

Research Article

Predicting Students' Academic Achievement through Teaching and Parenting Styles: Self-Concept as a Mediator

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Understanding how individual, school, and social factors interact to shape students' academic achievement gives a better insight into the relative effects of these factors in the presence of other variables. The current study ($N = 604$) utilized a mediation model to examine the mediation role of two dimensions of students' self-concept (academic and social) in the relationships between teaching and parenting styles and students' Mathematics achievement. The researchers used a non-Western sample of middle school Omani students. Direct significant effects were found for permissive mothers, permissive teachers, and Mathematics self-concept on students' Mathematics achievement. Mothers' parenting styles' effects were more pronounced than fathers' styles on children's self-concept and Mathematics achievement. All three teaching styles significantly predicted Mathematics achievement directly or indirectly through self-concept. Mathematics self-concept acted as a mediator in this model while social self-concept did not. The findings are discussed within a cultural context.

1. Introduction

Students' academic achievement is considered one of the important outcomes that educational systems seek to improve; high academic achievement is, therefore, a significant indicator of a successful educational system. However, understanding the factors that can influence students' academic achievement is not easy. Complicated factors work together to affect academic achievement, which varies depending on school, social, and individual factors. Hence, the current study utilized a path analysis design to investigate the direct and indirect effects of school (teaching style and academic self-concept) and social factors (parenting styles and social self-concept) on students' academic achievement. More specifically, the current study examined the effects of parenting and teaching styles (i.e., authoritative, authoritarian, and permissive) on academic achievement through the mediational role of self-concept (academic and social).

Five paths are examined in this study as follows: (1) The effects of parenting styles on academic achievement. (2) The effects of parenting styles on self-concept (academic and social self-concepts). (3) The effects of teaching styles on

academic achievement. (4) The effects of teaching styles on self-concept (academic and social self-concepts). (5) The effects of self-concept (academic and social self-concepts) on academic achievement.

1.1. Parenting Styles Effects on Academic Achievement. A widely known framework of parenting styles is Baumrind's framework. According to Baumrind [1], these styles are understood based on two main dimensions: demandingness and responsiveness. Demandingness entails autonomy support, strong behavioral control, high expectations, monitoring, and consistent discipline, whereas responsiveness involves meeting individual needs, caring, warmth, clear communication, and attachment [1]. Thus, based on these two dimensions, parenting styles are categorized as authoritative parenting—high in both demandingness and responsiveness, authoritarian parenting—high in demandingness but low in responsiveness, and permissive parenting—low in demandingness but high in responsiveness [1]. As explained by Baumrind [2], the demandingness dimension leads to the most favorable results when manifested in an authoritative figure rather than an authoritarian figure. Bearing in mind, an authoritative parent incorporates monitoring

and firm control with warmth and autonomy support. Likewise, the responsiveness dimension results in more optimal outcomes when combined with the high demandingness, authoritative style, than when joined with the low demandingness, permissive style.

Baumrind [3] described permissive parents as those likely to deal with their child's actions and desires in a "non-punitive, acceptant, and affirmative manner" (p. 889). These parents negotiate decisions with the child and explain family rules and discipline. They do not expect the child to see them as an infallible figure to be copied, but they present themselves as a resource from which the child can benefit. On the other hand, authoritarian parents attempt to "shape, control, and evaluate" a child's behavior according to "a set standard of conduct" (p. 890). They believe in restricting the child's autonomy and consider obedience as a virtue. In between these two styles (i.e., permissive and authoritarian), authoritative parents are those who direct the child's actions and behavior in a strong yet fair way. These parents apply firm control, but they explain the reasoning behind their plans and decisions; they encourage verbal discussion and obedience, rather than demand them.

Parents influence their children's behavior and many school and life outcomes through these different styles. Cumulative studies have reported the effects of parenting styles on various school outcomes such as goals orientation (e.g., [4, 5]), social adjustment (e.g., [6]), self-esteem, self-concept (e.g., [7, 8]), academic achievement (e.g., [9–17]), academic procrastination [18], and academic motivation [19, 20].

Regarding authoritative parenting effects on academic achievement, a meta-analysis of different studies demonstrated that concurrent and longitudinal positive relationships were found between authoritative parenting style and academic achievement. Moreover, analysis of cross-lagged effects indicated that, over time, authoritative parenting style predicted increases in academic achievement [21]. Similarly, Borak et al. [22] asserted that mothers' and fathers' authoritative parenting styles, as measured separately, positively, and significantly correlated with students' academic achievement. In Iran, it was found that authoritative Iranian mothers positively affected adolescent girls' academic achievement. Furthermore, authoritative mothers' involvement, in contrast to authoritarian and permissive involvement, was a positive predictor of academic achievement [10]. Positive effects of authoritative parenting on students' academic achievement were reported by many researchers (e.g., [9, 13, 17, 23, 24]). In addition, a review of 15 studies showed that authoritative parenting style, compared to authoritarian and permissive styles, produced the best outcomes among children in terms of autonomy, academic motivation, and relatedness [18–20].

On the other hand, cumulative studies have highlighted that authoritarian parenting negatively influences student achievement. Students with authoritarian parents had lower academic achievement compared with their peers who had authoritative parents [21, 25]. Likewise, several studies reported the same effects (e.g., [8, 9, 22, 23, 26, 27]).

Nevertheless, it should be noted that all previously mentioned studies regarding authoritarian parents' influence were in Western contexts. Studies conducted in Eastern

cultures showed inconsistent results of authoritarian parents' effects on their children's outcomes. For instance, similar to the previous Western studies, some Eastern studies reported negative effects of authoritarian parenting on students' outcomes, such as psychological and nonpsychological problems [28], learning motivation [29], academic identity [30], academic achievement [9, 26], and self-compassion [31].

In contrast, Huang and Gove [32] speculated that, in Asian culture, it is not always authoritative parents whose parenting results in positive outcomes; authoritarian parents may also positively predict student outcomes. For example, authoritarian fathers were found to positively predict moral intelligence among Omani middle and high school students [29]. Furthermore, authoritarian parenting styles positively correlated with Ethiopian adolescents' academic achievement [13]. Yang and Zhao [17] reported that authoritarian parenting was the most common style influencing Chinese students, and it positively affected their academic achievement. Other studies also purported positive effects of authoritarian parenting on Asian students' academic achievement (e.g., [33, 34]). On the other hand, some studies found no effects of authoritarian parenting on achievement or other outcomes [10, 20, 35, 36].

