

Perceived Parental Support as a Predictor of Student Achievement: A Cross-National Analysis of PISA 2022 Data

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ABSTRACT: The family environment is considered a critical factor in explaining achievement disparities in international student assessments. Investigating whether the quality of parental support is associated with student achievement across diverse socio-cultural contexts could create opportunities for developing effective educational policies. This study aims to examine, using the PISA 2022 dataset, whether perceived parental support among 15-year-old students predicts their achievement in Mathematics, Science, and Reading. The study employs a correlational research design, a method suitable for examining relationships and predictions. PISA 2022 student data from a diverse set of countries representing various levels of achievement and socio-cultural backgrounds were utilized, including Brazil, Costa Rica, Hong Kong, Hungary, Ireland, Macao, Mexico, the Netherlands, New Zealand, Panama, Saudi Arabia, Slovenia, Spain, and the UAE. Perceived parental support was measured using eight sub-items from question ST163, located within the well-being section of the student questionnaire. Data analysis was conducted using the IEA IDB Analyzer, a program designed for PISA data and run via the PISA 2022 SPSS data file. To analyze achievement in Mathematics, Science, and Reading, all ten Plausible Values (PVs) for each domain were utilized along with the final student weight variable (W_FSTUWT). Multiple linear regression analysis was performed to examine the predictive relationships. The results of the analysis reveal that the dimensions of parental support examined show statistically significant relationships with achievement in all three PISA domains: Mathematics, Science, and Reading. Supportive parental approaches—such as helping with schoolwork, showing interest, allowing students to do things they enjoy, and encouraging them to make their own decisions—were found to be positive predictors of achievement in Mathematics, Science, and Reading. Conversely, parental approaches that were overly controlling or infantilizing were identified as negative predictors of achievement in all three domains. Furthermore, a noteworthy finding was that parental efforts to understand their child's problems and to improve the student's morale were also found to be negative predictors of achievement across all three core PISA domains. In conclusion, based on a participant group from diverse international and socio-cultural backgrounds, this study confirms that perceived parental support is a significant determinant of student achievement in Mathematics, Science, and Reading.

KEYWORDS: Parental Support, Academic Achievement, Student Achievement, PISA, Cross-National Analysis.

I. INTRODUCTION

International Large-Scale Assessments (ILSAs), among them the well-known Programme for International Student Assessment (PISA), have become the cornerstones of metamorphosing education worldwide while facilitating comparative evaluations of different educational systems. The essence of PISA eludes in its ability to not only measure the fundamental worth of the knowledge participants possess but also evaluate the young generation's 21st-century skills like problem-solving, critical thinking, and capacity to operate with efficiency and ease in today's complicated world (Rutkowski et al., 2020; Perry & Ercikan, 2015). The outline of systematic differences in achievements for students represented in PISA results show that these particular outcomes might be a result of a complex interplay that may involve different social, economic, and educational factors instead of being the result of one specific factor. Therefore an extensive recognition of these variables and their relationship to education, for instance, as it pertains to learners' socio-economic status (SES), school climate, and family environment, is necessary in order to achieve educational reforms that will result in improved outcomes, if it is to succeed in any way at all (Amir et al., 2023; Chmielewski, 2019). The existing mean level challenges are universal and therefore should also be adopted in other countries as they present a very good comparison point for uniform tension therapy that brings a standard transformation in models. However PISA continues acquiring more and more meanings since it transports alliances of diversified discussions that

Perceived Parental Support as a Predictor of Student Achievement: A Cross-National Analysis of PISA 2022 Data

serve to know about education that debates engagement within the global education community, hence bringing more people into the open internationally and also undertaking it with diverse nationalities at different levels.

In numerous studies, the role of socio-economic status has always been one of the strongest predictors of student achievement in school (Chmielewski, 2019; Braun and Singer, 2019). Data from PISA clearly shows that the lower SES achievement gaps among students are the main realm in which cognitive competences have become one of the cornerstones of educational stratification. Those students whose parents are content with their lives since they earn enough money to lead a happy life normally possess more resources and greater opportunities for succeeding in school (Chmielewski, 2019). Another large factor influences such students in the opposite direction. According to Perry and Ercikan (2015) and Steinmann and Olsen (2022), positive school level processes such as school culture and disciplinary actions impact the rate of student achievement considerably. Schools with a well-formulated feeling of belonging and inclusive discipline can minimize inequity and disproportion in student results. Consequently, if the environment in which students learn could be improved, attendance at such school campuses might significantly reduce the disadvantage stemming from low SES. This also proves once again that countries should place their focus on this area when embarking on the path of eventual improvements in education that can increase the prospects and opportunities of students.

