



RESEARCH ARTICLE

Educational Big Data Mining: Examining the Mediating Role of Family Relationship in the Impacts of Romantic Relationship on Education

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ARTICLE INFO**ABSTRACT**

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Young adults aged 18 and 26 years are bound to experience relationships such as romantic relationships (RR) and family relationships. However, there is a lack of research that shows whether the educational performance of young adults is influenced by the romantic relationships and family relationships they experience. This situation has caused concerns and a sense of urgency to ensure that the relationships experienced by young adults do not negatively impact their academic performance. Therefore, this study aims to investigate the impact of these relationships on the educational performance of young adults and to provide ways to improve their academic performance. The correlation between relationships and several demographic, relationship, romantic relationship, and education variables is analyzed using SPSS. This research is crucial as it helps to build predictive models of young adults' academic performance and the different types of relationships while ensuring their education quality to support their physical and mental well-being.

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1. INTRODUCTION

1.1 Background

Family and romantic relationships are key social factors that can influence the academic performance of young adults. Young adults' academic performance can be affected by the quality of their relationships with their family members and couples. The impact of these relationships on educational performance can be both positive and negative, and understanding the complex interplay between these social factors is crucial to developing effective interventions to promote academic success among young adults (Tin et al., 2023).

Research has shown that positive family relationships can have a significant impact on young adults' academic performance. A supportive family environment, including high levels of parental participation, emotional support, and academic encouragement, has been associated with higher academic achievement and better mental health outcomes (Crouter & McHale, 2018). On the contrary, negative family relationships, such as parental conflict or neglect, can lead to lower academic performance and increased mental health problems among young adults.

Similarly, romantic relationships can have both positive and negative effects on young adults' academic performance (Ting et al., 2024). Positive romantic relationships characterized by emotional support and motivation can lead to higher academic achievement and lower levels of stress and anxiety (Giordano et al., 2018). However, negative romantic relationships, such as those characterized by conflict or control, can lead to distractions, time management issues, and reduced academic performance (Carver et al., 2018).

In conclusion, the impact of family and romantic relationships on young adults' academic performance is complex and multifaceted. Positive relationships characterized by emotional support, motivation, and academic encouragement can improve academic performance, while negative relationships characterized by conflict, control, or peer pressure can lead to reduced academic performance and increased mental health problems. Understanding the interaction between these social factors is crucial to develop effective interventions to promote academic success among young adults.

1.2 Problem statement

Family relationships have a significant impact on the academic performance of students. The quality of the relationship between parents and children can influence students' academic motivation, self-esteem, and academic achievement. Therefore, understanding the impact of family relationships on educational performance is important in developing effective strategies to improve student academic outcomes.

Romantic relationships can have positive and negative effects on academic performance. Although being in a healthy romantic relationship can provide emotional support and motivation, it can also lead to distractions and time management issues. Understanding the impact of romantic relationships on academic performance is crucial for students to make informed decisions about their personal lives.

2.0 LITERATURE REVIEW

The impact of sex in relationships on academic performance has been widely studied in the field of education *Sociology of Education* (2008). A study by Jones et al. (2019) examined the relationship between sexual activity in romantic relationships and academic performance among college students. The results showed that those who reported engaging in sexual activity more frequently had a lower overall GPA than those who reported less frequent sexual activity. Parental neglect partially mediated the relationship between sex in relationships and academic performance, suggesting that parental neglect contributes to lower academic performance among sexually active students by Wang et al. (2021). Another study by Zhao et al. (2022) found that parental neglect has fully mediated the relationship between sex in romantic relationships and academic performance, indicating that parental neglect is an important factor to consider in understanding the relationships between sex in romantic relationships and academic performance.

As another mediator, Yang et al. (2018) found that Parent-Ordered Move Out mediated the relationship between sex and academic participation among Chinese high school students. As such, students who struggle academically are more likely to experience additional stress from family and social expectations. Moreover, students may develop mature connections with peers and, most importantly, love partners throughout this time as these interactions become vital in their daily life studied by Guarnieri et al. (2015). In addition to that, a warm and encouraging mother-child relationship was shown to buffer the association between romantic involvement and academic engagement among Taiwanese high school students in the research by Lin et al. (2021). Individuals who had a stronger mother-child bond were more likely to be involved in their academic interests, and this bond helped reduce the negative impacts of romantic relationships on academic engagement. Like the above, a study by Shin et al. (2018) indicated that the quality of the present mother-child relationship mediates the association between romantic involvement and academic achievement among Korean high school students. More specifically, even in the presence of romantic engagement, individuals who had better mother-child relationships were more likely to maintain high levels of academic performance.