A meta-analysis of different studies showed that permissive parenting is associated with low academic achievement [21]. Similar negative effects of permissive parenting on children's academic achievement were documented in other studies (e.g., [8, 22, 23, 26]). However, some studies found that permissive parenting styles did not affect students' achievement [10, 25, 27, 36].

The method of influence is not always the same, however. Parenting styles do not necessarily impact academic achievement directly; they can do so through mediating variables. According to Amani et al. [10], authoritative parenting positively influences academic achievement through self-regulated learning and parental involvement in academic life. In addition, Masud et al. [36] found no direct effects of the three parenting styles (authoritative, authoritarian, and permissive) on academic achievement. However, there was an indirect effect of authoritative parenting styles on academic achievement through the mediational effects of self-efficacy, mastery goals, and performance goals. In another study, authoritarian parenting had negative and positive effects on achievement through the mediational effects of students' different goal orientations [33]. Alsaidi [9] found both direct and indirect effects for parenting styles on students' academic achievement through the mediational effects of students' goal orientations. Recently, Huang et al. [18] reported mediational effects of coping style and resilience in the relationship between parenting styles and academic procrastination. The indirect effects of these styles on student outcomes have been reported by other researchers as well (e.g., [9, 11, 18, 25, 29, 37]). The next section examines the effects of parenting styles on self-concept, which is considered in the current study as a mediator in the relationship between parenting styles and academic achievement.

1.2. Parenting Styles Effects on Self-Concept. Many factors can work together to influence students' self-concept. It should

be made clear that academic factors are not the only important predictors of self-concept. Parents can affect their children's self-concept in different ways through their parenting styles. Garcia and Serra [38] maintained that, unlike authoritarian parents, authoritative parents resulted in high levels of self-esteem (academic/professional, emotional, and family) among Spanish adolescents and adults. Furthermore, according to Niaraki and Rahimi [39], students with authoritative parents had higher levels of self-concept than their peers with authoritarian or permissive parents. Moreover, authoritative fathers and mothers were found to positively predict Omani adolescents' social self-concept [40] and physical self-concept [35].

Many studies have attempted to examine the impact of authoritarian parenting styles on students' self-concept. For example, Garcia and Serra [38] highlighted that having authoritarian parents led to the lowest levels of self-esteem. Also, a significant negative correlation was found between authoritarian fathers and secondary school students' self-esteem; yet, having authoritarian mothers was found to be uncorrelated with self-esteem in children [7]. Other studies also found no significant correlation between authoritarian mothers and fathers and self-concept [8, 37]. However, a different result was found by Alsaidi and Aldhafri [40] who reported a positive correlation between authoritarian fathers and mothers and social self-concept; despite this finding, the regression analysis showed no predictive role of authoritarian parents on social self-concept.

Permissive fathers negatively predicted Omani adolescents' physical self-concept while permissive mothers did not [35]. On the other hand, some studies showed no significant relationships between permissive parents and academic or social self-concept [8, 40]. In much the same way as parents, teachers also have an impact on their students' academic achievement and self-concept. The following paragraphs discuss the effects of teaching styles on students' academic achievement as well as their effects on students' self-concept.

1.3. Teaching Styles Effects on Academic Achievement. Teachers are a very important component of any schooling experience, and they are believed to significantly impact student outcomes and academic achievement [41]. One important aspect of teachers' influence on student outcomes is teaching styles. Three common teaching styles that have been comprehensively addressed in the literature are authoritative, authoritarian, and permissive teaching styles. Many researchers define teaching styles in accordance with Baumrind's [1] framework of parenting styles, as clarified earlier. In this framework, authoritative teachers are high in both demandingness and responsiveness, authoritarian teachers are high in demandingness but low in responsiveness, and permissive teachers are high in responsiveness and low in demandingness [42]. These two dimensions—demandingness and responsiveness—are sometimes referred to as control and nurturance. Authoritative teachers are known to use positive instructional practices with high levels of nurture and control; they give nurturing statements and demand self-management from students. In contrast, the instructional

practices of authoritarian teachers are characterized by non-nurtured and highly controlled contexts. The instructional practices of permissive teachers, conversely, result in typically non-controlling and moderately nurturing contexts [43].

Authoritative teachers affect their students through their practices. For example, Amaral et al. [44] argued that an authoritative school environment, characterized by a disciplinary structure and support, can aid in preventing school violence. In addition, authoritative teaching was found by Cakır [45] to positively predict three dimensions of student empowerment (meaningfulness, impact, and competence). Authoritative teaching has also been found to positively predict students' intrinsic mathematics motivation and negatively predict their extrinsic mathematics motivation [46]. Positive effects of authoritative teachers have been documented in other studies as well (e.g., [47, 48]).

Students' perceptions of authoritarian teachers were found to be a strong predictor of their tendency to bully others; this predictive power was even stronger than their perceptions of authoritarian fathers and mothers [49]. Moreover, Bassett et al. [47] indicated that students who were taught by authoritarian teachers rated the teacher unfavorably and showed low levels of interest in the course. Authoritarian math teachers were also found to be positive significant predictors of students' extrinsic motivation [46].

Studies have also assessed permissive teachers' influences on student outcomes. As stated by Walker [43], students of permissive teachers are as engaged in the classroom as their peers in authoritative classrooms; yet, they achieve lower than these peers because of the permissive teachers' lack of control and inconsistency in applying rules. Permissive teachers strongly believe in the significance of relationships; they tend to be responsive with their students and provide them with support and motivation but have low expectations of their students. The absence of demands and strict orders leads to negative effects on the students [42].

Some studies were located by the researchers that have examined the direct or indirect effects of these three teaching styles (authoritative, authoritarian, and permissive) on students' academic achievement. For instance, two main factors of the authoritative school climate, structure and support, were found to be associated with students' engagement, which, in turn, affected students' academic achievement [50]. Similarly, Cornell et al. [48] found that an authoritative school climate, in contrast to authoritarian and permissive climates, was associated with higher course grades in both middle and high school samples. In another study, students who expected to get D grades perceived their teachers as being authoritarian more than students who expected A or B grades; and students who expected A grades evaluated their teachers to be more authoritative than those who expected grades of C or D [47].

