


“Time is My Own Treasure”: Parental Autonomy Support and Academic Procrastination Among Chinese Adolescents

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Purpose: Previous studies have shown that academic procrastination not only affects middle school students' academic performance but also causes them physical and psychological stress, as well as negative emotions. Therefore, it is necessary to explore the influencing factors of academic procrastination and its internal mechanisms. This study aims to explore the relationship between perceived parental autonomy support and academic procrastination, as well as the role of autonomous motivation and time management disposition.

Participants and Methods: Cross-sectional data from 662 middle school students were collected using the Parental Autonomy Support Scale, Academic Procrastination Inventory for Middle School Students, Academic Self-Regulation Questionnaire and Adolescence Time Management Disposition Scale. SPSS and its PROCESS macro were used for data analysis.

Results: After gender and age were controlled, the results showed that perceived parental autonomy support could not only directly predict middle school students' academic procrastination but also predict three paths of procrastination: (1) the mediating role of autonomous motivation, (2) the mediating role of time management disposition, and (3) the chain mediating role of autonomous motivation and time management disposition.

Conclusion: Autonomous motivation and time management disposition played a chain mediating role in the relationship between perceived parental autonomy support and academic procrastination in middle school students.

Keywords: middle school students, academic procrastination, perceived parental autonomy support, autonomous motivation, time management disposition

Introduction

Procrastination is to voluntarily delay an intended course of action despite expecting to be worse off for the delay.¹ Academic procrastination is the manifestation of procrastination in the school context, which is to voluntarily delay an intended course of study-related action despite expecting to be worse off for the delay.² It can be regarded as a motivational problem that involves more than poor time management skills or trait laziness.³ Studies have shown that academic procrastination not only affects students' academic performance⁴⁻⁶ but also may cause them negative emotions,⁷ such as anxiety about exams and academic tasks.^{8,9} In addition, some researchers have found that there is also a significant relationship between academic procrastination and externalizing problems in forms such as problematic internet usage.¹⁰

Previous studies on academic procrastination have mostly focused on college students, and few studies have researched middle school students, specifically. However, academic procrastination, as a maladaptive academic behaviour, does not appear in the transition stage between middle school and university but develops over the course of years of interactions between students' personal characteristics and their educational environment.¹¹ Therefore, exploring the

influencing factors of academic procrastination and its internal mechanisms with middle school students has theoretical and practical significance for improving academic performance and maintaining student mental health.

Perceived Parental Autonomy Support and Academic Procrastination

Parental autonomy support refers to the affective identification and recognition of one's own free choice and self-determination that an individual obtains from his or her parents.¹² It is an important concept in the framework of self-determination theory (SDT). Parenting styles have a significant impact on adolescent social adjustment, mental health, etc., and play a key role in adolescent academic achievement.^{13,14} Previous research has found that middle school students who report that they perceive more parental autonomy support tend to show higher levels of academic development.¹⁵ There are also studies showing that perceived parental autonomy support can negatively predict the level of academic procrastination in adolescents.¹⁶ However, most of the previous research on parental autonomy support and adolescent academic procrastination is based on Western cultural backgrounds. According to contextual-developmental theory, sociocultural value systems can affect individual's development by influencing their social interactions.¹⁷ That is, under the background of different cultural value orientations, the influence of parent-child interaction on adolescents' psychology and behaviour may be different. Notably, parents in the Chinese cultural context provided less autonomous support than Western parents.¹⁸ Therefore, it is necessary to explore the specific mechanism of parental autonomy support predicting adolescents' academic procrastination in the context of Chinese culture.

Based on the above theoretical and empirical research results, this study puts forward Hypothesis 1: Perceived parental autonomy support can negatively predict the level of academic procrastination among middle school students.