Pregnancy in a relationship is a significant life event that will have a significant impact on the educational performance of the pregnant teenager. Teenagers who are pregnant will have an average of less educated for 1.8 years, in other words, mean 1 year and 9 months by Natalia Cantet (2019). Natalia Cantet (2019) conducted research and found that there is about 50% of chance of failing a course during education and a 10% chance of dropping out of school. Young adults' pregnancy will also cause them to have a lower academic achievement compared to the others, based on research carried out by Chin et al. (2018). Similarly, Holbein and Mendez (2018) also state that pregnant adolescents will have lower academic performance compared to those who are not pregnant. Teens who are pregnant will have a higher level of stress in the study and will have a low motivation in the Torres and Solberg (2019). According to the research of Leathers and Kelley (2018), teenagers who have an unplanned pregnancy will have a lower GPA and are hard to graduate compared to the other due to added responsibility of caring for a child. A study by Brown et al. (2021) found that mother-daughter activities were positively associated with academic achievement among pregnant and parenting teens. The Parent Even Order Moved Out is an important mediating role because it can affect romantic relationships and their academics. Aune and Norberg (2019) carried that that research and found out pregnant adolescents will have a negative impact on their academic performance if they experience their parents ordering them to move out. Broussard et al. (2021) found that pregnant adolescents will have housing instability after receiving an order to move out, and that this will cause their academic performance to worsen.

Academic achievement is an important part of human life because this will affect your future, whether successful or unsuccessful. This review of the literature finds research on how the sex of the partner and the warmth or love of a mother affect the academic performance of the student, which is their overall failure index on their examination. The warmth or love of the mother that a student is a mediator between the sex of the partner and academic performance. A study by Leung et al. (2020) shows that the quality of the mother-child relationship plays a mediating role between a romantic relationship and academic performance. They found that a supportive and warm mother can protect their child's academic performance from the harmful impact of a negative romantic relationship. Lillard and Willis (2017) conducted a study exploring the relationship between the sex of one's partner and academic performance. The study explored that boys have better academic performance when they have male teachers, while girls perform better with female teachers. Another study by Haleque and Rohner (2012) found that children who received high levels of warmth and love from their parents have a better academic result than those who received low levels of warmth and love. Hannon and colleagues (2019) conducted a study on the relationship between the sex of a partner and academic success. Hannon and colleagues discovered that male partners were more likely to negatively impact academic success than female partners. The study found that male partners were more likely to make it harder to do well in school because they may do things like use drugs or skip classes, which can negatively affect academic performance. On the contrary, female partners were more likely to provide emotional support and encouragement, which can positively affect academic success. A group of researchers led by Smith (2020) discovered that a mother's love and care can help lessen the harm caused by a male partner on academic performance. They found that male partners can make it harder to do well in school compared to female partners, but if the mother is supportive, the negative impact can be reduced. The study suggests that a loving mother can protect against the negative effects of having a male boyfriend on academic success. A study by Lee et al. (2019) found that parental neglect mediated the relationship between the sex of a partner and academic failure. The study found that having a partner of the opposite sex was associated with higher levels of parental neglect, which, in turn, was associated with lower academic achievement. A study by Chen et al. (2020) found that male students who were in relationships with female partners were more likely to experience academic probation when they had recently experienced a parent-even order moved out. This suggests that the negative impact of female partners on male students' academic performance may be partially mediated by the current Parent Even Order Moved Out.

