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The relationships between individual and school factors with academic performance: The mediating role of academic engagement and academic resilience

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Abstract---The aim of study was to investigate the relationship between individual and school factors with academic performance with the mediating role of academic engagement and academic resilience. From the population of Iraqi high school students, a sample of 300 students was randomly selected in 2021-2021. The data were collected using standard tools and analyzed by structural equation method in Amos. The results of the research indicated the compatibility of the theoretical model with the data fit. Also, the results showed that the individual factors had a significant direct effect on academic progress, academic engagement and academic resilience, in addition, the school factor had an effective role on academic resilience, academic engagement and academic performance of students, but the mediating effect of resilience and enthusiasm on academic performance was not significant. It is suggested to pay attention to individual and school factors to improve students' academic performance.

Keywords---individual factors, school factors, academic resilience, academic engagement, academic performance.

Introduction

In the development of any nation, students are considered as future assets because they act as potential human resources to replace the old people in the next generation. To achieve this, it is important to ensure that these young people are not only retained, but also acquire the necessary skills through training and enhance their talent (Singh et al, 2016). For this purpose, it is very important to pay attention to the quality of education, especially academic performance. Academic performance of students is considered a key feature in education and as the center around which the entire education system revolves (Abaidoo, 2018, Kumar et al, 202), and it is considered as an essential tool to reach a better future and is one of the important factors in predicting career and social success throughout life (So & Park, 2016).

Academic performance is a measure of student progress in various academic subjects, which is measured using classroom performance, graduation rates, and standardized test results (Briones et al, 2021). Examining academic performance as one of the indicators for evaluating students' learning and quality of education is one of the controversial issues in educational research due to its relevance and complexity, and has received special attention in recent decades (Lamas, 2015). Despite excessive government investment in education, most students fail to achieve good academic performance at all levels of education. This leads to unemployment, poverty, drugs, homelessness, illegal activities, social isolation, inadequate health insurance, low self-esteem, self-perception of failure, and ultimately, student dropout (Talib & Sansgiry, 2012, Chohan,2018, Tadese et al, 2022).

Extensive studies show that academic performance is affected by many motivational, cognitive, personality, and environmental factors (Marengo et al, 2019). However, insufficient research has been conducted on the mechanisms that explain this association (Topor et al, 2010), and the research findings are different among countries, different levels of education, and the subjects involved (Abaidoo, 2018, 2021). Researchers have tried to determine which variables positively and negatively affect student performance (Uyar & Güngörmüş, 2011). One of the influencing factors on academic performance is personality factors (Stajkovic et al, 2018). Personality differences among learners have an effect on the level of education (Weber & Ruch, 2012). Psychologists believe in that personality probably creates limits and boundaries for the type of learning, and these limits may adapt to environmental conditions and demands (Bergold, & Steinmayr, 2018). Personality is a set of emotional and behavioral traits that surround and accompany a person in his daily life. In other words, personality is a continuous characteristic through which a person regulates his interaction and adaptation with others and the social environment (Roberts & Yoon, 2022).

The research results in examining the relationship between personality factors and academic performance are heterogeneous. For example, John et al (2020)

showed that openness to experience had the most positive relationship with academic performance, followed by agreeableness and conscientiousness, however, neuroticism and extroversion had no significant relationship with education. Tomsik (2018) reported that only conscientiousness has a positive relationship with academic performance average. But some personality traits, such as openness to experience and agreeableness, have no effect on academic performance in adolescence. Of course, in the meantime, some studies also stated that the relationship between personality and performance can be different in educational fields (Vedel, 2014). The findings of previous studies, in addition to the role of personality factors, have reported a combination of environmental factors, including school, effective in students' performance (Narad & Abdullah, 2016).