Two other major criteria that people do not seem to understand the significance of are the family environment and the involvement of parents which play a very important role in the success of students academically speaking. The social and cultural capital in the form of parental expectations and active engagement in education are therefore aspects that improve the performance of students. Research conducted by Amir et al. in (2023) and Rudd et al. in (2022) suggests a significant correlation concerning the parental role and the academic achievement of children. These citing authors indicate that when parents create an environment that is conducive to optimal growth and academic progress in particular, they foster the possibility of increased performance as far as assessments such as the PISA (Rudd et al. 2022, Rutkowski et al. 2018). Nevertheless, existing scholarly literature indicates that there is still a big gap in the level of understanding that is required to understand how parental support varies and affects families from different socio-cultural background groups and more so how it can affect children's higher-order cognitive capabilities as measured by ILSA. (Teig & Steinmann, 2023) say that this fact helps to put to good use the large data from the Program for International Student Assessment to go deep into these issues hence encouraging the government and well-organized plans to help with the understanding of parent practices in fostering and assisting an education system that is fair and has equality in opportunities for learning.

In conclusion, the intricate play of socio-economic influences, the various school environments, and the many family circumstances might have an influence on the performance of students on assessments such as PISA. Despite the fact that ILSAs offer substantial clues to existing trends, particularly with regard to inequality in student performance, there is a significant lack of information regarding the underlying factors at play.

The analysis of the potential influence of insufficing of family support on students' testing performance in international assessments such as the Programme for International Student Assessment (PISA) can be guided by diverse well-established theoretical frameworks. Each of these frameworks provides a deep insight into how family structure and support can positively attribute to students' educational outcome. As such, family support and proper family structure can be used as tools for improving the academic performance of students on standardized tests such as PISA.

Ecological Systems Theory posited by Urie Bronfenbrenner (1979) acts as the fundamental point of view for considering that child development is embedded in exchanges within the surrounding environment or microsystem. The family unit acts as the most basic and influential microsystem, where positive family dynamics such as encouragement can have a strengthening impact on cognitive and social growth thus improving academic performance. Particularly, when the family can create a supportive environment or climate by offering counseling and assistance, academic success can be achieved through tapping into the basic potential of the child (Aprilianata et al., 2025; Crawford, 2020). As interactions and relationships within this microsystem are important, Bronfenbrenner recognizes that if a child grows up in a positive environment with a thriving family relationship, they have a higher likelihood of enjoying better developmental outcomes (Aprilianata et al., 2025).

Social Capital Theory emphasizes that strong family ties, involvement, and expectations serve to create a climate that is conducive to learning and improves student performance. In Coleman's (1988,1990) view of social capital, parents who present sound family relationship networks provide emotional and cognitive resources which students need to successfully operate in academic settings (Crawford, 2020; Carmona-Halty et al., 2020). In this regard, if parents show active involvement in their children's academic lives either by being involved in the school or developing a learning culture at home the represented social capital enhances the students, thus positively affecting their academic achievement (Carmona -Halty et al., 2020). Therefore, through using the available family capacity, the expectation of success is normally raised in addition to increasing the process of learning by children.

To sum up, analyzing the effect of family support on intelligent pupils' testing success in terms of PISA single evaluation methodology can best be explained using different theoretical frameworks. Bronfenbrenner's Ecological Systems Theory – is an essential theory as it states that the family is a basic ecosystem where quality support in terms of positive relationships improves

Perceived Parental Support as a Predictor of Student Achievement: A Cross-National Analysis of PISA 2022 Data

a child's overall development. Besides, the well-respected Social Capital Theory clarifies that supportive families help to create an environment that promotes educational success, affecting students positively and giving them the necessary means to achieve academic results. Overall, education is a complex field that needs to be expressed in its broad essence and its structure of relationships. Hence, national education systems, including those in the case of the said PISA, should aim at empowering families so

Integrating insights from Self-Determination Theory further elaborates on the inner working successful autonomic processes that lead to high academic achievement among the children of the middle and the high school students, together with the college students and for the children from any cultural background. Ryan and Deci (2000) argue that autonomy-supportive parenting that entails accepting children's views and encouraging them to make choices for themselves uniquely promotes intrinsic motivation as it once happened in the case of Zhong et al. (2025). This support can remarkably enhance students' engagement in ongoing learning processes that are indispensable for success on PISA, which requires a lot of higher-order thinking and excellent problem-solving skills among students and in turn leads to better successes in the assessments. However, the status of motivation in the education of children with different disadvantages has been ignored in some previous researches in spite of being a very important aspect of their academic success as to learning, but also to realizing their unique psychological and social needs after all.

Expectancy-Value Theory (Eccles et al. 1983), on the other hand, provides a complementary position by examining the ways in which parental beliefs regarding their children's abilities shape students' expectations and value for academic tasks. When parents write/write&rsign expectations, children also appear to learn and truly believe that they are capable and effective persons, themselves referred to as having high self-efficacy and extremely high degrees of resilience which are two important attributes that correlate with success in standardized assessments like the PISA scale (Kurland & Siegel, 2013; . This might translate to numerous and improved efforts when trying to perform difficult tasks or dealing with sensitive situations in their studies, which has a direct effect on the children's performance. Parental involvement is also described as a process of transformational leadership that emphasizes the development of a parental belief in education, the development of students' self-assertiveness and the establishment of an educational milieu that embraces all these aspects and is encouraging.