However, some studies uncovered different results. For example, Lee [51] found that only the teacher-student relationship dimension (responsiveness) of authoritative teaching predicted students' reading achievement, but academic pressure (demandingness) was not a predictor. Interestingly, Barker et al. [52] found no effects of authoritative teaching

on reading achievement. And, in contrast to most studies, Dever and Karabenick [53] demonstrated that the authoritarian teaching style had a positive effect on middle and high school students' achievement in the United States.

These contradicting results of teaching style effects on student academic achievement can be better understood by considering the effect of mediational factors in the relationships between teaching styles and student achievement. The researchers argue that mediational variables such as self-concept are influencing the relationship between teaching styles and academic achievement. The next sections examine how teaching styles influence self-concept.

1.4. Teaching Style Effects on Self-Concept. Although teaching styles have been widely investigated in relation to student outcomes such as motivation (e.g., [46, 54]), student interest (e.g., [47]), and academic engagement (e.g., [48]), very few studies have examined the effects of teaching styles on student self-concept or similar constructs such as self-efficacy beliefs. One such study by Alrajhi and Aldhafri [55] indicated that authoritative and permissive teaching styles positively predicted female students' academic self-concept; while male students' academic self-concept was not predicted by any of the teaching styles (authoritative, authoritarian, and permissive).

In contrast to the authoritative teaching style, Leban [56] found that the excessive control and unresponsiveness characterizing the approach of authoritarian teachers pushed students to develop low self-efficacy and spend less time at school. Moreover, in Walker's [42] study, although all the participants started the middle school year with strong self-efficacy, students with an authoritarian teacher ended the first semester with a lower level of social self-efficacy than their peers with a permissive teacher and a lower level of academic self-efficacy than their peers in an authoritative class. Unlike the previous results, Alrajhi and Aldhafri [55] found no effect of authoritarian teachers on their students' academic and social self-concept.

1.5. Self-Concept Effects on Academic Achievement. As noted earlier, parenting and teaching styles may affect students' academic achievement directly or indirectly. In the current study, we propose that self-concept is one of the mediational variables through which parenting and teaching styles influence academic achievement. Various definitions have been documented in the literature to explain self-concept. It was defined by Krishnakar and Chengti [57, p. 2] as an "accumulation of knowledge about the self". It can be said that "negative self-evaluation and self-hatred" are equated with negative self-concept, while positive "self-evaluation, self-respect, and self-acceptance" are linked with positive self-concept [58, p.7].

A significant role of self-concept is thought to be its influence on students' academic achievement. Because self-concept is believed to be a predictor of high students' academic achievement, it is an important factor to consider when examining academic success. Hence, researchers are motivated to more fully understand the relationship between self-concept and academic achievement. Some studies have

used regression analysis to examine the predictive effects of self-concept on achievement. For instance, negative self-concept was found to negatively predict university students' academic achievement in modern algebra [59]. Dagnew [8] pointed out that academic self-concept positively predicted secondary school students' academic achievement. Similar results showing mathematics self-concept predicting math achievement have been found by other researchers using regression analysis or SEM (e.g., [60–62]).

In addition to studies utilizing regression analysis, correlational design has been used to examine the relationship between self-concept and academic achievement. Various correlational studies have reported significant correlations between self-concept and academic achievement (e.g., [63–65]).

Some studies have examined the role of self-concept as a mediator in the relationships between different psychological variables and academic success. For instance, Klapp [66] investigated the mediational role of Swedish and Mathematics self-concepts in the relationship between summative assessment (grading) and academic achievement among school students. The results indicated that academic self-concept does indeed mediate the relationship between grading and subsequent academic achievement. Students who received low grades exhibited low self-concept regarding their ability in Mathematics and Swedish, which in turn, negatively affected their academic achievement. A similar result showed that academic self-concept mediated the relationship between achievement goals and academic achievement especially with a group of overachieving students [67]. In a study using path analysis, Zhou et al. [68] showed that academic self-concept in college students was found to be a direct and indirect predictor of students' GPAs. However, they found that college social self-concept was not a direct predictor of GPA, but that precollege social self-concept predicted college academic self-concept which, in turn, positively predicted college GPA. In another study, Mathematics self-concept was found to play a mediational role in the relationships between Mathematics motivation and emotions toward Mathematics. In addition, higher level of Mathematics self-concept was reported among higher achieving students in Mathematics [69]. According to Ma et al. [70], reading self-concept mediated the role between teachers' feedback and reading achievement across different cultures. In addition, reading self-concept was found as a mediator in the relationship between positive disciplinary climate and reading achievement.

1.6. Context of the Study. As described in the literature review, many studies have examined the effects of teaching and parenting styles on students' academic achievement. These styles may affect students' achievement either directly or indirectly through other psychological variables. This study targeted students in the middle adolescence period, which is known as a time of great change and development for the students. During this period, the students go through "much disturbance...changes and growth in all directions" [71, p. 1]. Thus, it is important to try to understand these changes and the factors affecting them. The current study examines combinations of two types of variables that may