Furthermore, a study conducted by Zhang and his colleagues (2019) investigated the relationship between romantic relationships and academic performance among Chinese college students. They had found that students who were in a romantic relationship had lower GPAs than those who were not in a relationship. However, this effect was not significant for the year 1 overall failure index. Next, another study conducted by Vanassche and her colleagues (2020) examined the effect of romantic relationships on academic performance among Flemish college students. They had found that being

in a romantic relationship was associated with lower grades in the first year of college. However, a recent study by Wang et al. (2021) had found that the relationship between romantic involvement and academic performance was not straightforward. They found that students in a romantic relationship had lower overall GPAs, but this effect will only be significant for female students. Male students in a romantic relationship did not really show a significant difference in the overall failure index year 1. Furthermore, another similar study conducted by Diamantopoulou et al. (2021) examined the impact of romantic relationships on academic performance among Greek university students. They found that students in romantic relationships had lower GPA than those students who were single. However, this effect was not very significant for the overall failure index year 1. Neglectful parenting can result in poor academic performance and negative mental health effects for children and adolescents. Some studies have also looked at how parenting practices can affect the relationship between romantic relationships and academic performance. For example, a study by Kim et al. (2019) found that when parents were more involved, the negative impact of romantic relationships on academic performance was reduced for Korean college students. In addition to that, one study conducted by Johnson and his colleagues (2018) has examined the impact of parental involvement on the relationship between romantic relationships and academic outcomes among college students. Researchers found that if parents had ever forced their child to leave home, being in a romantic relationship was more likely to lead to poor school performance. This suggests that parents who are involved could change how romantic relationships affect school performance. Lastly, another study by Kim and his colleagues (2019) examined how parental involvement and romantic relationships affect school performance in Korean college students. They found that when parents were more involved, they could help reduce the negative effects of romantic relationships on academic performance.

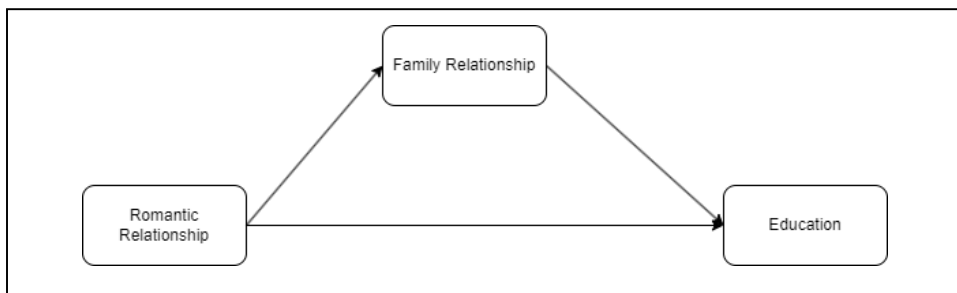
Conceptual framework

Based on the literature review in the previous sections, this study constructed a conceptual framework (Figure 1) with the following hypotheses.

- H1:** Romantic Relationship correlates positively with Education.
- H2:** Parent Often Neglected Children mediates the relationship between a Sex in Relationship and Overall Failure Index Year 1.
- H3:** Parent Even Ordered Move Out mediates the relationship between a Sex in Relationship and Overall Failure Index Year 1.
- H4:** Current Mother Warm or Loving to You mediates the relationship between a Sex in Relationship and Overall Failure Index Year 1.
- H5:** Enjoy Doing Thing With Current Mom mediates the relationship between a Pregnancy in Relationship and Overall Failure Index Year 1.
- H6:** Current Mother Warm Or Loving To You mediates the relationship between a Pregnancy in Relationship and Overall Failure Index Year 1.
- H7:** Parent Even Order Move Out mediates the relationship between a Pregnancy in Relationship and Overall Failure Index Year 1.
- H8:** Current Mother Warm or Loving You mediates the relationship between a Sex of Partner and Overall Failure Index Year 1.
- H9:** Parent Even Order Moved Out mediates the relationship between a Sex of Partner and Overall Failure Index Year 1.
- H10:** Parent often neglected children mediates the relationship between a Sex of Partner and Overall Failure Index Year 1.
- H11:** Parent Ever Order Move Out mediates the relationship between a Is It a Romantic Relationship and Overall Failure Index Year 1.
- H12:** Current Mother Warm or Loving to You mediates the relationship between a Is It a Romantic Relationship and Overall Failure Index Year 1.

H13: Parent Often Neglected Children mediates the relationship between a Is It a Romantic Relationship and Overall Failure Index Year 1.