Attachment Theory, developed by Bowlby (1958, 1969) associates itself with the emotional perspectives of bonding between children and their caretakers from those moments of pregnancy up to the end of the first year of life. Secure attachments allow children to explore and create positive coping strategies when confronted with new challenges (Kurland & Siegel, 2013; Castro & Pereira, 2019). Children who perceive their parents as a "secure base" are motivated to engage in learning confidently, thus enjoying an environment where they are more likely to experience success in various academic areas and this translates to better performance in the assessments. The emotional security provided in the context of a favorable family situation has been associated with higher self-esteem besides as well as better problem-solving abilities, both of which are essential for success in cognitive assessments, especially as seen in the light of the PISA results (Castro & Pereira, 2019).

Vygotsky's (1962) Sociocultural Theory of Development fits perfectly within these frameworks by underlining the significant role of social interactions in influencing a child's cognitive development. In light of this, he put forth the argument regarding the presence of "More Knowledgeable Others" and the significance of scaffolding where he was highly against the viewpoint of Cultural and Social Context Theory. However, he advocated that engaging parents in academic endeavors aids their children's passage through the Zone of Proximal Development (ZPD). The interaction with the More Knowledgeable Others is particularly crucial in learning the hard thinking skills which are evaluated by the PISA instruments because parental guidance can assist the children in encountering problematic school work (Zhong et al., 2025). All in all, authors like Vygotsky view the role of the More Knowledgeable Others in education as being extremely vital because the onus of the development of the child's mind lies with them.

Finally, Bandura's Social Cognitive Theory (1977,1986,1997) provided empirical evidence that parental support plays a significant role in building students' self-efficacy, which is the belief in one's abilities to accomplish certain tasks. Bandura argued that the parents who have enough positive influence on their children through encouragement and mastery can help to boost their academic confidence. Such can include encouragement and getting mastery experiences which increase children's belief in their academic odds (Masisi, 2024; Zhong et al., 2025). The challenge of building self-efficacy comes as an essential factor when taking part in a PISA-type assessment as this is a test that requires for students to put their knowledge and skill in the classroom in use under pressure.

In conclusion, the various theories examined in this paper have clearly demonstrated that family support plays a far-reaching role in helping learners to attain academic excellence in school or in other educational institutions. The Ecological Systems Theory in this context provides an elaborate analysis of the interactions that take place in the family setting and the effect they have on shaping the learning experiences of students. The Social Capital, Self-Determination, Expectancy-Value, and Attachment Theories offer valuable insights into the specific scenarios and issues that enhance the academic performance of students in a learning environment. Though different, these theoretical frameworks position family support as a major resource in the area of education as opposed to being a peripheral factor that may be considered as nice to have. Family support emerges

Perceived Parental Support as a Predictor of Student Achievement: A Cross-National Analysis of PISA 2022 Data

as an utmost critical societal resource for improving student outcomes and performance, especially in the context of various standardized evaluation processes like PISA. This paper has shown that providing effective family support is a sterling investment in the overall educational growth of the children and should strive to be an all-round effort for the holistic development of every child.

When considered collectively, these theories provide a robust theoretical foundation for the proposition that family support can significantly influence student academic performance on PISA. This influence is proposed to operate through various mechanisms, including shaping the developmental environment, providing social resources, enhancing intrinsic motivation, and fostering positive beliefs about success.

Stemming from the problem statement and the comprehensive theoretical analysis, the primary aim of this research is therefore defined as follows:

The main purpose of this study is to determine the extent to which the perceived levels of parental support predict the PISA achievement of 15-year-old students in the domains of Mathematics, Science, and Reading. This investigation will be conducted using data from the PISA 2022 cycle, allowing for an analysis across diverse sociocultural contexts.

II. METHOD

A. Research Design

This research employs a correlational methodology designed to investigate the associations among variables and their capacity for prediction. The central aim is to ascertain how effectively predictor variables, exemplified by perceived parental support, account for the outcome variables: student performance scores in PISA 2022 Mathematics, Science, and Reading Literacy. Such a research model is focused on identifying relationships between variables as they naturally occur and on forecasting outcomes from a given set of predictors.

B. Participants

The sample for this research was drawn from the public dataset of the 2022 cycle of the Programme for International Student Assessment (PISA), an initiative administered by the Organisation for Economic Co-operation and Development (OECD). PISA utilizes a standardized methodology to assess the competencies of 15-year-old students across various domains, ensuring comparable data through rigorous sampling procedures in each participating economy.