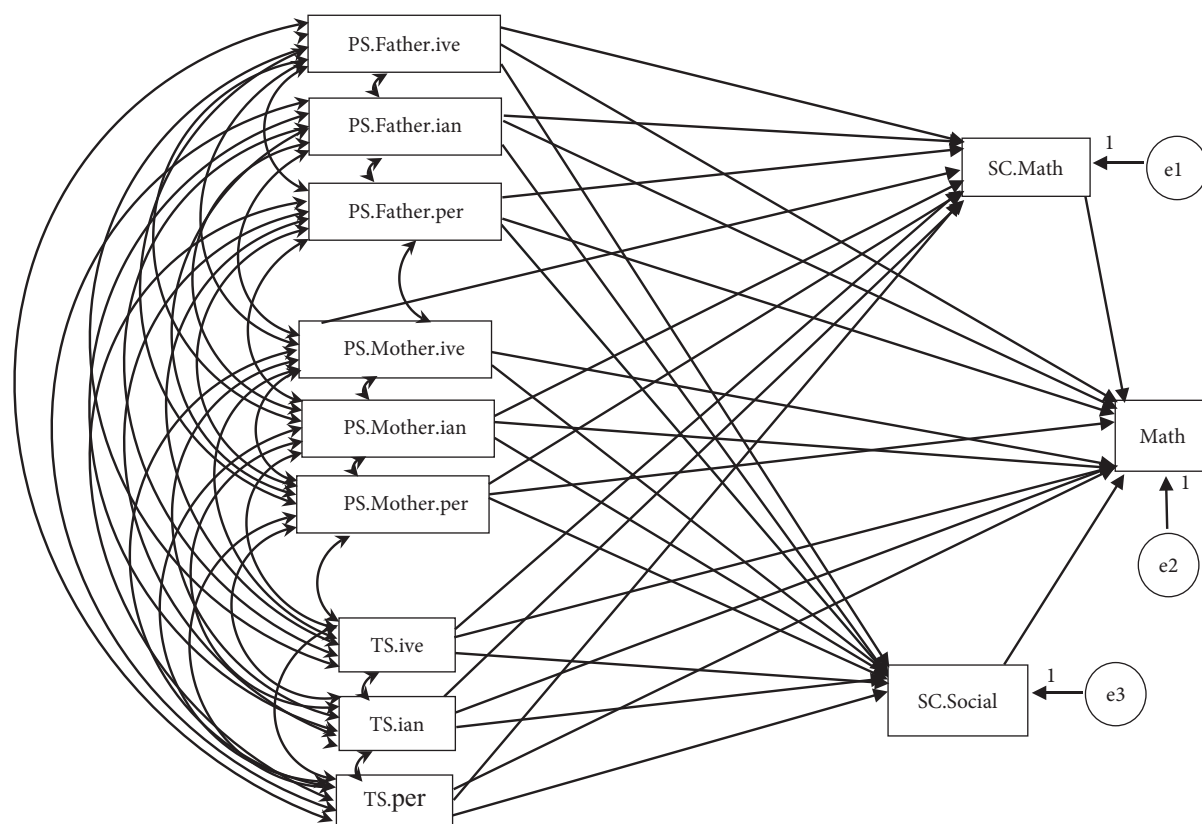


FIGURE 1: The proposed model for the direct and indirect effects of parenting styles and teaching styles on math achievement.

influence Mathematics achievement—school variables (i.e., teaching styles and Mathematics self-concept) and social variables (i.e., parenting styles, and social self-concept). It investigates the direct and indirect (through self-concept) effects of parenting and teaching styles on Mathematics achievement. Moreover, the study examines the two sets of variables (i.e., school and social) in the same mediational model. Figure 1 demonstrates the theoretical mediational model developed in the current study.

2. Methods

2.1. The Sample. The sample consisted of 604 students (68.2% were females) from three school districts in the Sultanate of Oman. These schools were selected by a way of convenient sampling. The students were in grades 7, 8, 9, and 10 with ages ranging from 11 to 18 ($M = 14.37$, $SD = 1.21$). The participants were invited to participate in the study during a visit to their classroom by the researchers. Permission to collect data was obtained from the Ministry of Education Ethics Committee, from the school district, and from the school principal. The students were informed that participation in the study was voluntary and that they had the right to decide not to participate and withdraw at any time. The students were also assured of confidentiality and anonymity regarding the data. No identifying information was obtained from the participants. All students chose to respond to the study questionnaires and handed in their completed questionnaires and consent forms to the researchers. The students were asked to

evaluate their mothers' and fathers' parenting styles separately on the PAQ and their Mathematics teachers' teaching styles on the TAQ, as clarified below. The participants took approximately 35 min on average to complete all three questionnaires used in the current study.

2.2. The Study Questionnaires. The researchers utilized three questionnaires to gather the data in order to examine the proposed mediational model. These were the Parenting Authority Questionnaire (PAQ) [72], the Teacher Authority Questionnaire (TAQ) [46], and the Self-Definition Questionnaire (SDQ-I) [73].

2.3. The Parenting Authority Questionnaire. The PAQ [72] is a widely used questionnaire that deals with the three major parenting styles: authoritative, authoritarian, and permissive. It is written for children to evaluate their perceptions of their parents. We examined these perceptions separately for each parent as suggested by earlier research [9, 74]. To elaborate, the child has to make a separate evaluation once for the mother and once for the father for each item. Multiple studies have used the PAQ in the Omani context and it has demonstrated good validity and reliability (e.g., [35, 37]). The current study utilized the short version developed by Alkharusi et al. [75] which consists of 20 items. Examples of items are as follows: authoritarian parents (seven items, he/she expects me to do what he/she requests without any discussion), authoritative parents (seven items, he/she discusses with me the reasons behind the behavioral controls inside the family), and permissive parents (six items, he/she

TABLE 1: Reliability coefficients of the study questionnaires.

| Variable | Number of items | α | Variable | Number of items | α |
|------------|-----------------|----------|-----------|-----------------|----------|
| Father.ive | 7 | 0.80 | SC.Math | 8 | 0.92 |
| Father.ian | 7 | 0.70 | SC.Social | 8 | 0.82 |
| Father.per | 6 | 0.72 | TS.ive | 7 | 0.77 |
| Mother.ive | 7 | 0.76 | TS.ian | 7 | 0.63 |
| Mother.ian | 7 | 0.68 | TS.per | 6 | 0.64 |
| Mother.per | 6 | 0.73 | — | — | — |

Note: SC, self-concept; ive, authoritative; ian, authoritarian; per, permissive; and TS, teaching styles.