H14: Family Relationship mediates the relationship between Romantic Relationship and Education.



Note:

Romantic relationship: Pregnancy in relationship, sex of partner, a romantic relationship, sex in relationship

Education: Overall Failure Index Year 1

Figure 1; Conceptual framework of this study.

3.0 METHODOLOGY

ICPSR

One of the top international associations of the company, which is the Interuniversity Consortium for Political and Social Research (ICPSR), provides more than 250000 files of datasets related to social sciences research. Researchers can download and use public samples for free to study the vior and social sciences after cleaning, organizing, and analyzing the data (ICPSR, 2022). This study uses information from a large research project that looked at how young people grow up and become adults over many years, from 1994 to 2018. It is called the National Longitudinal Study of Adolescent to Adult Health, and it is a dataset that researchers can use to learn more about how people change as they age. The researchers conducted a survey of 90,000 students in grades 7-12 during Wave I, which took place in schools during 1994-1995. Later, during Wave II in 1996, they interviewed 15,000 of those students at their homes. During Wave III, the researchers continued their study by going to the homes of 15,170 young adults aged 18-26 and their partners (if they had one), who were originally part of Wave I. This took place during 2001-2002. The researchers conducted the final two rounds of the interviews at the homes of participants during Wave IV in 2008-2009 and Wave V in 2016-2018. These two rounds, together with the previous ones, make up a total of 42 sets of data for the entire study. The data set is cleansed and transformed using processes as shown in Figure 2. After data cleansing and transformation, the variables used in the research study are shown in Table 1.

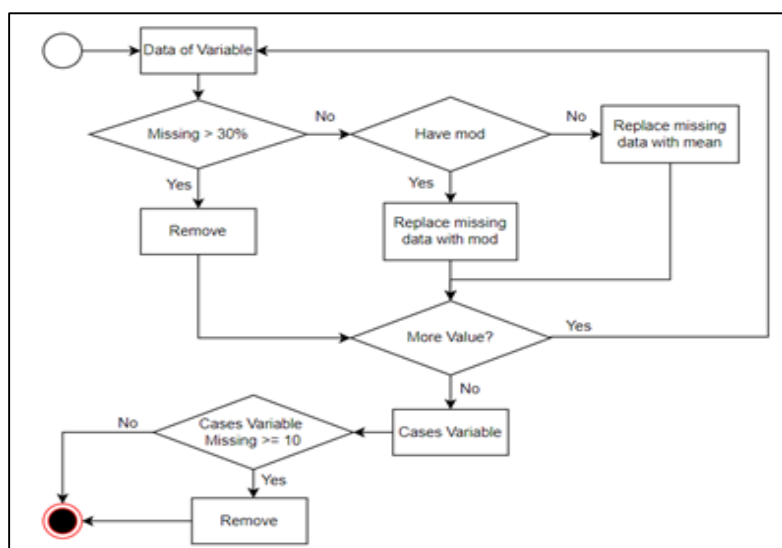


Figure 2: Data set cleaning and transformation process.

Table 1: Detail questionnaire items and scale used in the research study.

Variable ID	Variable	Question	Scale
H3RD3	A romantic relationship?	Do you and <Partner> have a romantic relationship?	(0) No; (1) Yes
H3HR26	parent ever ordered move out	Have your parents ever ordered you to move out of their house? [If Q.2>1, ask:] Did your parents ever order you to move out of their house?	(0) No; (1) Yes; (2) Never live with the parent.
H3TR9	Pregnancy in a relationship?	Please indicate whether your relationship with {Initials} included a pregnancy.	(0) No; (1) Yes
H3WP18	enjoy doing things w/curr mom	You enjoy doing things with <CRMOMTXT>. CURRENT RESIDENTIAL MOTHER	(0) Strongly Agree; (1) Agree; (2) Neither agree nor disagree; (3) Disagree; (4) Strongly disagree
H3TR8	Sex in relationship?	Have you had sexual relations with {Initials}? By "sexual relations" we mean vaginal intercourse (a man inserts his penis into a woman's vagina), oral sex (a person puts his or her mouth on another person's sex organs), or anal sex (a man inserts his penis into his partner's anus or asshole).	(0) No, we haven't had sexual relations; (1) Yes, we have had sexual relations
H3MAC8	often neglected children	How often have you not taken care of your {Child/Children}'s basic needs, such as keeping {Him/Her/Them} clean or providing food or clothing?	(0) This has never happened; (1) One time; (2) Two time; (3) 3-5 times; (4) 6-10 times; (5) More than 10 times
H3TR3	sex of partner	Please indicate whether {Initials} is male or female.	(0) Male; (1) Female
H3WP19	curr mom-war/loving to you	Most of the time, {He/She} is warm and loving toward you. Current Residential Mother.	(0) Strongly Agree (1) Agree (2) Neither agree nor disagree (3) Disagree (4) Strongly disagree
EAOFIX1	Overall failure index year 1	Proportion of all courses that students failed in each year (EAOFIX1-6) and cumulatively (EAOFIXC).	