The Mediating Effect of Autonomous Motivation

Autonomic motivation includes intrinsic motivation, identified regulation and integrated regulation, which refers to the willingness of individuals to engage in certain behaviours freely and independently (on account of factors such as interests and personal beliefs).^{19,20} Adolescence is a period of dramatic cognitive development when middle school students conceptualize themselves as autonomous, efficacious individuals.²¹ On the one hand, according to self-determination theory, when familial contexts are more supportive of autonomy, children will experience healthier development, as manifested by more intrinsic motivation, greater internalization and integration of behavioural regulations, and the adoption of intrinsic values for different domains of life.²² That is, parental autonomy support can positively predict children's autonomous motivation.¹⁴ On the other hand, SDT also points out that an individual's behaviour is affected by their motivation,¹² and autonomous motivation, which is of particularly high quality, is the main factor affecting an individual's learning behaviour. Studies have found that individuals who have to perform certain tasks under the pressure of external motivation are more likely to procrastinate than those who are driven by internal motivation to perform the task,²³ and students with high levels of autonomous motivation are less likely to experience academic procrastination.¹¹ A longitudinal study of 886 middle school students found that students' perceived teacher autonomy support significantly predicted their level of autonomous motivation and procrastination.²⁴ A study by Vansteenkiste et al²⁵ with Chinese students found that relative autonomy in studying mediates the relationship between parental autonomy support and adaptive learning strategies.

Based on the above theoretical and empirical research results, we speculate that perceived parental autonomy support can not only directly predict academic procrastination in middle school students but also indirectly predict academic procrastination by positively predicting autonomous motivation. Therefore, this study puts forward Hypothesis 2: Autonomous motivation plays a mediating role in the relationship between perceived parental autonomy support and academic procrastination.

The Mediating Effect of Time Management Disposition

It can be seen from the definition that academic procrastination is a kind of behaviour that postpones learning tasks in the time dimension. In addition, from the perspective of time discounts, people tend to choose tasks that are immediately rewarding and tend to delay tasks that take longer to be rewarding.²⁶ From these results, it can be presumed that the awareness of time may be one of the keys to influencing procrastination. Time management disposition is an individual's performance in time management.

It includes not only an individual's cognitive characteristics, such as attitude, planning, and utilization of time, but also an individual's value and behavioural inclinations towards time. As a personality characteristic in time dimension, time management disposition includes three dimensions: the sense of time value, the sense of time control and the sense of time efficacy. *The sense of time value* is the dimension of the emotional level and is the basis of individual's time management. *The sense of time control* is an individual's concept and ability to use and manage time, which is reflected through a series of explicit activities, such as planning, setting goals, time allocation, and result checking and a series of monitoring activities. *The sense of time efficacy* is an individual's belief and expectation on the use and planning of time. It reflects the individual's confidence in time management and the estimation of time management behavioural ability. It is an important factor restricting time monitoring.²⁷ Previous studies have found that time management is a key aspect of self-regulated learning,²⁸ and a high level of time management disposition can negatively predict students' academic procrastination.²⁹ Additionally, SDT states that autonomous support can help students initiate, regulate, and organize their behaviours to achieve their academic goals.^{16,30,31} Therefore, it is reasonable to believe that perceived parental autonomy support can help individuals better manage time and reduce negative learning behaviours such as procrastination. Previous empirical studies have also supported this inference to a certain extent. For example, Won and Yu¹⁶ found that perceived parental autonomy support could positively predict academic time management and negatively predict procrastination. Chen et al³² showed that time management disposition played a mediating role between emotionally warm parenting styles and adolescent internet gaming disorders. Therefore, this study puts forward Hypothesis 3: Time management disposition plays a mediating role between perceived parental autonomy support and academic procrastination.

The Chain Mediating Effect of Autonomous Motivation and Time Management Disposition

Furthermore, there is also a close relationship between autonomous motivation and time management disposition. Students with strong autonomous motivation may have a deeper understanding of the value of time and are better at managing time spent on academic tasks, which has also been confirmed by previous studies.^{28,33} In addition, some studies have shown that locus of control could significantly predict students' time management disposition, which means those with an internal locus of control have higher level of time management disposition.^{34,35} Therefore, this study further proposes Hypothesis 4: Autonomous motivation and time management disposition play a chain mediating role between perceived parental autonomy support and academic procrastination.