The present study focuses on a specific cohort within the PISA 2022 data. The participants are 15-year-old students from 14 countries, selected to ensure representation across a spectrum of academic performance levels and diverse socio-cultural contexts. The countries included in this study are Brazil, Costa Rica, Hong Kong, Hungary, Ireland, Macao, Mexico, the Netherlands, New Zealand, Panama, Saudi Arabia, Slovenia, Spain, and the United Arab Emirates.

C. Data Collection Instruments

This study utilized data collected within the framework of the Programme for International Student Assessment (PISA) 2022, conducted by the Organisation for Economic Co-operation and Development (OECD). The OECD makes the rich datasets from international assessment programs like PISA accessible to researchers worldwide to promote scientific research in education. Accordingly, this study was conducted using the official PISA 2022 data files provided to researchers.

The PISA data collection instruments are standardized measures whose validity and reliability have been rigorously established at an international level. Data for the variables of this research were obtained through the following instruments:

PISA 2022 Student Questionnaire:

Perceived Parental Support: To measure students' perceived parental support, 8 sub-questions from question 163 within the "Well-being" module of the PISA 2022 student questionnaire were used. These sub-questions are designed to determine student perceptions of different supportive or controlling behaviors from their parents.

PISA 2022 Cognitive Achievement Tests:

Mathematics Achievement: The PISA 2022 Mathematics test was used to determine students' mathematical literacy levels.

Science Achievement: The PISA 2022 Science test was used to measure students' scientific literacy levels.

Reading Skills Achievement: The PISA 2022 Reading test was used to assess students' reading literacy levels.

For all three achievement domains, 10 different Plausible Values (PVs) calculated by PISA were used in the analyses. These values allow for a reliable estimation of students' proficiency levels in the respective domains.

D. Data Analysis

The analysis of the data collected for this study was conducted using statistical procedures appropriate for the characteristics of large-scale and structurally complex datasets such as PISA. Specifically, all analyses were performed using the IEA IDB Analyzer software, operated through the PISA 2022 SPSS data file. This software, developed by the International Association for the Evaluation of Educational Achievement (IEA), is designed to ensure the correct application of analytical procedures that account for PISA's complex sampling design and the use of plausible values (PVs).

Perceived Parental Support as a Predictor of Student Achievement: A Cross-National Analysis of PISA 2022 Data

To represent student proficiency in Mathematics, Science, and Reading Skills, all ten Plausible Values provided by PISA for each assessment domain were incorporated into the analyses. This comprehensive approach is essential for minimizing measurement error and yielding more reliable and accurate results. Furthermore, to ensure that the sample accurately represents the corresponding population, the student weight variable (W_FSTUWT) included in the PISA 2022 dataset was applied in all calculations.

To address the primary research objective—examining the degree to which perceived parental support predicts PISA achievement—multiple linear regression analysis was employed. This statistical method was used to investigate the individual and combined effects of the parental support sub-dimensions (predictor variables) on achievement in Mathematics, Science, and Reading (criterion variables). Through this analysis, the statistical significance of these predictive relationships was thoroughly tested.

III. FINDINGS

This section presents the results of a multiple linear regression analysis examining the extent to which dimensions of perceived parental support predict student achievement in Science, Mathematics, and Reading. The analysis is based on the aggregated data of PISA 2022 students across 14 countries.

The predictor variables, representing the dimensions of parental support, are as follows:

V1 (Instrumental Support): Parents helping me when I need it.

V2 (Permissiveness/Granting Autonomy): Parents letting me do the things I like.

V3 (Demonstrating Interest): Parents showing they are interested in me.

V4 (Empathetic Understanding): Parents trying to understand my problems and worries.

V5 (Encouraging Autonomy): Parents encouraging me to make my own decisions.

V6 (Overcontrol): Parents trying to control everything I do.

V7 (Infantilization): Parents treating me like a baby.

V8 (Mood Improvement): Parents cheering me up when I am sad.

A. Predicting PISA 2022 Science Achievement from Parental Support (Aggregate Results)

TABLE 1 MULTIPLE REGRESSION ANALYSIS PREDICTING SCIENCE ACHIEVEMENT FROM PARENTAL SUPPORT DIMENSIONS (AGGREGATE RESULTS)

Predictor variables	<i>B</i>	<i>SE</i>	β	<i>t</i>
V1	14.36	0.95	.10	15.09***
V2	12.73	0.91	.08	13.98***
V3	13.91	1.11	.09	12.52***
V4	-11.66	0.94	-.09	-12.43***
V5	8.66	0.89	.07	9.74***
V6	-15.16	0.58	-.12	-26.03***
V7	-12.42	0.64	-.10	-19.49***
V8	-11.42	0.75	-.09	-15.31***

Note. *B* = Unstandardized regression coefficient; *SE* = Standard error; β = Standardized regression coefficient. *** $p < .001$. Results reflect the average across 14 countries.

The multiple linear regression analysis revealed several significant predictors of Science achievement. The findings indicate a nuanced relationship between specific parental support behaviors and student performance.