Mediation analysis

Mediation analysis is a method used to examine the relationship between two variables by exploring the mediating effect of the third variable. It involves analyzing the relationship between independent variables (X), mediator variable (M), and dependent variable (Y). Mediation analysis is a widely used technique in various fields.

4. RESULTS AND DISCUSSION

Based on the correlation of Table 2, since all the Sigs for H1 which Romantic relationship correlates positively with education are $p < 0.05$, therefore H1 is accepted. Next, for H2, often neglected parents mediate the relationship between a sex in Relationship and Overall Failure Index Year 1 is positively correlated because the Sigs for both are $p < 0.05$. So, H2 is accepted. For H3, Parent Even Ordered Move Out mediates the relationship between a Sex in relationship and Overall Failure Index Year 1 is

correlated because the Sigs for both are $p < 0.05$. So, H3 is accepted. Furthermore, for H4, the current Mother Warm or Loving to You mediates the relationship between a Sex in Relationship and the overall failure index Year 1 is negatively negatively negatively negatively correlated because the Sigs for Current Mother Warm or Loving to You and Sex in Relationship is $p > 0.05$. So, H4 is not accepted. For H5, Enjoy Doing Thing with Current Mom mediates the relationship between a pregnancy in Relationship and Overall Failure Index Year 1 is negatively correlated because the Sigs for Enjoy Doing Thing With Current Mom and Pregnancy in Relationship is $p > 0.05$. So, H5 is not accepted. Other than that, for H6, Current Mother Warm or Loving To You mediates the relationship between a Pregnancy in relationship and Overall Failure Index Year 1 is negatively correlated negatively because the Sigs for Current Mother Warm Or Loving To You and Pregnancy in Relationship is $p > 0.05$. So, H6 is not accepted. For H7, the Parent Even Order Move Out mediates the relationship between a pregnancy in Relationship and Overall Failure Index Year 1 is positively correlated positively because the Sigs for both are $p < 0.05$. So, H7 is accepted. Furthermore, for H8, the current Mother Warm or Loving You mediates the relationship between a Sex of Partner and the Overall Failure Index Year 1 is negatively correlated negatively because the Sigs for Current Mother Warm Or Loving To You and Sex of Partner is $p > 0.05$. So, H8 is not accepted. For H9, Parent Even Order Moved Out mediates the relationship between a Sex of Partner and Overall Failure Index Year 1 is correlated because the Sigs for Parent Even Order Moved Out and Sex of Partner is $p > 0.05$. So, H9 is not accepted. In addition to that, for H10, often neglected children mediates the relationship between a Sex of Partner and Overall Failure Index Year 1 is negatively correlated negatively because the Sigs for Parent Even Order Moved Out and Sex of Partner is $p > 0.05$. So, H10 is not accepted. For H11, Parent Ever Order Move Out mediates the relationship between an Is It a Romantic Relationship and the overall failure index Year 1 is correlated negatively because the Sigs for Parent Even Order Moved Out and Sex of Partner is $p > 0.05$. So, H11 is not accepted. For H12, the Warm or Loving to You mediates the relationship between a Romantic Relationship and Overall Failure Index Year 1 is correlated because the Sigs for Current Mother Warm or Loving to You and Sex of Partner is $p > 0.05$. So, H12 is not accepted. Lastly, for H13, Parent Often Neglected Children mediates the relationship between a Is It a Romantic Relationship and Overall Failure Index Year 1 is correlated negatively because the Sigs for Parent Often Neglected Children and Sex of Partner is $p > 0.05$. So, H13 is not accepted.