In conclusion, to learn more about the influencing factors of middle school students' academic procrastination and its internal mechanism, this study constructed a chain mediation model within the framework of SDT. The specific hypothetical model diagram is shown in Figure 1.

Materials and Methods

Participants

In this study, 662 students (353 boys and 309 girls) from a junior high school in Jinan City, China, were recruited by convenience sampling. The average age of these participants was 12.66 ($SD = 0.67$), and the sample was composed of 335 seventh graders and 327 eighth graders. This research was approved by the ethics committee of Shandong Normal University.

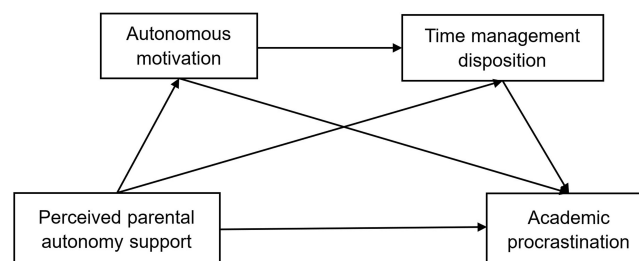


Figure 1 Hypothetical model diagram of the relationship between perceived parental autonomy support and academic procrastination.

Measures

This is a quantitative study, and a relational screening method was used to test the relationship between variables. Data were collected through a questionnaire survey. Four well-established scales were used to measure participants' degree on each variable.

Parental Autonomy Support Scale

This questionnaire was compiled by Wang et al³⁶. The scale includes 12 items, such as “whenever possible, my parents let me make my own choices.” Each item is measured on a 5-point Likert scale, from 1 (totally inconsistent) to 5 (totally consistent). Higher scores indicate that the individual perceives more parental autonomy support. In this study, the Cronbach's alpha is 0.91.

Academic Procrastination Inventory for Middle School Students

This questionnaire was compiled by Zuo³⁷ and contains four subscales: postponing planning, postponing executing, postponing remedying and postponing summarizing. In total, there are 17 items in this questionnaire, such as “I never think about how to organize my studies but do whatever comes to my mind.” Each item is measured on a 5-point Likert scale, from 1 (totally inconsistent) to 5 (totally consistent). A higher score indicates a higher level of academic procrastination for the individual. The scale has been shown to have good reliability and validity in previous studies.³⁸ In this study, the Cronbach's alpha for each subscale is 0.83, 0.73, 0.74, and 0.83, and the overall Cronbach's alpha is 0.92.

Academic Self-Regulation Questionnaire (SRQ-A)

This questionnaire was compiled by Ryan and Connell³⁹ and revised by Tang.⁴⁰ The scale consists of four subscales: external regulation, introjected regulation, identified regulation, and intrinsic motivation (including integrated regulation). In this study, the latter two subscales (ie, identified regulation and intrinsic motivation) are used to measure the subjects' autonomous motivation. The two scales each contain 7 items, for a total of 14 items. The questionnaire involves four questions, such as “Why do I do my homework?” Several responses are given after each question, such as “Because doing homework is fun.” Participants are asked to rate how well they fit each answer. Each item is rated using a 5-point scale ranging from 1 (totally inconsistent) to 5 (totally consistent). According to previous research, the average of the subjects' scores on the two subscales is their autonomous motivation score. A higher score indicates a higher level of autonomous motivation for the individual. In this study, the Cronbach's alpha for each subscale is 0.85 and 0.89, and the overall Cronbach's alpha is 0.91.