TABLE 2: Correlation coefficients between parenting styles, teaching styles, self-concept, and math achievement.

| Variable | Father parenting styles | | | Mother parenting styles | | | Teaching styles | | | SC. social | SC.math |
|-----------|-------------------------|------------|------------|-------------------------|------------|------------|-----------------|--------|---------|------------|---------|
| | Father.ive | Father.ian | Father.per | Mother.ive | Mother.ian | Mother.per | TS.ive | TS.ian | TS.per | | |
| SC.Math | 0.22** | 0.11** | -0.10** | 0.28** | 0.08* | -0.08* | 0.45** | 0.34** | 0.04 | 0.11** | — |
| SC.Social | 0.22** | 0.12** | 0.02 | 0.20** | 0.10** | 0.01 | 0.17** | 0.15** | 0.08* | — | 0.11** |
| Math | 0.05 | -0.05 | -0.30** | 0.13** | -0.08* | -0.29** | 0.20** | 0.10** | -0.21** | 0.07 | 0.60** |

Note: SC, self-concept; ive, authoritative; ian, authoritarian; per, permissive; and TS, teaching styles. * $p \leq 0.05$, ** $p \leq 0.01$.

believes that children need the freedom to think and do whatever they want, even if it is against the wishes of their parents). Using confirmatory factor analysis, Alkharusi et al. [75] confirmed the three-factor structure of the PAQ that corresponds to the three factors generated by Buri [72]. Table 1 shows evidence of good reliability for the six parenting styles (three styles for each parent) using the current study data.

2.4. The Teaching Authority Questionnaire. The TAQ examines three teaching styles (authoritative, authoritarian, and permissive) that correspond to the three parenting styles used in the PAQ. The TAQ was first constructed by Aldhafri and Alrajhi [46] using an Omani school student sample and proved to be a valid measure. Again the short version of the 20 items was used. The TAQ items were rephrased to match the PAQ items but applied to the school context. For instance, the item “He/she believes that it is wise for the parents to educate their children early on who has the authority in the family” has been changed to “He/she believes that it is wise for the teacher to teach his/her students from the first day of school who has the authority in the class.” The TAQ questions are 5-point Likert scale items (totally agree, agree, indifferent, disagree, and totally disagree). The scores range from 20 to 100 for each participant for the three styles. High scores indicate that a teacher exhibits high levels of the style as perceived by his/her student. Reliability coefficients ranged from 0.64 (for authoritarian teaching style) to 0.82 (for authoritative teaching style) [46, 55]. Table 1 displays the reliability coefficients for the TAQ using the current sample.

2.5. The Self-Concept Questionnaire. The third questionnaire used in the current study was the SDQ-I [76]. The original questionnaire included 67 items that examined different dimensions of students’ self-concept. Our sample completed questions on two dimensions only—the Mathematics self-concept (eight items, e.g., “I am excellent in this subject”) and the social self-concept (eight items, e.g., “It is easy for me to be loved by others”). The social self-concept items were

TABLE 3: Fit indices for the final proposed models.

| RMSEA | NFI | GFI | AGFI | TLI | CFI | CMIN/DF |
|-------|------|------|------|------|------|---------|
| 0.01 | 0.99 | 0.99 | 0.98 | 0.99 | 0.99 | 1.10 |

extracted from the original peer relationships self-concept. The SDQ questions are also 5-point Likert scale items (mostly false, false, sometimes true/sometimes false, true, and mostly true). Higher scores represent higher levels of self-concept. Previous Omani studies reported good validity and reliability evidence for the SDQ [55, 76]. The reliability values for the current data can be seen in Table 1.

2.6. Student Mathematics Achievement. Students’ Mathematics achievement was collected by asking the students to report their final Mathematics grades based on the previous semester’s final exam.

3. Results

To examine the proposed model, the Pearson correlation coefficient was calculated to identify the size and type of correlations between parenting styles (authoritative father, authoritarian father, permissive father, authoritative mother, authoritarian mother, and permissive mother), Mathematics teachers’ teaching styles (authoritative, authoritarian, and permissive), self-concept (Mathematics and social), and Mathematics achievement. Table 2 shows that the most of the correlations are significant except for math self-concept and permissive teaching style, social self-concept and each of permissive father and permissive mother, Mathematics achievement and each of authoritative and authoritarian father, and social self-concept.

The researchers built the proposed mediation model as shown in Figure 1 by applying path analysis using AMOS 24. All insignificant paths were excluded to ensure the suitability of the model for the purpose of this study and the appropriateness of the data for analysis. As shown in Table 3, fit

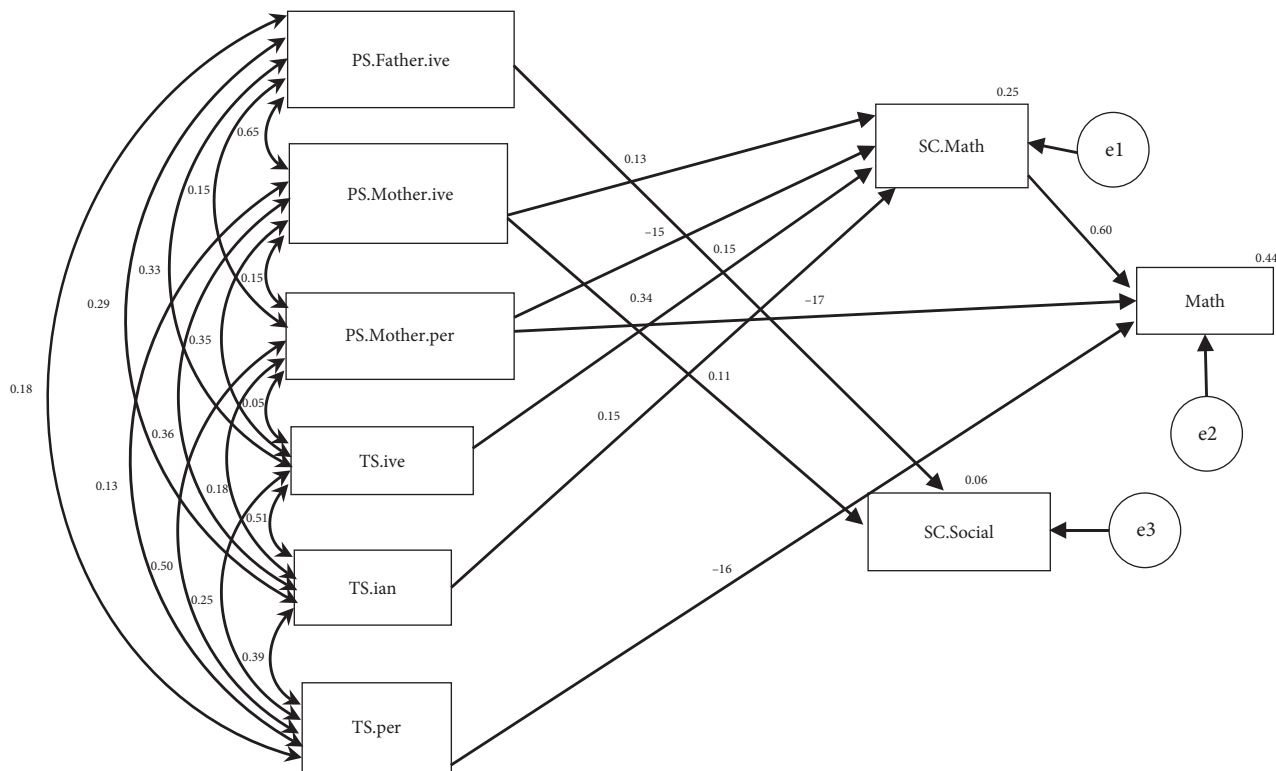


FIGURE 2: The final model of direct and indirect effects between the study variables.