Four dimensions of parental support emerged as positive and significant predictors. The most potent positive influence was Instrumental Support (V1: Parents helping me when I need it), which was the strongest predictor of higher science scores ($\beta = .10$, $p < .001$). This suggests that direct, task-oriented assistance from parents is robustly associated with better academic outcomes in science. Furthermore, parental behaviors that foster student autonomy were also beneficial. These included Permissiveness (V2: Parents letting me do the things I like) and Encouraging Autonomy (V5: Parents encouraging me to make my own decisions), both of which positively predicted achievement. Finally, Demonstrating Interest (V3: Parents showing they are interested in me) was also a significant positive predictor, underscoring the value of perceived parental engagement.

Conversely, the analysis identified four parental behaviors that negatively predicted Science achievement. The most substantial negative predictor was Overcontrol (V6: Parents trying to control everything I do), with the strongest negative effect ($\beta = -.12$, $p < .001$). This result strongly suggests that parental behaviors perceived as excessively controlling or intrusive are

Perceived Parental Support as a Predictor of Student Achievement: A Cross-National Analysis of PISA 2022 Data

detrimental to students' science performance. Similarly, Infantilization (V7: Parents treating me like a baby) was also associated with lower scores.

Interestingly, and perhaps counterintuitively, two other supportive behaviors were also found to be negative predictors: Empathetic Understanding (V4: Parents trying to understand my problems and worries) and Mood Improvement (V8: Parents cheering me up when I am sad). While these actions are ostensibly positive, their negative association with achievement suggests a complex dynamic. It is plausible that the frequent need for such interventions correlates with underlying emotional or academic difficulties that also hinder performance. In other words, these parental actions may be a *response* to a student's pre-existing struggles rather than a cause of them.

B. Predicting PISA 2022 Mathematics Achievement from Parental Support (Aggregate Results)

TABLE 2 MULTIPLE REGRESSION ANALYSIS PREDICTING MATHEMATICS ACHIEVEMENT FROM PARENTAL SUPPORT DIMENSIONS (AGGREGATE RESULTS)

Predictor variables	<i>B</i>	<i>SE</i>	β	<i>t</i>
V1	12.80	0.87	.09	14.71***
V2	11.68	0.85	.08	13.77***
V3	12.35	0.99	.08	12.50***
V4	-8.23	0.87	-.07	-9.51***
V5	7.50	0.80	.07	9.35***
V6	-13.17	0.51	-.12	-25.71***
V7	-11.12	0.59	-.09	-18.97***
V8	-9.52	0.70	-.08	-13.57***

Note. *B* = Unstandardized regression coefficient; *SE* = Standard error; β = Standardized regression coefficient. *** $p < .001$. Results reflect the average across 14 countries.

A similar pattern of findings was observed for Mathematics achievement. The analysis revealed that supportive and autonomy-promoting parental behaviors were positively associated with higher scores. Specifically, providing instrumental help when needed (V1), demonstrating interest in the child's activities (V3), allowing the child to pursue their interests (V2), and encouraging autonomous decision-making (V5) all emerged as significant positive predictors. Among these supportive behaviors, 'Parental Help' (V1) exerted the strongest positive influence on Mathematics achievement ($\beta = .09, p < .001$).

In contrast, several parental behaviors predicted lower Mathematics achievement. Behaviors indicative of psychological control, namely 'Overcontrol' (V6) and 'Infantilization' (V7), were significant negative predictors. Notably, 'Overcontrol' was the most potent negative predictor in the model, demonstrating the largest adverse effect on student scores ($\beta = -.12, p < .001$). Interestingly, parental actions that might be considered supportive on the surface—such as 'Attempting to Understand Problems' (V4) and 'Mood Improvement' (V8)—were also found to be statistically significant negative predictors. This counterintuitive finding suggests that, from the adolescent's perspective, these forms of engagement may be perceived as intrusive or may undermine the student's sense of competence, thereby negatively impacting their performance in a demanding subject like Mathematics.

C. Predicting PISA 2022 Reading Achievement from Parental Support (Aggregate Results)

TABLE 3 MULTIPLE REGRESSION ANALYSIS PREDICTING READING ACHIEVEMENT FROM PARENTAL SUPPORT DIMENSIONS (AGGREGATE RESULTS)

Predictor variables	<i>B</i>	<i>SE</i>	β	<i>t</i>
V1	17.33	1.03	.11	16.86***
V2	14.98	0.93	.09	16.12***
V3	18.02	1.14	.11	15.76***
V4	-15.79	1.01	-.11	-15.70***
V5	10.88	0.94	.08	11.57***
V6	-16.22	0.61	-.13	-26.67***
V7	-13.94	0.64	-.10	-21.81***

Perceived Parental Support as a Predictor of Student Achievement: A Cross-National Analysis of PISA 2022 Data

V8	-11.98	0.80	-.09	-14.92***
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Note. B = Unstandardized regression coefficient; SE = Standard error; β = Standardized regression coefficient. *** $p < .001$. Results reflect the average across 14 countries.