Adolescence Time Management Disposition Scale (ATMD)

This questionnaire was compiled by Huang and Zhang²⁷ and contains three subscales: the sense of time value, the sense of time control, and the sense of time efficacy. In total, there are 44 items in this questionnaire, such as “I usually organize my daily activities into a schedule.” Each item is measured on a 5-point Likert scale, from 1 (totally inconsistent) to 5 (totally consistent). A higher score indicates a higher level of time management for the individual. In this study, the Cronbach's alpha for each subscale is 0.82, 0.81 and 0.83, and the overall Cronbach's alpha is 0.91.

Data Analysis

In this study, SPSS 22.0 is used to input and organize the data and conduct reliability analysis and common method bias tests. Subsequently, descriptive statistics are performed on each variable, and Pearson product-moment correlation is used to examine the correlation between variables. Finally, the bias-corrected percentile bootstrap method (with 5000 samples, under the 95% confidence interval) is used to conduct hypothesis testing. The present study uses the SPSS PROCESS macro (model 6) compiled by Hayes⁴¹ to test the mediation effect of autonomous motivation and time management disposition. The statistical diagram of PROCESS model 6 is shown in Figure 2, where a_1 , a_2 , b_1 , b_2 , d_{21} , and c' are all unstandardized regression coefficients (B). To allow a direct comparison between the regression coefficients, this study decided to report the standardized regression coefficients (β) in the Results section.

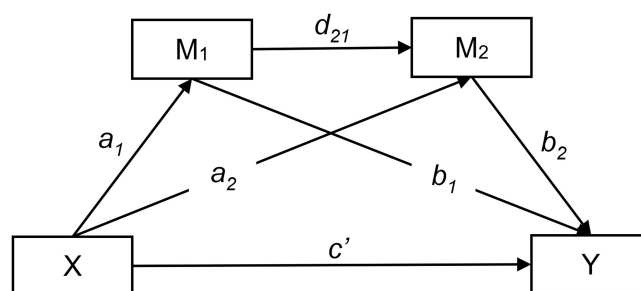


Figure 2 Statistical diagram of PROCESS model 6.

Notes: The mediating effect of $M_1 = a_1 \cdot b_1$. The mediating effect of $M_2 = a_2 \cdot b_2$. The chain mediating effect of M_1 and $M_2 = a_1 \cdot d_{21} \cdot b_2$. The direct effect of X on $Y = c'$. The total effect of X on $Y = a_1 \cdot b_1 + a_2 \cdot b_2 + a_1 \cdot d_{21} \cdot b_2 + c'$.

Results

Common Method Bias Test

Since the data of all variables in this study were from the self-reports of participants, there might exist common method bias, so a common method bias test was necessary. The Harman single-factor test was used to conduct exploratory factor analysis on all items. The results showed that there were 15 factors with eigenvalues greater than 1. The first factor accounted for 29.29% of the total variation, which was less than the critical standard of 40%, so it can be assumed that there was no serious common method bias in this study.

Descriptive Statistics and Correlation Analysis

The descriptive statistics and correlation matrix of each variable are shown in Table 1. As Table 1 shows, the skewness and kurtosis values of each variable were close to 0, indicating that the data can be considered normally distributed. Perceived parental autonomy support was positively correlated with autonomous motivation ($r = 0.34, p < 0.001$) and time management disposition ($r = 0.50, p < 0.001$) and negatively correlated with academic procrastination ($r = -0.43, p < 0.001$). Autonomous motivation was positively correlated with time management disposition ($r = 0.61, p < 0.001$) and negatively correlated with academic procrastination ($r = -0.52, p < 0.001$). Time management disposition was negatively correlated with academic procrastination ($r = -0.75, p < 0.001$).