TABLE 4: The direct and indirect effects of the parenting styles, teaching styles, and self-concept on math achievement.

| F. MODEL | Estimate | SE | C.R. | Direct effects | Indirect effects | Squared multiple correlations |
|------------------------|----------|------|----------|----------------|------------------|-------------------------------|
| Mother.per → Math | −2.85 | 0.61 | −4.66*** | −0.17 | — | — |
| Ts. per → Math | −3.33 | 0.72 | −4.59*** | −0.16 | — | — |
| SC.Math → Math | 10.62 | 0.55 | 19.20*** | 0.60 | — | — |
| Father.ive → SC.Social | 0.13 | 0.04 | 2.94** | 0.15 | — | 0.44 |
| Mother.ive → SC.Social | 0.11 | 0.05 | 2.05* | 0.10 | — | — |
| Mother.ive → SC.Math | 0.18 | 0.05 | 3.47*** | 0.13 | — | — |
| Mother.per → SC.Math | −0.14 | 0.03 | 4.07*** | −0.15 | — | — |
| Ts.ive → SC.Math | 0.39 | 0.05 | 7.97*** | 0.34 | — | — |
| Ts.ian → SC.Math | 0.18 | 0.05 | 3.43*** | 0.15 | — | — |
| Mother.ive → Math | — | 0.54 | 3.53*** | — | 0.07 | — |
| Mother.per → Math | — | 0.32 | −4.35*** | — | −0.08 | — |
| Ts.ive → Math | — | 0.57 | 7.23*** | — | 0.19 | — |
| Ts.ian → Math | — | 0.54 | 3.35*** | — | 0.08 | — |

Note: PS.Father.ive, parenting styles, authoritative father; PS.Father.ian, parenting styles, authoritarian father; PS.Father.per, parenting styles, permissive father; PS.Mother.ive, parenting styles, authoritative mother; PS.Mother.ian, parenting styles, authoritarian mother; PS.Mother.per, parenting styles, permissive mother; TS.ive, teaching style, authoritative; TS.ian, teaching style, authoritarian; TS.per, teaching style, permissive; SC.Math, math self-concept; SC.Social, social self-concept; Math, math achievement. Estimate, unstandardized regression weights; SE, standard errors; C.R., regression weight estimate divided by the estimate of its standard error; direct effects, standardized regression weights. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

indices are verified and all of them occurred within the recognized range (RMSEA = 0.08 or less, CFI = 0.95 or above, GFI = 0.90 or above, AGFI = 0.90 or above, TLI = 0.95 or above, NFI = 0.95 or above, CMIN/DF = 5, and less). This suggests that the final model is a good fit for the study data. Figure 2 shows the final proposed model of the direct and indirect effects between the study variables.

The path coefficients, as shown in Figure 2 and Table 4, indicate that there were statistically significant negative direct effects between permissive mother and Mathematics achievement and between permissive teachers and Mathematics achievement. However, a statistically significant positive direct effect was found between Mathematics self-concept and Mathematics achievement. In addition, statistically significant positive

direct effects were found between authoritative father and authoritative mother and social self-concept. Similarly, statistically significant positive direct effects were found between authoritative mother, authoritative and authoritarian teachers, and Mathematics self-concept. Conversely, a statistically significant negative direct effect was revealed between permissive mother and Mathematics self-concept.

It is clear from Figure 2 that, whereas social self-concept as a mediator had no direct effects on Mathematics achievement, Mathematics self-concept as a mediator did have a direct effect on Mathematics achievement. Therefore, by using the Sobel test [77, 78], the indirect effects of parenting styles (mothers and fathers) and teaching styles on Mathematics achievement were measured through Mathematics self-concept as a mediator variable.

As shown in Table 4, the results revealed four statistically significant indirect paths. It was found that authoritative mother, authoritative teachers, and authoritarian teachers had positive indirect effects on Mathematics achievement through Mathematics self-concept as a mediator. On the other hand, permissive mother had a negative indirect effect on Mathematics achievement with Mathematics self-concept acting as a mediator. The squared multiple correlation revealed that 44% of the variance in math achievement was explained by the model.

4. Discussion

The current study aimed to shed light on social and school factors as predictors of achievement. To achieve this, the researchers examined the direct effects of parenting and teaching styles (authoritative, authoritarian, and permissive) on students' Mathematics achievement. It also explored the indirect effects of parenting and teaching styles on Mathematics achievement through the mediational role of Mathematics and social self-concept.

4.1. The Direct Effects on Mathematics' Achievement. The findings of the study showed that only three factors directly predicted Mathematics achievement; these were permissive mothers (negatively), permissive teachers (negatively), and math self-concept (positively). None of the fathers' parenting styles had direct effects on Mathematics achievement. The negative effects resulting from permissiveness exhibited by either teachers or mothers in this study are in line with other studies which uncovered negative impacts of permissive parenting (e.g., [8, 21, 22, 26]) and permissive teaching styles (e.g., [42, 43]) on students' academic achievement. In addition, the findings from this study are in line with studies that found positive effects of academic self-concept on academic achievement (e.g., [8, 59, 61]).