The analysis of Reading Skills achievement revealed a pattern of results consistent with the other academic domains. Among the supportive parental behaviors, Instrumental Support (V1) and Demonstrating Interest (V3) emerged as the most influential positive predictors, both exerting an equally strong influence on student scores ($\beta = 0.11$). Furthermore, parental behaviors that foster student autonomy, specifically Permissiveness (V2) and Encouraging Autonomy (V5), were also found to be statistically significant positive predictors of higher achievement in reading.

Conversely, several perceived parental behaviors were associated with lower reading performance. Overcontrol (V6) was identified as the most substantial negative predictor ($\beta = -0.13$), indicating that intrusive parental monitoring is particularly detrimental to reading skills. Moreover, Infantilization (V7) was also a significant negative predictor. Notably, and perhaps counter-intuitively, two variables typically considered positive—Empathetic Understanding (V4) and Mood Improvement (V8)—also emerged as significant negative predictors of Reading Skills achievement in this model.

IV. DISCUSSION

The findings of this study offer a nuanced perspective on the multifaceted nature of parental support and its relationship with adolescent academic achievement on the PISA assessment. The results clearly delineate between parental behaviors that foster success and those, including some well-intentioned actions, that are associated with poorer outcomes. This discussion synthesizes these findings, linking them to established theoretical frameworks and exploring their practical implications.

A. Positive Predictors: The Symbiotic Relationship of Support and Autonomy

The results of the investigation uncover that a nurturing disposition in parents, combined with a hands-off autonomy intent, serve as the most crucial determinants in achieving top rankings across the Science, Math, and Reading PISA areas. The way parents communicate with their children, in terms of extending help whenever they show signs of lack of understanding, genuinely showing interest in what the children do, allowing time for children to freely engage in what they love and encouraging some kind of independent decision making among the children so that they can cultivate a good and conducive study atmosphere, is seen to be instilling such an attitude as would improve the students performance in the various tests covered under the PISA. This situation again echoes the underlying concepts of the Self-Determination Theory (SDT), which emphasizes the significance of satisfying basic psychological needs of people parenting according to the principles of SDT such as autonomy, competence, and relatedness are essential within the period of adolescent growth (Zou, 2022; Teuber et al., 2022).

Essentially, by offering support to their children, parents in one way or the other fulfill these fundamental needs which result in a feeling of accomplishment, and hence engender a sense of intrinsic motivation among the children (Jang & Youngmeen, 2021; Teuber et al., 2022). Research evidence suggests that teenagers who have high autonomy and development of their competence exhibit high levels of motivation toward achieving their learning goals, a more positive attitude towards facing challenges, and a greater retention rate in school (Werang et al., 2024; Teuber et al., 2022). A good example of this can be seen in the cases of children receiving active support from their parents in the form of emotional encouragement or various forms of help. Such support creates a picture where all that is feared about the education stops being a hindrance to educational activities, and the need and desire for the knowledge acquisition among students are nurtured to the maximum possible extent (Teuber et al., 2022; Werang et al., 2024). As far as PISA-tests are concerned, here the students being supported by their parents learn to solve problems whilst also acquiring a good sense of responsibility; these qualities are indeed useful because this test focuses on the use of knowledge in practical situations whereas rote learning is reduced to the minimum (Zou, 2022; Teuber et al., 2022).

Furthermore, it is very important to understand that the impact of parents on their children's learning and development differs depending on the level of education that the child is at. In their research, Vasquez and his colleagues agreed that the positive and productive parenting that parents offer their middle and high school students has greater influence over their academic performance than that given to their elementary school kids (Zou, 2022). This shows that when it comes to parental support, the teenage children have different expectations and these require different methods of meeting their needs. According to the current research, parental autonomy support permeating both parents, rather than one parent alone, was shown to influence the academic performance of the children positively and beneficially (Zou, 2022; Nyarko, 2011; Ishak et al., 2011). These studies provide further support for the idea that attribution of learning and academic success does indeed require cooperation from both parents but not just one of them.

The synthesis of findings from various studies strongly supports the assertion that supportive and autonomy-oriented parenting significantly enhances adolescents' feelings of competence and autonomy, ultimately leading to superior academic performance across critical domains. Besides the parents' support, the involvement of the students themselves along with their motivation to learn need to be integrated in the study of academic success and, therefore, the family context has to be taken into

Perceived Parental Support as a Predictor of Student Achievement: A Cross-National Analysis of PISA 2022 Data

consideration. The use of a variety of interventions and active engagement of both adolescents and their parents would create a conducive environment for learning and motivation for success in school. Henceforth, it is necessary to comprehend that through the concerted efforts of parents, their children and teachers in a close relationship, and the academic success of adolescents can be achieved as a goal that parents work hard to achieve (Werang et al., 2024; Jang & Youngmeen, 2021; Mondal & Bhowmick, 2024). Specific implementations designed to maximize the occurrence of positive and productive parenting together with quantitative involvement from the students are recommended in order to enhance the performance of the adolescents in their learning.