Serial Mediation Analyses

The SPSS macro program PROCESS⁴¹ was used to conduct the mediation analysis. After controlling for gender and age, we used model 6 to test the chain mediation effect. As shown in Table 2, perceived parental autonomy support

Table 1 Descriptive Statistics and Correlations for the Main Variables

| | <i>M</i> ± <i>SD</i> | PPAS | AM | TMD | AP |
|----------|----------------------|----------|----------|----------|-------|
| PPAS | 3.62 ± 0.96 | I | | | |
| AM | 3.43 ± 0.99 | 0.34*** | I | | |
| TMD | 3.74 ± 0.67 | 0.50*** | 0.61*** | I | |
| AP | 2.24 ± 0.87 | -0.43*** | -0.52*** | -0.75*** | I |
| Gender | 0.53 ± 0.50 | 0.04 | 0.07 | 0.11** | -0.05 |
| Age | 12.66 ± 0.67 | 0.04 | -0.10* | -0.06 | 0.06 |
| Skewness | | -0.54 | -0.33 | -0.43 | 0.58 |
| Kurtosis | | -0.37 | -0.42 | 0.31 | -0.30 |

Notes: *N* = 662. For gender, 1 = male, 0 = female. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Abbreviations: PPAS, perceived parental autonomy support; AM, autonomous motivation; TMD, time management disposition; AP, academic procrastination. *M*, mean; *SD*, standard deviation.

Table 2 Regression Analysis of the Relationship Between Variables

| Regression Equation | | Overall Fit Index | | | Significance of Regression Coefficients | |
|---------------------|--------------------|-------------------|----------------|-----------|---|-----------|
| Outcome variable | Predictor variable | R | R ² | F | β | t |
| AP | Gender | 0.44 | 0.20 | 53.37*** | -0.04 | -1.08 |
| | Age | | | | 0.08 | 2.38* |
| | PPAS | | | | -0.44 | -12.43*** |
| AM | Gender | 0.36 | 0.13 | 32.62*** | 0.07 | 1.89 |
| | Age | | | | -0.11 | -3.15** |
| | PPAS | | | | 0.34 | 9.27*** |
| TMD | Gender | 0.69 | 0.47 | 147.59*** | 0.06 | 2.13* |
| | Age | | | | -0.03 | -1.14 |
| | PPAS | | | | 0.33 | 10.88*** |
| | AM | | | | 0.49 | 16.28*** |
| AP | Gender | 0.76 | 0.57 | 176.13*** | 0.03 | 1.18 |
| | Age | | | | 0.01 | 0.55 |
| | PPAS | | | | -0.08 | -2.69** |
| | AM | | | | -0.10 | -2.97** |
| | TMD | | | | -0.65 | -18.58*** |

Notes: N = 662. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Abbreviations: PPAS, perceived parental autonomy support; AM, autonomous motivation; TMD, time management disposition; AP, academic procrastination. R, multiple correlation coefficient; R², determinate coefficient; F, F-test; β , standardized coefficient; t, t-test.

significantly negatively predicted academic procrastination ($\beta = -0.44$, $t = -12.43$, $p < 0.001$). Perceived parental autonomy support also significantly positively predicted autonomous motivation ($\beta = 0.34$, $t = 9.27$, $p < 0.001$) and time management disposition ($\beta = 0.33$, $t = 10.88$, $p < 0.001$). Autonomous motivation significantly positively predicted time management disposition ($\beta = 0.49$, $t = 16.28$, $p < 0.001$). When all three major variables were entered into the regression equation at the same time, perceived parental autonomy support ($\beta = -0.08$, $t = -2.69$, $p < 0.01$), autonomous motivation ($\beta = -0.10$, $t = -2.97$, $p < 0.01$) and time management disposition ($\beta = -0.65$, $t = -18.58$, $p < 0.001$) could all negatively predict academic procrastination.

