, and data coding before providing substantive interpretation. Thus, the finding that can be safely maintained is that there is a significant relationship between self-control and academic procrastination, while interpretation regarding whether this relationship indicates an increase or decrease in procrastination needs to follow the results of the instrument coding verification.

The Influence of Self-Control on Peer Support

The analysis results show a significant relationship between self-control and peer support, with a coefficient of β = 0.623, t = 14.261, and p < 0.001 on the available output. Within the framework of this study, this relationship is positioned as:

Self-Control → Peer Support

These findings suggest that students' personal abilities are related to the social context they experience within the school environment. Students do not engage in academic activities in isolation from their social environment. Interactions with peers can be part of everyday academic experiences, including when students face assignments, learning difficulties, academic pressure, or the need to maintain motivation. Conceptually, students with strong self-regulation skills are better able to establish and maintain social interactions that support their academic goals. The ability to control impulses, consider the consequences of actions, and maintain responsibility can help students interact constructively with peers. In the context of peer support, these interactions can manifest in the form of emotional, instrumental, or cognitive support. Emotional support can take the form of encouragement and attention, instrumental support can be concrete assistance in academic activities, while cognitive support can include discussions, information exchange, and providing perspective on academic issues (Gai et al., 2026). However, interpretation of this relationship requires consideration of the previously available outputs, which show a reversed direction of the construct. Therefore, the result of β = 0.623 can only be used as final evidence for the Self-Control → Peer Support path after the final SmartPLS model is confirmed using construct naming that corresponds to the article.

The Influence of Peer Support on Academic Procrastination

In contrast to the previous relationship, the results of this study indicate that peer support does not have a significant direct effect on academic procrastination. The path coefficient obtained was β = 0.105, t = 1.420, and p = 0.078. These results indicate that the support students receive from peers does not directly explain the tendency for academic procrastination. This finding is interesting because theoretically, peer support can provide assistance that enables students to better cope with academic demands. The insignificant direct relationship may indicate that social support does not always automatically result in changes in academic behavior. Support provided by peers can take the form of encouragement, assistance with assignments, or the exchange of information, but the decision to use this support to regulate academic behavior still depends on individual characteristics and abilities. Thus, the presence of supportive friends does not necessarily directly stop students from procrastinating. Students still need internal skills to direct their behavior, set priorities, control impulses, and utilize available social support (J. J.-L. Chen, 2008). These findings provide an important perspective for research because they suggest that peer support is better understood in the context of more complex relationships, rather than solely as a direct predictor of academic procrastination.

The Role of Peer Support in Mediating the Effect of Self-Control on Academic Procrastination

The main findings of the study relate to the mediation analysis. The available output indicates an indirect effect of β = 0.323, t = 6.729, and p < 0.001. Statistically, this indirect effect is significant. In the article's model, the mediation relationship is formulated as:

Self-Control → Peer Support → Academic Procrastination

These results indicate that the relationship between self-control and academic procrastination is not only related to a direct relationship but may also involve social mechanisms through peer support. This finding is important because the direct relationship between peer support and academic procrastination was not significant. This condition indicates that the role of a mediator is not necessarily synonymous with the presence of a significant direct effect of the mediator on the dependent variable. The primary concern in mediation analysis is the significance of the indirect effect on the tested path. Conceptually, these findings can be understood through the interaction between internal factors and the social environment (J. J.-L. Chen, 2005). Self-control is an internal resource related to a student's ability to regulate behavior, while peer support is a social resource available within the student's environment. Both can be considered together when explaining academic behavior. However, there are important limitations in interpreting these mediation results. The previously available output indicates the direction of mediation as follows:

Peer Support → Self-Control → Academic Procrastination while the article model stipulates:

Self-Control → Peer Support → Academic Procrastination

Due to the different order of the mediators, the β value of 0.323 cannot be used as final evidence that peer support mediates the effect of self-control on academic procrastination before the final SmartPLS model is verified. Therefore, for journal manuscripts, the discussion of mediation should be finalized after the model direction and specific indirect effect results are fully consistent. The research findings contribute to the understanding of academic procrastination by placing psychological and social factors in one model. Academic procrastination can be understood not only as a time management problem but also related to students' ability to control their behavior and the social context in which they carry out their academic activities. The results regarding self-control reinforce the importance of internal factors in explaining students' academic behavior. Meanwhile, the insignificant direct effect of peer support suggests that social factors may not always operate simply through a direct pathway. By including peer support as a mediator, this study seeks to broaden the understanding from the question "is self-control related to procrastination?" to the more complex question, namely "through what mechanisms does this relationship occur in students' social context?" This perspective is a major contribution of the research because it brings together self-regulation abilities with the social environment of peers in explaining academic procrastination behavior (Tangney et al., 2004).

The research findings have implications for schools, teachers, counselors, and other parties involved in developing students' academic behavior. Efforts to reduce academic procrastination should not only focus on establishing deadlines but also on developing students' ability to regulate their behavior. Self-control can be developed through instilling discipline, time management, prioritization, distraction control, and strengthening responsibility for academic assignments. Furthermore, peer support can be directed toward a supportive learning environment through group work, academic discussions, mutual encouragement, and assistance in overcoming learning difficulties. However, because the direct effect of peer support on academic procrastination was insignificant in the research findings, peer-based programs should not be considered standalone programs. Social support needs to be combined with strengthening students' self-regulation skills to ensure optimal use of available support in academic activities (Hair et al., 2022).

This study shows that the relationship between self-control, peer support, and academic procrastination is not simple. Self-control showed a significant relationship with academic procrastination, while peer support did not show a significant direct effect on academic procrastination. At the same time, the available outputs indicated a significant indirect effect. This pattern demonstrates the importance of viewing academic procrastination through a combination of individual and social factors. Students' ability to control themselves can be related to how they carry out academic activities and interact with their social environment. Therefore, an approach that focuses solely on one factor may not fully explain the complexity of academic procrastination behaviorakademik.

CONCLUSION

This study aims to analyze the role of peer support in mediating the influence of self-control on students' academic procrastination. Based on the analysis, self-control shows a significant relationship with students' academic procrastination. This finding indicates that students' ability to control their thoughts, impulses, and behavior is one of the factors related to their tendency to procrastinate on academic activities. This study also shows a significant relationship between self-control and peer support. These findings indicate that students' internal factors are related to the social context within their peer environment. In the context of this study, peer

support includes emotional, instrumental, and cognitive support that can be part of a student's academic experience. Meanwhile, peer support does not show a significant direct effect on students' academic procrastination. These results indicate that the presence of peer support does not necessarily directly reduce or increase the tendency for academic procrastination. Thus, peer support needs to be understood in relation to the psychological and behavioral processes that accompany students' academic activities. The analysis also shows a significant indirect effect in the research model. These findings indicate that the relationship between self-control and academic procrastination involves mechanisms related to peer support. Thus, this study provides a perspective that the relationship between self-control and academic procrastination needs to be viewed not only through direct influence but also through the students' social context. This study emphasizes the importance of simultaneously considering both internal and social factors in understanding students' academic procrastination. Self-control acts as a psychological factor related to regulating student behavior, while peer support is a social aspect that needs to be considered in understanding the mechanisms of this relationship. These findings contribute to the study of educational psychology by positioning peer support as part of the mechanism linking self-control and academic procrastination. Practically, the results of this study indicate that efforts to reduce students' academic procrastination should not only focus on improving self-control but also consider creating a peer environment that supports academic activities. Schools and educators can develop collaborative learning activities, peer support, academic discussions, and behavioral habits that encourage students to be more disciplined in completing assignments. Thus, this study demonstrates that the role of peer support needs to be considered in understanding the relationship between self-control and students' academic procrastination. However, the final interpretation regarding the form of mediation needs to be based on a SmartPLS model whose construct direction and coding have been verified, so that the resulting conclusions are truly consistent with the research model Self-Control (X) → Peer Support (M) → Academic Procrastination (Y).

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