One of the factors that influencing the performance of school students is the prevailing cultural atmosphere (Wong & Holcombe, 2010). School culture is in fact the values, beliefs and norms that govern the school environment. The culture of each school is its own and unique and sets it apart from other schools (Makewa et al, 2011). If everyday events are in that school, it affects the performance of all members of the school, but it is not a fixed thing, in addition to affecting behaviors, interests, attitudes, and norms, it also affects them. In a way, school culture is a cycle that both influences and is influenced (Espinoza-Herold & González-Carriedo, 2017). The role of schools in student performance is undeniable. Norms, values and traditions of the past and, consequently, school culture is a factor in increasing achievement. Good school culture can have a positive impact on students' learning or, conversely, if it is toxic and bad, it hinders performance (Baruch et al, 2004; Wong & Holcombe, 2010).

According to Kytle and Bogotch (2000), Real and sustainable change in school performance, thinking and feelings of school members are easily achieved by changing school culture (MacNeil, Prater & Busch, 2009). In general, everything in the school is influenced by its culture and characteristics, and schools need to emphasize the values and beliefs of the school and the environment outside the school in order to progress (Taslimi et al, 2018). Because school culture is also influenced by the community in which it is located, school culture is also a linking factor in which teachers, parents, and principals have a harmonious view of the ways, traditions, goals, and objectives of their school and community (MacNeil et al, 2009). As much as participation is emphasized in the school culture and the relationship between teachers and students and students with each other should be friendly. Students develop a positive feeling towards school and study, and this improves interest and academic engagement (Fredricks, Reschly & Christenson, 2019).

Academic engagement is one of the positive psychological characteristics that play a decisive role in students' education, which can effectively predict students' current academic performance (Hershberger & Jones, 2018), and also affect their future functional growth (Fredricks et al., 2016). Academic enthusiasm is a psychological state combined with concentration or engagement, which is a positive and satisfying state of mind related to learning (Ouweneel et al, 2014). According to Jimerson et al (2003), school engagement shows three-dimensional characteristics such as cognitive, behavioral and emotional. The emotional

dimension expresses the student's feelings towards the school, teachers and peers, the cognitive dimension expresses the student's beliefs and perceptions towards the school, students and the peer group, while the behavioral dimension includes the student's participation in activities, behaviors and performance observation (Erdođdu, 2019).

The research findings showed that high academic engagement leads to academic achievement (Johnson and Sinatra, 2013), improves physical and mental health (Wefald and Downey, 2009), It increases the ability to adjust to school (Wang and Fredricks, 2014), and reduces student dropout (Fan & Williams, 2010). Conversely, low academic engagement among adolescents can lead to academic failure, dropout, drug abuse, juvenile delinquency, and increased negative emotions such as anxiety and depression (Leslie et al., 2010; Li and Lerner, 2011). Another positive characteristic that is related to the academic performance of students is resilience (de la Fuente et al, 2017). Resilience is the ability or process of successful adaptation to threatening conditions and plays an important role in academic performance (Choo & Prihadi, 2019). Resilience is defined as the ability to recover from adversity or how a person copes with adversity (van Breda, & Theron, 2018), and it is considered as a way to manage stress, live in an efficient way, and participate in learning despite mental pressures (Lin et al, 2019). Resilient students have a positive self-evaluation of their academic situation and show a sense of control over school performance (Gutman & Schoon, (2013), even when they face academic problems, they grow and flourish academically (Mirza & Arif, 2018). Compared sidewise, individuals of higher academic resilience would more likely bounce back and adjust from academic adversities than individuals of lower academic resilience (Choo & Prihadi, 2019). The research of Cutmore et al (2018) indicated that the interaction of academic enthusiasm and resilience can guide psycho-educational performance with the aim of better supporting the educational growth of students.

Although academic performance has been consistently considered as an important consequence of students' engagement and resilience. there is extensive empirical research on the relationship between the two, results so far have been inconsistent, and research on the mechanism of impact of academic engagement is sparse (Lei et al, 2018). Therefore, it is necessary to investigate the impact of psychological factors regulating or intervening in the academic performance of adolescents (Erdođdu, 2019). Although personality and school factors influence adolescent academic performance, this influence varies from individual to individual, and little research has been conducted on the relationship between individual characteristics and resilience and academic engagement (Leppin et al, 2014; Lee & Lee, 2021). It has been confirmed that personality and school factors influence academic performance, but there is no research to confirm the contribution of these two factors or their combined effect through resilience and academic engagement. It is expected that resilience and academic engagement play a mediating role in the relationship between personality and school factors on academic performance. Therefore, this study was aimed to determine whether academic engagement and academic resilience play a mediating role in the relationship between personality and school factors with academic performance.