As shown in Table 3, the results showed that the 95% CI of the total indirect effect was significantly different from zero, which indicated that autonomous motivation and time management disposition had significant indirect effects on the relationship between perceived parental autonomy support and academic procrastination. This indirect effect

Table 3 Mediating Effect Analysis

| Route | Indirect Effect | Boot SE | Bootstrap 95% CI | Ratio of Indirect to Total Effect |
|----------------|-----------------|---------|------------------|-----------------------------------|
| Total | -0.32 | 0.03 | (-0.38, -0.26) | 81.77% |
| PPAS→AM→AP | -0.03 | 0.01 | (-0.05, -0.01) | 7.45% |
| PPAS→TMD→AP | -0.19 | 0.02 | (-0.24, -0.15) | 49.25% |
| PPAS→AM→TMD→AP | -0.10 | 0.01 | (-0.13, -0.07) | 25.04% |

Abbreviations: PPAS, perceived parental autonomy support; AM, autonomous motivation; TMD, time management disposition; AP, academic procrastination. Boot SE, estimated standard error through the bootstrap method; Bootstrap 95% CI, the 95% confidence interval through the bootstrap method.

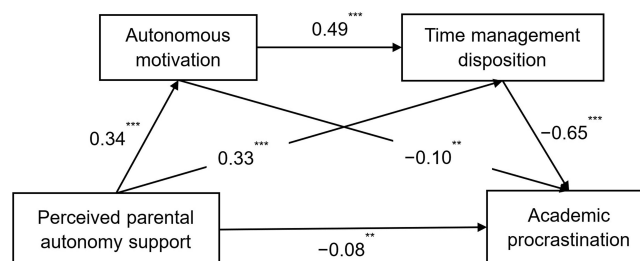


Figure 3 Paths for how perceived parental autonomy support predicts academic procrastination.

Notes: The numbers represent standardized regression coefficients (β). ** $p < 0.01$, *** $p < 0.001$.

consisted of three paths. The first mediating effect on perceived parental autonomy support that was measured was autonomous motivation on academic procrastination and the coefficient was -0.03 , accounting for 7.45% of the total effect, while the 95% CI was $[-0.05, -0.01]$. The second mediating effect on perceived parental autonomy support was time management disposition on academic procrastination, which had a coefficient of -0.19 , accounting for 49.25% of the total effect, while the 95% CI was $[-0.24, -0.15]$. The third mediating effect on perceived parental autonomy support was autonomous motivation on time management disposition and then on academic procrastination, which had a coefficient of -0.10 , accounting for 25.04% of the total effect, while the 95% CI was $[-0.13, -0.07]$. The above analysis results showed that the indirect effects of these three pathways were all significant; that is, the chain mediating model was established. The paths of perceived parental autonomy support predicting academic procrastination are shown in Figure 3.

Discussion

This study explored the impact of perceived parental autonomy support on academic procrastination and its specific mechanism in middle school students and established a chain mediation model. The results showed that perceived parental autonomy support could significantly negatively predict academic procrastination among middle school students, which is consistent with the research hypothesis (H1). SDT emphasizes that autonomy support from parents and teachers is an important factor affecting children's self-determination behaviour.¹² According to the degree of exploration and engagement, Marcia⁴² divides the ego identity of individuals into four states in which *identity achievement* refers to the condition in which the individual has already explored and actively engaged with his or her context. In a supportive environment, adolescents are better able to explore their studies and engage in academic work earlier, which may be one of the reasons why perceived parental autonomy support can directly affect academic procrastination.

In addition, this study also explored the mediating role of autonomous motivation and time management disposition between perceived parental autonomy support and academic procrastination. First, perceived parental autonomy support could predict academic procrastination by predicting autonomous motivation, which is consistent with the research hypothesis (H2). SDT emphasizes that individuals strive for autonomy to satisfy their own basic psychological needs.³⁰ At the same time, in the second leap in the development of self-awareness, adolescents' desire for independence becomes increasingly stronger. Therefore, during this period, if students perceive their parents' support for their autonomy, they will be able to convert the power of this support into autonomous motivation and thus promote positive academic behaviour.