B. Expected Negative Predictors: The Detriment of Control and Developmental Mismatch

The findings that excessively controlling or infantilizing parental behaviors negatively affect achievement in adolescents are well documented in developmental psychology, and the knowledge within the psychological field demonstrates the significant influence that parents have on the development of their offspring. Specifically, it has been concluded that excessive control by parents will not assist adolescents in achieving their goals however rather it would be detrimental since this is the stage in which children are supposed to become independent and achieve desirable outcomes in life; thus these behaviors do not meet the real developmental needs of these adolescents. This transition towards independence, the ability to be self-determined, and the formation of identity generally implies adolescents' rights to liberate themselves so that they are able to be motivated to move towards accomplishing their set goals in both academic and personal spheres. During this transitional developmental stage, most particularly the period of adolescence, it is critical that a person is able to clearly have a sense of being independent if they are to be able to achieve milestones with respect to academic success and personal development. However, in cases where there is excessive parental control, the entire process of development may be hindered in that, it interferes with adolescents' ability to take control over their lives and to make some wise decisions that would lead to prosperity as well as achievement in their studies and overall development (Fu et al., 2022; , Yomtov et al., 2015).

On further research/proper observation, it becomes clear that overly protective parents and controlling forms of parenting can further decrease opportunities for adolescents where specifically they could be engaging in self-discovery through activities such as self-expressions and healthy risk taking which will help them develop and grow as individuals and also in school. In this context, it seems that when parents impose psychological control rather than providing emotional warmth and acceptance, it leads to an intrinsic demotivation process among adolescents who try to adjust according to their parents' pressures hence not being able to develop a sense of self-motivation. To illustrate, it has been established that parental psychological control is inversely related with self-efficacy implying that adolescents subjected under strict control fail to act according to what they believe they can do and are made to pursue conformity rather than being themselves (Fatemi et al., 2024). This means that, the very reality of this dynamic is that, adolescents can hardly work and be responsible for their learning while being getting constrained and controlled in this manner, which is not truly achieving the developmental task of gaining independence from their parents (Dong, 2023). Furthermore, the inability of these adolescents to develop essential skills that are

Furthermore, the negative effects of over-controlling parents go beyond short-term academic achievement and affect long-term self-competence in their abilities and reduction in personal drive. Adolescents brought up in controlling environments are likely to become dependent on others for recognition and validation when it comes to achieving particular tasks, which can limit their capability to solve problems on their own as well as defend themselves and be resilient in the face of challenging situations (Coleman & Karraker, 2003). In this regard, studies have discovered that parents with low parenting self-efficacy create a devaluating environment then classified by repeated criticism and comparison and as a result, these negatively impact the self-esteem and self-efficacy of adolescents which could lead to anxiety and decreased performance due to losing the ability to carry out things themselves (Liu et al., 2022). Therefore, parenting styles that subvert the developmental needs of teenagers can hinder their course towards academic excellence and self-fulfillment.

In brief, the available proof reinforces the idea that controlling and overaffectionate forms of parenting during adolescence are not only undesirable but also adverse. A nurturing and steady parenting style is required to enable positive growth in adolescents, the development of autonomy and the growth of self-efficacy, which is essential for succeeding in academic, personal, and social contexts of life. Parents are encouraged to allow their youngsters to learn from their mistakes while giving them freedom of choice and opportunities to develop their potentials, reactions as well as establish trust in themselves and feelings of competency.

C. Unexpected Negative Predictors: The Paradox of Well-Intentioned Support

When it comes to understanding the relationships between different behaviors of parents that mean trying to understand what issues their children are dealing with and making them feel better and their corresponding performance in a specific standardized testing agency known as the Programme for International Student Assessment, it is evident that a very convoluted psychological framework is revealed that calls for a thorough and deeper inquiry. The results that have been found for the survey suggest that even though parental involvement is generally perceived as being beneficial for children's academic and social needs, there are

Perceived Parental Support as a Predictor of Student Achievement: A Cross-National Analysis of PISA 2022 Data

some instances when this involvement could be negative. These negative reactions could result from a mismatch between the requirements of the children in terms of the behaviors of the parents and the actual characteristics of the children.

This great paradox that exists, however, appears to be explicable through a very interesting and perplexing aspect of the phenomena that has been investigated, which is that of directionality in the relationships that have been found. It is also appropriate to note that the behaviors of parents, which are associated with trying to understand the problems of children and help them feel better, could be seen as reactions to the problems of the children in existence rather as something that causes children to perform poorly in assessments. It is a common notion that when children have some difficulties in their studies, on the social front, on the emotional front, or even all three, it is the parents that tend to become more cognizant and more actively participate in their schooling which in unto itself could mean that there are already problems at hand that may be faking the PISA output (Shala & Grajcevcic, 2018). Therefore, instead of causing low achievement, parental care could be a consequence of the failure of children, leading to a misunderstanding about intelligence.