Materials and Methods

This research was based on the descriptive data collection method and according to the research design, it was correlational. A sample of 300 male and female students was randomly selected from the statistical population of high school students in Babil province of Iraq in 2021-2022. The statistical methods used in this research are divided into two parts: descriptive data and inferential analysis. SPSS24 was used to check assumptions and correlation of variables and Amos software was used to model structural equations.

Data Collection Tools

Goldberg 50-item Personality Questionnaire: Goldberg (1999) proposed four personality questionnaires in order to construct short personality questionnaires, based on his analysis of a total of 1252 items as well as the items of existing personality questionnaires. There are 10 positive and negative items to evaluate each of the 5 major personality factors, which are scored on a Likert scale. After studying each item, the subject rates its accuracy on a five-point scale from completely true (with a score of 5) to completely false (with a score of 1). Based on the results of the Khormaei's study (2006), the researchers selected the items of the Goldberg (1999) Big Five Personality Factors questionnaire and prepared a shorter form of this questionnaire, including 25 items. The *neuroticism* factor is measured by terms such as "I get upset easily", "I get angry quickly" and "I often feel sad". Statements such as "others are insignificant to me" and "I do not care about other people's problems" were used to measure the *Agreeableness* factor. The *Conscientiousness* factor is measured by terms such as "I leave my things here and there" and "I neglect my work". Examples of *extraversion* terms are "I usually start the conversation first" and "I'm comfortable with others." Statements such as "I have many ideas in mind" and "It is difficult for me to understand mental and abstract concepts" were also used to measure the factor of *openness* to experience. To determine the validity of the questionnaire of five major personality factors (short form), factor analysis was used using the principal component method with varimax rotation. In the analysis of the questionnaire data, the values of sampling adequacy index 1 and Bartlett sphericity test 2 (correlation matrix adequacy index) indicate the existence of sufficient evidence to perform factor analysis. The value of sampling adequacy index was 0.79 and the chi-square value of Bartlett test was 3.532, which was significant at the level of $P < 0.01$. Scree chart 3 was used to determine the amount of factors. Thus, due to the slope of the diagram, the factors revealed in the steep slope of the diagram were considered as the main factors and the acceptance of the factors that were parallel to the axis of the steep slope line was avoided. Then, Varimax rotation method was used to determine the factor loading of each item on each factor while maintaining the factor loadings of more than 0.30. The results of the analysis of the factors of independence confirmed the five major factors. Cronbach's alpha coefficient was used to determine the reliability of the questionnaire. Alpha coefficient was calculated to be 0.83 for the psychoanalytic factor. The alpha coefficients for compatibility were 0.83, conscientiousness was 0.81, and finally the alpha coefficients for extraversion and openness in experience were calculated to be 0.72 and 0.69, respectively.

Student Engagement Instrument (Appleton et al., 2006): Student engagement instrument (SEI) tool was developed to measure the academic engagement of high school students in the United States. It has two dimensions, cognitive and psychological, and has a total of six subscales of teacher-student relationship. Items 1 to 9 are related to homework control, questions 10 to 18 are low support for learning, questions 19 to 24 are related to the goals subscale and Future aspirations, questions 25 to 29 family support are related to learning, questions 30 to 35 are related to external motivation. This questionnaire is graded on a 5-point Likert scale (strongly agree -1 to strongly disagree -5) and questions 34 and 35 are scored in reverse. Appleton et al. (2006) for each subscale. Teacher-student relationships, control over school assignments, low support for learning, future goals and aspirations, family support for learning and external motivation reported Cronbach's alpha respectively (0.88, 0.80, 0.82, 0.78, 0.76 and 0.72) Appleton et al. (2006) in examining the validity of the instrument using factor analysis revealed that the questions are in good agreement with the components of academic conflict and this instrument has a good fit in measuring academic conflict.