Second, perceived parental autonomy support could also positively predict time management disposition, which in turn predicts academic procrastination. This result is consistent with the research hypothesis (H3). Huang and Zhang²⁷ believe that time management disposition is not only a product of an individual's cognitive characteristics (such as attitude, planning and utilization of time) but also an expression of an individual's values and behavioural tendencies towards time. It is a personality characteristic with a multidimensional and multilevel psychological structure. Thus, parental autonomy support may not only directly impact children's academic behaviour but also affect their learning behaviour by affecting children's cognition and shaping their values and personality. This suggests that the impact of parental autonomy support on academic procrastination may not be temporary but can affect study habits in the long

term. Therefore, both in the context of home education and school education, educators should pay attention to the impact of autonomy support on students and help students avoid chronic procrastination.

Finally, perceived parental autonomy support could also predict academic procrastination through the chain-mediated path of “perceived parental autonomy support → autonomous motivation → time management disposition → academic procrastination”, which is consistent with our hypothesis (H4). The results showed that there is also a relationship between autonomous motivation and time management disposition and that students’ internal drive is one of the important factors that can promote a better understanding and management of time. In addition, according to SDT, parents should focus not only on the cultivation of their children’s internal motivation but also on the transformation of external motivation to internal motivation. Parents can facilitate their children’s integration of learning skills with their ego, to ultimately help them develop better study habits and reach higher academic achievements.

Notably, although the three mediating pathways were all significant, the mediating effect of autonomous motivation accounted for only 7.45% of the total effect, while the mediating effect of time management disposition accounted for 49.25%, and the chain mediation effect accounted for 25.04%. This shows that the effect of time management disposition is the strongest, followed by the chain mediation effect, and then autonomous motivation, with the weakest effect. The reason for the relatively weak effect of autonomous motivation may be that the participants of this study were junior high school students. Although adolescents in this period were in the second leap of self-awareness development, because they were still early adolescents, they may not have had many opportunities for self-exploration and therefore may not have had strong autonomous motivation. Second, the mediating effect of time management disposition is strong, which suggests that we should primarily stress the cultivation of this mindset in adolescents as part of personality development. The effect of chain mediation is second only to the mediation effect of time management disposition, indicating that educators should not ignore the cultivation of autonomous motivation while attaching importance to time management disposition. As adolescents grow and their autonomous becomes stronger, the effect of autonomous motivation and its effect on time management disposition will gradually emerge.

Limitations and Future Directions

This study has the following limitations, which still need to be improved upon in future research. First, this study is a cross-sectional study, and the explanation of the causal relationship between variables is limited. In the future, a more detailed and in-depth discussion can be carried out through longitudinal research methods. Second, the data in this study were collected through the self-reporting of participants. In the future, more reporting methods should be used to collect more objective data. Finally, this study explored only the process and mechanism of the effect of perceived parental autonomy support on academic procrastination. In the future, researchers could further explore the moderating role of other independent factors in this process and provide a more powerful perspective for preventing and intervening in adolescent academic procrastination habits.

Conclusion

The results suggest that perceived parental autonomy support can negatively predict the level of academic procrastination among middle school students. In addition, perceived parental autonomy support can also predict academic procrastination through three indirect pathways: the mediating roles of autonomous motivation, time management disposition, and the chain effects of these same two variables. These three pathways account for 7.45%, 49.25%, and 25.04% of the total effect, respectively. The results of this study show that parents should pay attention to supporting their children’s autonomy. Educators should also pay attention to the cultivation of middle school students’ time management disposition, and they should not ignore the stimulation of students’ autonomous motivation. These are important for reducing and preventing academic procrastination in middle school students.

Data Sharing Statement

The datasets generated for this study are available on request to the corresponding author.

Ethics Statement

This study was conducted in accordance with the Declaration of Helsinki and was approved by the Institutional Review Board of Shandong Normal University.

Informed Consent

Participants were fully informed of the content and purpose of the survey before participating. Informed consent was obtained from all participants and their parents or legal guardians in this study.

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Disclosure

The authors would like to declare that we have no conflicts of interest for this work.

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