Unexpectedly, these findings are inconsistent with previous studies which highlighted significant influences of other parenting styles (authoritative and authoritarian, e.g., [21, 22]) on academic achievement. It should be noted that most of these studies examined the collective effects of both mothers' and fathers' parenting styles, while the current study examined the separate effects of mothers' and fathers' parenting styles, which may be one reason behind the different results [9]. Moreover, the inclusion of teaching styles in the same

prediction model might have minimized the observed effects of parenting styles that are usually reported when only parenting styles are used in the model. In addition, the current study examines subject-related achievement (i.e., mathematics), which may result in a different pattern of relationships compared with studies that examine academic achievement in general.

As for the findings related to authoritarian parenting styles, studies conducted in Eastern cultures have reported inconsistent results. The results from this research are, therefore, in line with previous studies in Eastern contexts that reported no effects of authoritarian parenting on academic achievement and other outcomes (e.g., [10, 20, 35, 36]).

Also, it should be noted that very few studies could be found that highlighted direct significant effects of the three teaching styles (authoritative, authoritarian, and permissive) on academic achievement; those that did include Bassett et al. [47] and Cornell et al. [48]. However, most studies reported links between these styles and other outcomes such as school violence (e.g., [44]), bullying [49], empowerment Cakır [45], and course interest [47]. Interestingly, some studies found no effects of teaching styles on academic achievement (e.g., [52]). This may explain the absence of direct effects of Mathematics teachers with authoritative and authoritarian styles on Mathematics achievement. It may also indicate some hidden interaction among the activities that are used within each teaching style which may influence each subject achievement differently.

4.2. The Indirect Effects on Mathematics Achievement: The Role of School Variables over Social Variables. Regarding the indirect effects, the findings showed that only Mathematics self-concept had a significant role as a mediator, whereas social self-concept played no mediational role in the relationships between parenting and teaching styles and Mathematics achievement. This highlights the significant role (both direct and indirect) of school variables over social variables on Mathematics achievement. Other studies have also reported the mediational role of academic self-concept in academic achievement (e.g., [66, 68, 70]). It is possible, however, that social variables effects may outperform school variables effects if language self-concept and achievement are under investigation. Language acquisition involves social interaction and requires parental and teaching involvement in the social context of learning. Future research may examine these hypotheses.

The superior role of school variables over social variables is also clear from the direct and indirect correlations found between all types of teaching styles and Mathematics achievement. In contrast, only permissive mother (directly) and permissive and authoritative mothers (indirectly) had an effect on Mathematics achievement. Fathers' parenting styles and social self-concept showed neither direct nor indirect effects on Mathematics achievement.

4.3. Parenting Styles Indirect Effects on Mathematics Achievement. The results demonstrated that mothers' parenting styles (authoritative and permissive) were able to indirectly predict Mathematics achievement through Mathematics self-concept. Authoritative mothers positively and indirectly predicted Mathematics achievement, whereby permissive mothers did so negatively. On the

other hand, the parenting styles of fathers had no significant indirect effects. The indirect role of authoritative mothers on academic achievement was supported by Amani et al. [10], who argued that achievement was mediated through self-regulated learning and parental involvement. However, the indirect effect of permissive mothers via self-concept in the current study contradicts Amani et al. [10], who found no direct or indirect effects of permissive mothers. Other studies have also reported indirect effects of authoritative parenting on academic achievement through different mediators such as self-efficacy [11, 14, 36], and mastery goals and performance goals [33]. These effects could be due to the positive characteristics of authoritative parents as they foster a “mutual and bilateral relationship” [10, p. 65]. Students’ perceptions of authoritative parents are more positive than “unilateral” relationship fostering authoritarian parents (who do not respond sympathetically to children’s needs or value their perspectives) and permissive parents (who do not offer structured discipline) [10]. Mirzaei et al. [20] argued that the positive effects of authoritative parenting style can be understood through the characteristics of authoritative parents who show respect for their children’s views, involve them in decision making, behave as friends, and display realistic expectations of their children’s academic performance.

From the results of the current study, we can see that authoritarian parenting (for both mothers and fathers) had no effects on students’ achievement either directly or indirectly. The absence of a detectable influence from authoritarian parents is not surprising since studies conducted in Eastern cultures have reported inconsistent results. While some studies found positive effects of authoritarian parenting (e.g., [13, 29]), others found negative effects (e.g., [26, 28, 30]), and others, as with the current study, found no effects (e.g., [10, 20, 36]). Besides the possible effects of cultures, variation in the effects of authoritarian parenting may be attributed to the different conceptualizations and the measures used to examine this parenting style.

Pinquart [21] explained that although authoritative, authoritarian, and permissive parenting styles were found to be associated with academic achievement, those associations had small effect sizes. The author suggested that these findings do not support the view speculated by some researchers that parenting styles are the most important factors influencing achievement. It is also important to note that specific parenting practices directed at enhancing students’ academic performance (e.g., communication about school issues) can be more influential than general parenting style descriptions [11, 15]. In addition, the cross-lagged effect suggests that it is vital to consider not only the effect of parenting styles on achievement but also the effect of student achievement on their parents’ styles and practices. For example, achieving highly in school may cause parents to have positive feelings toward their children. There is, however, a lack of research that addresses the effects of children’s academic achievement on how they are parented.

4.4. The Comparative Role of Mothers’ Parenting Style over Fathers’ Parenting Styles. It is important to highlight the absence of fathers’ parenting style effects on academic

achievement, which might be due to the fact that mothers are more engaged in their children’s learning than fathers who may be more focused on other activities inside and outside the home. Recently in Oman, mothers’ roles have changed compared to the past when their roles as full-time housewives were more of a cultural expectation [79]. These days, mothers are often found working in many different sectors of the workforce. However, despite this change in their roles, it is still common in Omani families for mothers to hold more responsibility for maintaining a household than fathers and have more involvement in their children’s schooling. This may explain why mothers’ parenting styles showed more notable effects than fathers’ in the current study. Alsaidi [9] attributed the significant effects of mothers’ parenting styles on students’ academic achievement to the amount of time mothers spend with their children, the personality types of mothers that are supportive and open for dialog with children, and the encouragement that mothers usually show to support their children’s problem solving and independent learning.