Academic Resilience Scale (ARS-30): This questionnaire was prepared by Samuels in 2004 as the subject of his doctoral dissertation. In two studies, its suitability was confirmed and its final version was published in collaboration with Wu (2009). This questionnaire examines the three components of communication skills, future orientation, problem-oriented and positivity (Sultannejad et al. 2014). It is scored on a five-point scale from strongly disagree 1 to strongly agree 5. The scores a person gets are between 29 and 145. A high score indicates high academic resilience and a low score indicates low academic resilience (Tarvirdizadeh et al. 2017). Cronbach's alpha coefficients in its subscales in student samples between 0.63 to 0.77 and in student samples between 0.62 to 0.76 have been obtained that the reliability of three factors is acceptable (Sultannejad et al. 2014 .)

School Culture Questionnaire: Alessandro and Sadh School Culture Questionnaire (1997) consists of 25 items that measure four dimensions of student's relationships (4 items), students and teachers' relationships (6 items), educational opportunities (8 items), and normative expectations (7 items), and is based on the Likert 5-odd scale, ranging from *I totally disagree* "1" to the *totally agreeable* "5", and has a minimum score of 25 and a maximum of 125. Cronbach's alpha coefficient for students' relationships was 0.78, students 'and teachers' relationships 0.83, educational opportunities 0.81, normative expectations 0.81 and total score 0.94 to determine the validity of the questionnaires, face validity method was used and approved by experts in this field. Medium and above 3.75 were categorized as strong.

Academic Performance Rating Scale (APRS): The scale is a 19-item scale that was developed to reflect teachers' perceptions of children's academic performance and abilities in classroom settings. 33 items were initially generated based on suggestions provided by several classroom teachers, school psychologists, and clinical child psychologists. Of the original 30 items, 19 were retained based on feedback from a separate group of classroom teachers, principals, and school and child psychologists, regarding item content validity, clarity, and importance. The

final version included items directed towards work performance in various subject areas (e.g., “Estimate the percentage of written math work completed relative to classmates”), academic success (e.g., “What is the quality of this child’s reading skills?”), behavioral control in academic situations (e.g., “How often does the child begin written work prior to understanding the directions?”), and attention to assignments (e.g., “How often is the child able to pay attention without you prompting him/her?”). Two additional items were included to assess the frequency of staring episodes and social withdrawal. Although the latter are only tangentially related to the aforementioned constructs, they were included because “overfocused” attention (Kinsbourne & Swanson, 1979) and reduced social responding (Whalen, Henker, & Granger, 1989) are emergent symptoms associated with psychostimulant treatment. Teachers answered each item using a 1 « never or poor » to 5 « very often or excellent » Likert scale format. Seven APRS items (i.e., nos. 12,13,15- 19) were reverse keyed in scoring so that a higher total score corresponded with a positive academic status.

Results

Table 1 shows the mean, standard deviation and correlation between the variables.

Table1. Descriptive Statistics and Correlation Coefficients

variable	M	SD	(1)	(2)	(3)	(4)	(5)
Individual factor	3.89	0.68	1.000				
Academic engagement	3.69	0.66	0.363**	1.000			
Academic resilience	3.41	0.81	0.305**	0.251**	1.000		
School factor	3.63	0.64	0.151*	0.168**	0.296**	1.000	
Academic performance	3.82	0.74	0.334**	0.231**	0.233**	0.216**	1.000

As observed in Table 1, individual factor positively and significantly correlated with academic engagement ($r= 0.36$, $p<0.01$) and academic resilience ($r=0.30$, $p<0.01$). In addition, academic engagement was positively and significantly correlated with academic resilience ($r=0.251$, $p<0.01$). The relationship between individual factor and school factor was positive ($r=0.15$, $p<0.05$), the relationship between school factor and academic engagement ($r=0.168$) and with academic resilience ($r=0.296$), which was a positive relationship in both cases and significant at the 0.01 level. Academic performance was positively and significantly correlated with individual factor ($r=0.334$, $p<0.01$), academic engagement ($r=0.231$, $p<0.01$), academic resilience ($r=0.233$), and school factor ($r=0.216$, $p<0.01$).