Another factor that may be vital for understanding the nature of parental involvement is the quality of the actions and participation of the parents concerned. Since it is possible to say that those behaviors that have been carried out with the best of intentions, such as parents arguing with their children or showing them emotional support, could in fact lead to the raising of negative consequences due to a lack of thorough execution and planning. In settings where parents repeatedly dwell on stuff like negative feelings without making any real efforts at solution-finding which would positively impact the growth of children, these high levels of awareness could lead to strong feelings of helplessness in children (Tang & Tran, 2023). As the cycles of negative thinking and communication get longer, children become less capable of thinking critically, creating solutions, or failing as a result of their learning. Over-involvement is seen as indicative of parents telling their adolescent children that they lack the capacity to deal with their issues; thus, that the confidence levels of the adolescents and their sense of independence are greatly weakened and, at some point, they would feel like they are failures anyways (Wang & Li, 2024). This means that if parents are supportive but at the same time enabling, it can negatively affect the children's abilities of self-determination.

Additionally, heightening anxiety can derive from heightened parents' focus on children's emotional states and problem-solving processes, sometimes leaving a feeling of pressure on the children that they need to meet the parents' expectations or ease their worries (Shute et al., 2011). This invisible pressure may impair children's academic orientations, leading to a shift from an understanding and a growing interest-based mind-set that stresses acquiring knowledge and improving oneself, to an avoidance-performance focus that intends to deal with a sense of anticipated failure and disappointment of their parents (Shala et al., 2021). An explanation concerning the management of emotional environments may lead to heightened pressure and stress, and as various studies show this is dramatically linked with a decline in children's cognitive performance in school (Schmidt et al., 2020).

In conclusion, it should be noted that even as parental involvement is mostly linked with beneficial academic results for children in school; this connection is affected by the exact involvement structure and the emotional context in which it happens. The knowledge of the two-phase effects of parents' actions on academic achievement can help in shaping the climate in effective parenting and education, hence ensuring that they contribute to a child's learning (Kumlu & Doğan, 2020).

V. CONCLUSIONS

Synthesizing the results of this investigation leads to a clear and compelling conclusion: the efficacy of parental support in predicting academic success is not a simple matter of presence or absence, but a complex interplay of type, timing, and execution. The evidence strongly supports a model where parental actions that nurture a child's sense of autonomy and competence within a supportive framework yield positive academic outcomes. In contrast, approaches that undermine these developmental needs through control and dependency, prove harmful. Most critically, this study illuminates that even pro-supportive intentions can lead to negative consequences if the resulting interventions are ineffective, misaligned, or fail to empower the adolescent. The ultimate takeaway, therefore, is a call for a more sophisticated approach to parental education. It is no longer sufficient to advocate for "parental support" as a monolithic good. Instead, future programs and informational resources must emphasize the "how" over the "what"—guiding parents on the methods of providing support that is truly effective, developmentally appropriate, and ultimately, empowering for the student.

RECOMMENDATIONS

Based on the findings of the current investigation, a number of recommendations are proffered for academic policy establishments, caregivers, and future explorations in the subject. When approaching the matter of educational improvement, it is essential for Educational entities to recognize the limitations of a simple approach embracing the conventional term "parental involvement" in academic activities of the kids and provide detailed and precise information required for a practical involvement of the parents. On this logic, programs and recommendations should center around actualization of techniques that address the need within an adolescent for growth and independence thus positively stimulating their psychological development. Meaning, these constructive techniques should involve supplying teenagers with the relevant form of help when necessary but not controlled

Perceived Parental Support as a Predictor of Student Achievement: A Cross-National Analysis of PISA 2022 Data

by parents, showing actual concern in the affairs of the adolescents, and when need be, allowing for actual participation in those decisions made even while exposing them to the consequences of any given choice and more so, warning them against the negative consequences of undue psychological demand and overprotectiveness. Besides, as much emphasis should be placed upon the guidance to the parents and the delicacies of supporting their children's education as well as the difficult notions that good intentions through the attempts of help may bear negative reactions and feedback. It is important to note that parents can be taught to provide emotional support through understanding and listening to their children, as this allows them to develop their own 'tools' for dealing with problems, rather than, out of ignorance, creating the illusion of control that interferes in developing the independence of their children and helps them become stronger psychologically. Thus, there would be a scope for future research in this area, as currently, studies of longitudinal design are required to clarify the directionality of the relationship between parental responses and the academic achievement of children. Moreover, the quality of research could be improved by inquiring into how the different nuances of these dynamics can be manifest in various socio-cultural contexts and using qualitative methodologies to understand better the students' perceptions of these parental involvement and controlling behaviors. This line of inquiry is so important on producing comprehensive and elaborate evidence-based support for stakeholders, including educational planners, parents and the society.

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