Table 2: Correlations between variables.

	1	2	3	4	5	6	7	8
1	-							
2	-.040*	-						
3	-.032	-.019	-					
4	-.183**	.177**	-.093**					
5	-.016	.054**	.020	.070**				
6	-.019	-.021	.008	-.014	.101**			
7	-.016	.037*	-.028	.182**	.020	-.015		
8	-.035*	-.011	.102**	-.029	.092**	.712**	-.037*	
9	.041*	.076**	.099**	.157**	.119**	.053**	.055**	.052**

Note: N = 3269, * The correlation is significant at the 0.05 level (2-tailed); ** The correlation is significant at the 0.01 level (2-tailed). Variable 1.Romantic relationship; 2.Sex in relationship; 3.Sex of partner; 4.Pregnancy in relationship; 5.Parents ever ordered move out; 6.Current mom warm/loving to you; 7.Often neglected children; 8. Enjoy doing things with current mom; 9.Overall failure index year 1.

According to Table 3, family relationships mediate all the independent variables related to the romantic relationship and education. Therefore, H14 is accepted.

Table 3: Mediation analysis results.

Independent Variable	Mediator	Dependent Variable	Direct Effect	Indirect Effect
Sex in Relationship	often neglected children	Overall failure index year 1	0.0371	0.0010(0.0001, 0.0021)

Sex in Relationship	parent ever ordered move out	Overall failure index year 1	0.0349	0.0031(0.0010, 0.0013)
Sex in Relationship	current mom-war/loving to you	Overall failure index year 1	0.0386	-0.0006(0.0006, -0.0020)
Pregnancy in relationship	Enjoy Doing Thing with Current Mom	Overall failure index year 1	0.0658	-0.0007(-0.0019, 0.0002)
Pregnancy in relationship	current mom-war/loving to you	Overall failure index year 1	0.0654	-0.0003(-0.0014, 0.0006)
Pregnancy in relationship	parent ever ordered move out	Overall failure index year 1	0.0619	0.0031(-0.0012, 0.0057)
Sex of Partner	current mom-war/loving to you	Overall failure index year 1	0.0327	0.0001(-0.0005, 0.0009)
Sex of Partner	parent ever ordered move out	Overall failure index year 1	0.0321	0.0008(-0.0005, 0.0023)
Sex of Partner	often neglected children	Overall failure index year 1	0.0334	-0.0005(-0.0016, 0.0001)
A romantic relationship?	parent ever ordered move out	Overall failure index year 1	0.0155	-0.0007(-0.0023, 0.0008)
A romantic relationship?	often neglected children	Overall failure index year 1	0.0152	-0.0004(-0.0013, 0.0003)
A romantic relationship?	current mom-war/loving to you	Overall failure index year 1	0.0152	-0.0003(-0.0012, 0.0004)

5. CONCLUSIONS

Based on research and the information that our group had used, family relationships can act as a mediator between romantic relationships and educational results. Positive family relationships can mitigate the negative impact of conflicts and negative experiences in romantic relationships on educational outcomes. For example, a study by Yudron and Foshee (2019) had found that adolescents who reported positive family relationships were less likely to experience negative outcomes in their romantic relationships, leading to better educational results. Similarly, Chen et al. (2021) discovered that college students with positive family relationships experienced less academic stress and had better academic performance, even in the face of conflicts in their romantic relationships. In contrast, negative family relationships can exacerbate the negative impact of conflicts and negative experiences in romantic relationships on educational outcomes. Another study by Alotaibi and Kinnunen (2018) found that college students with negative family relationships and conflicts in their romantic relationships were more likely to experience negative academic outcomes. Furthermore, Lambe and Craig (2020) had found that negative family relationships were associated with negative results in romantic relationships, which in turn led to lower educational outcomes. Therefore, individuals should not only manage their romantic relationships in a healthy and supportive manner, but also prioritize cultivating positive family relationships that can support their educational goals. This may involve seeking help and support from counselors or therapists when conflicts arise, as well as prioritizing communication and emotional support in both romantic and family relationships.

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