Table 2. The Values of the Fit Indexes Taken as References and the Values Representing the Theoretical Model

Fit Indexes	Perfect Correspondence Criteria	Acceptable Correspondence Criteria	Model’s Fit Indexes	Result
χ^2/sd	$0 \leq \chi^2/sd \leq 2$	$2 \leq \chi^2/sd \leq 3$	1,312	Perfect Correspondence
RMSEA	$.00 \leq RMSEA \leq .05$	$.05 \leq RMSEA \leq .08$,032	Perfect Correspondence

CFI	$.95 \leq CFI \leq 1.00$	$.90 \leq CFI \leq .95$,965	Perfect Correspondence
GFI	$.95 \leq GFI \leq 1.00$	$.90 \leq GFI \leq .95$,932	Acceptable Correspondence
AGFI	$.95 \leq AGFI \leq 1.00$	$.85 \leq AGFI \leq .90$,913	Acceptable Correspondence
IFI	$.95 \leq IFI \leq 1.00$	$.90 \leq IFI \leq .95$,966	Perfect Correspondence

*(Celik& Yilmaz, 2013; Cokluk, Sekercioglu, &Buyukozturk, 2014)

As seen in Table 2, RMSEA being below 0.05, CFI is higher than 0.95, IFI is higher than 0.95 that shows the perfect fit of the model with the data set. The AGFI is less than 0.95 and GFI is higher than 0.90 that also found out to be at acceptable levels. This indicates that the tested model fits well with the data set. According to the results reported in Table 1 and 2, there was sufficient correlation assumption between the variables and model fits well with the data to carry out SEM, as a result, SEM can be used for analysis.