4.5. Teaching Styles’ Indirect Effects on Mathematics Achievement. The results also revealed that authoritative and authoritarian mathematics teachers were significant positive indirect predictors of Mathematics achievement through Mathematics self-concept. In line with this result, Konold et al. [50] also showed positive indirect effects of authoritative teachers on student achievement through their effects on student engagement. Although very rare, authoritarian teachers have also been found to positively and directly influence achievement [53]. However, no studies were located by the researchers that supported the idea of indirect effects of authoritarian teachers on student achievement. It is believed that the main reason authoritative teachers have positive impacts on student outcomes is due to their balance of nurturing and control in the classroom [43]. On the other hand, authoritarian teachers’ positive influence on student outcomes, although not very common, could be attributed to their demanding and controlling practices. These may influence students to act in a more disciplined manner, which, in turn, affects their achievement. Moreover, the effects of teaching styles may function differently across school subjects, a possibility that waits for future exploration.

4.6. Parenting Styles’ Effects on Academic and Social Self-Concept. In contrast to the lack of fathers’ parenting style effects on academic achievement in the current study, the current results indicated a positive direct effect of authoritative fathers on their children’s social self-concept. Moreover, social self-concept was found to be positively predicted by authoritative mothers. As noted earlier, authoritative parenting usually leads to more optimal results compared to other styles [11]. Despite the fact that social self-concept was not predicted by the other parenting styles or by any of the teaching styles, the results highlight the vital role of authoritative mothers and fathers in the social lives of their children. Through their nurturance and control practices, authoritative parents can help their children to develop a positive social image of themselves and their social relations with

others. A similar result was also found in a study with Omani adolescents in which authoritative fathers and mothers positively predicted social self-concept in their children [40]. The positive effects of authoritative parents on different dimensions of self-concept and self-esteem have also been supported by other studies (e.g., [35, 38, 39]). A cross-cultural study may shed the light on the interaction of these variables in Western and non-Western family context. Tsela et al. [15, p. 9] argued that “a clear boundary between Eastern and Western cultures” may explain the variation of the effects of authoritarian parenting styles in children’s outcomes.

As stated earlier, when it comes to academic outcomes, only mothers were found to have significant effects. The current findings showed that only permissive (negatively) and authoritative (positively) mothers were able to predict Mathematics self-concept (fathers were not).

4.7. Teaching Styles’ Effects on Social and Academic Self-Concept. Similar to their positive indirect effects on mathematics achievement, authoritative and authoritarian mathematics teachers positively and directly predicted mathematics self-concept. The positive effects of Omani authoritative teachers on academic (i.e., English) self-concept were also found by Alrajhi and Aldhafri [55]. However, unlike the current study, Alrajhi and Aldhafri [55] found no effects of authoritarian teaching on English self-concept. It should be noted that effects may be dependent on the subject matter studied. Having authoritarian mathematics teachers might be more acceptable among students and have a more positive impact on mathematics self-concept when compared to authoritarian English language teachers.

5. Conclusion

In conclusion, our findings extend previous research on the important role of parenting and teaching styles in the children’s outcomes. Academic and social variables were found to have different impacts on student achievement. The current study supported the proposed model of the direct and indirect, through self-concept, effects of parenting, and teaching styles on students’ academic achievement. It also sheds the light over the differentiating effects of mothers and fathers by examining maternal styles separately from father styles as recommended by early research [9, 11, 79]. Indeed, mothers appeared to have greater effects through their parenting styles than fathers did, and teachers were shown to influence their students’ outcomes through their various teaching styles. Also, mathematics self-concept was an important predictor and a mediator of Mathematics achievement. The cumulative evidence of the effects of parenting styles on students’ achievement should encourage educators to develop parenting programs and interventions that promote authoritative parenting style (rather than permissive parenting style) as a means to increase students’ academic achievement.

Moreover, school teachers must be trained, through teacher preparation programs and workshops, to adopt the authoritative teaching styles more than the permissive and authoritarian teaching styles due to its significant roles on reinforcing students’ Mathematics self-concept and Mathematics achievement.

The positive effects of authoritative teaching would be most probably apparent in other school subjects as well. In addition, teachers need to be aware about the nature of their school subjects and decide which teaching styles fit better. For instance, although the current study showed positive indirect effects of authoritarian teaching on Mathematics achievement through Mathematics self-concept, the same positive effects might not be valid in other school subjects. Students in classes of subjects like art, language, physical activity, and others would be more engaged and interested when school teachers used less demanding style, such as the authoritative or, in rare cases, the permissive style.

These findings should be of interest to researchers looking at students’ academic achievement across cultures. The results reported here came from an underrepresented culture in the research of parenting and teaching styles, as well as self-concept and mathematics achievement. The pattern of direct and indirect effects may reflect specific aspects of the Omani culture (as a collective culture) that needs further examination using a cross-cultural design. Particularly, the important role of mothers’ parenting styles (compared to fathers’ styles) uncovered in this study need to be examined using samples from different cultural backgrounds. In addition, it is not clear from our model whether these patterns of effects vary across different school subjects. The percentage of variance explained in students’ Mathematics achievement by our model indicates that there are other unexamined variables that may contribute to the development of students’ achievement.

Comparing more than one subject and incorporating other motivational constructs such as self-regulated learning skills, academic self-efficacy beliefs, learning motivation, personality, intelligence and parental involvement, beliefs, perceptions, religions, and the degree of acculturation may give a deeper understanding of how school, family, and personal characteristics interact with each other to influence students’ academic achievement. Integrating a moderator and a mediational model may allow to understand how these correlates may vary across some demographic and educational variables that are related to the children, the parents, and/or the teachers.

Data Availability

The dataset can be provided upon request.

Additional Points

Limitations. Although the current study used path analysis to examine the relationships between the study variables, it is still a correlational design that has utilized a cross-sectional design. Using an experimental design along with a longitudinal design may provide a better understanding of the effects of parents’ and teachers’ styles and self-concept on math achievement. In addition, this research depended on participants’ self-reports, which might be influenced by social desirability. However, the researchers’ efforts in ensuring confidentiality and anonymity while collecting data should have hopefully minimized such limitations. Previous research argued about the plausibility of using self-reported grades as accepted

indicators of the actual students' performance [11]. The current study is also limited in terms of its sampling method. The researchers collected data from only three school districts which may not allow to generalize the findings at the nation level. A larger representative national sample with a longitudinal design may give a better understanding of the interrelations among social and school variables and children's outcomes.

Conflicts of Interest

No potential conflicts of interest were reported by the authors.

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