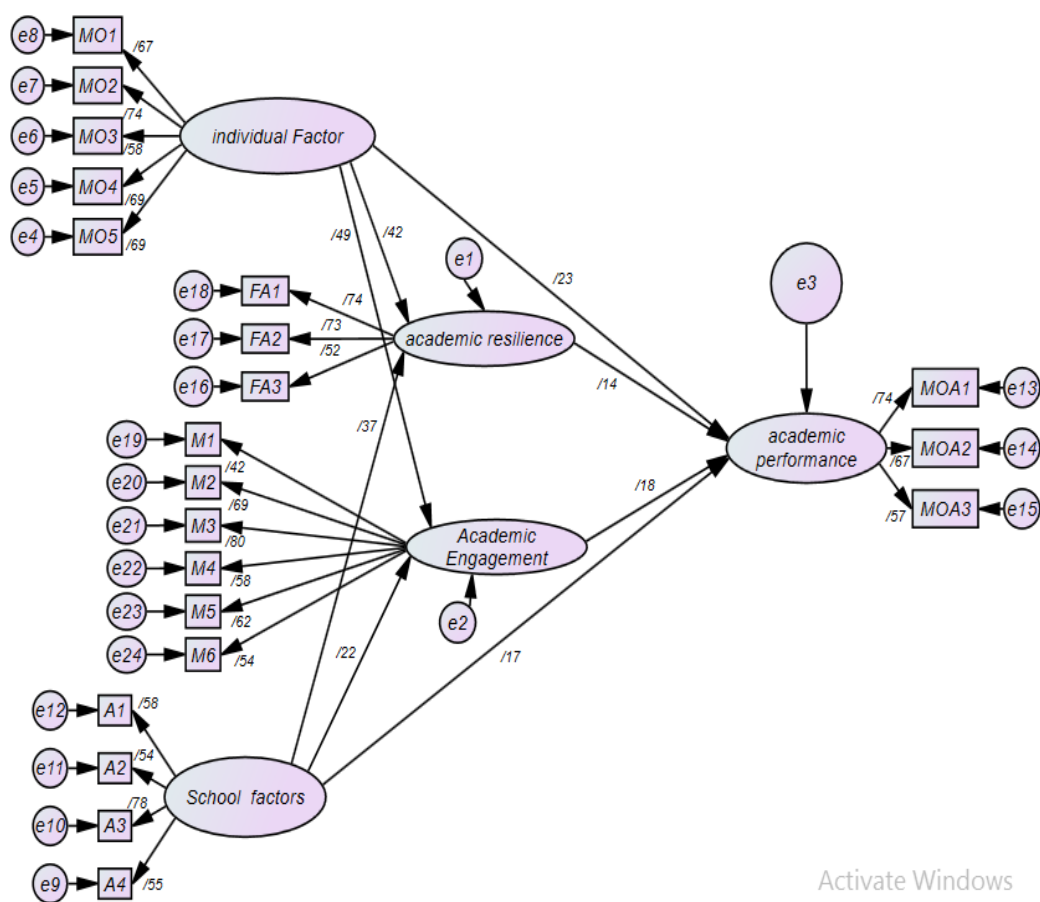


Figure 1. Standard Coefficients of Structural Equation Model

Table3.Structural equation to test the significance of hypotheses

			Estimate	S.E.	C.R.	P	Label
Academic Engagement	<---	Individual Factor	/288	/057	5/028	***	
Academic resilience	<---	Individual Factor	/366	/075	4/883	***	
Academic Engagement	<---	School factors	/165	/058	2/855	/004	
Academic resilience	<---	School factors	/416	/101	4/114	***	
Academic performance	<---	Academic resilience	/169	/120	1/407	/160	
Academic performance	<---	Academic Engagement	/314	/166	1/898	/058	
Academic performance	<---	Individual Factor	/241	/106	2/270	/023	
Academic performance	<---	School factors	/234	/123	1/903	/057	

According to Table 3, the effect of individual factors on academic engagement and academic resilience was significant, because the critical ratio or T value is not in the range [1.96, -1.96] and its significance level was less than 0.01. Also, the effect of school factors on academic involvement and academic resilience was significant, because the critical ratio or T value was in the range of [1.96, -1.96] and its significance level was less than 0.05.

In addition, the effect of academic resilience on academic performance was not significant because the critical ratio or T value is in the range [1.96, -1.96] and its significance level is more than 0.05. Also, the effect of academic engagement on academic performance was significant, because the critical ratio or T value was in the range of [1.96, -1.96] and its significance level is greater than 0.05.

Finally, the effect of the individual factor on academic performance is significant, because the critical ratio or T value is not in the range of [1.96, -1.96] and its significance level is less than 0.05. Regarding the effect of school factors on academic performance, the critical ratio or T value is in the range of [1.96, -1.96] and its significance level is greater than 0.05, which is not significant.

Table 4. Structural equation to test the path coefficients of the hypotheses

			Estimate	Result
Academic Engagement	<---	Individual Factor	/490	Supported
Academic resilience	<---	Individual Factor	/419	Supported
Academic Engagement	<---	School factors	/217	Supported
Academic resilience	<---	School factors	/368	Supported
Academic performance	<---	Academic resilience	/140	Not Supported

Academic performance	<---	Academic Engagement	/175	Not Supported
Academic performance	<---	Individual Factor	/229	Supported
Academic performance	<---	School factors	/172	Not Supported

The result of Table 4 showed that the effect of individual coefficient on academic participation was 0.49 and direct. The effect of the individual factor on academic resilience was 0.42 and direct. The effect of school factors on academic engagement was 0.22 and direct. The effect of school factors on academic resilience is 0.37 and direct. The effect of academic resilience on academic performance is 0.14 and was not significant.

Discussion

This study suggests a structural model about the relationship between individual and school factors affecting academic performance with the mediating role of academic resilience and academic engagement. The results of the research have indicated that the theoretical model is compatible with the data set. Based on the findings of the present study, individual factors have significant direct effects on academic achievement, academic engagement and academic resilience. This finding shows similarities with the results in the body of literature (Duff et al., 2004; Dunsmore, 2005; Furnham et al. 2011). It seems that conscientiousness leads to an interest in the course. Individuals with conscientiousness tend to carry out their duties carefully, and try to raise their own performance and ensure progress. High persistence and high achievement guarantee academic success. People that are open to new assignments also enjoy experiencing more academic engagement.

One of the most important individual factors affecting the academic performance is the self-confident of the students. Having a strong sense of self-confidence brings about many positive outcomes in students: they know how to plan and implement their tasks and be more productive; they are confident about handling challenging tasks, put in greater effort, are more persistent, set high but achievable targets for themselves, feel less anxiety, are more effective in their life strategies, are cognitively efficient and generally achieve a higher level of achievement (Lodewyk & Winner, 2005).

Accordingly, the school factor has effective role on academic resilience, academic engagement and academic performance of students. Compared to other students, resilient students had a positive perception of the school factors. Also, Rashidi et al. (Morrison & Allen, 2007) found a positive and significant relationship between the perception of the learning environment and academic resilience of students. On the other hand, theoretically, the learning environment is considered an effective contextual factor in promoting academic resilience. As MacDonald and Valdiso believe, the learning environment is generally effective in learners' resilience by providing opportunities for growth and emotional, motivational and strategic support.

According to the results obtained from the current research, academic resilience and academic engagement has a significant effect on academic performance. Also researches established strong association of resilience to academic performance. This is crucial for program developers and counselors to develop counseling intervention that is appropriate for the students to increase their school performance and overall psychological well-being. The results obtained in this research are based on Prince-Embury and Saklofske research (2004) regarding the relationship of resilience with more self-management and more engagement with homework. The research of skinner et al. (2014) and the research of Rajan, Harifa, and Pienyu (2017) regarding the relationship between academic resilience and academic engagement. Also Groccia's research (2018) is consist with the relationship between internal motivation and academic engagement. Researchers of characteristics of the learner, the learning environment, and the quality of instruction the learner receives (Haertel, Walberg, & Weinstein, 1983; Wang, Haertel, & Welberg, 1993) reached the same conclusion. further studies have found that students with resilient characteristics were more predisposed to school engagement. Tang, Wang, Guo, Salmela-Aro (2019) in their research of School burnout and psychosocial problems among adolescents.

Fostering students' motivation (e.g., self-efficacy) and social factors (e.g., teacher support) is one pathway to heighten and enhance students' proactive engagement in school and academic-related activities. Students with high school engagement perform well academically. The present finding is consistent with the finding of past studies (Fallon, 2010; Haney, 2010; Wang & Holcombe, 2010; Sbrocco, 2009; Flower & Flower, 2008; Stewart, 2007; Sirin & Sirin, 2005) which concluded that school engagement is closely related to academic performance. Children feel that they have the attention and support of teachers and parents in their academic and school activities, they will naturally develop a special sense of belonging and attachment to both school and school-related activities, including academic activities. Thus, there is a tendency for such children to achieve higher grades and generally show better academic achievements. Also, students who value their education and have clear ideas about goals they wish to achieve will exhibit a desire for status attainment and be higher performing students (Carbonaro, 2005).

Although the current study has revealed the relationship between individual and school factors affecting academic performance with the mediating role of academic resilience, several limitations need to be considered. Firstly, the examined sample and the present participants are only from the students of secondary school in Babil governorate in Iraq. Also, the data collection tool in this research was a questionnaire that has a self-reporting aspect. For this reason, it is not without problems and bias in answering. This research can expand in other educational levels, including university levels, or in other cities with different recreational and educational facilities and adding some variables such as influence of living conditions on academic performance. In order to determine genuine cause-effect relationships, further research that follows experimental design patterns in examining the effects of certain independent variables and ways of thinking upon CT skills is recommended (Creswell, 2008).

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