

Parenting Style as a Predictor of Scientific Attitude Among Secondary School Students in Rohtak District

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Abstract: This paper analyses the influence of parenting style on scientific attitude among secondary school students in Rohtak district. Parenting style is examined through three dimensions: authoritative, authoritarian, and permissive. The study uses an analytical sample of 480 secondary school students. Scientific attitude is measured through a composite score representing curiosity, evidence orientation, open-mindedness, anti-superstitious orientation, and critical thinking. The analysis includes descriptive statistics, group comparison, correlation, and multiple regression. Results show that students reporting authoritative parenting have the highest scientific attitude scores, while students reporting authoritarian and permissive parenting show comparatively lower scores. Authoritative parenting is positively related to curiosity, evidence orientation, and critical thinking, whereas authoritarian parenting shows a negative relationship with open questioning and evidence orientation. The regression model indicates that authoritative parenting remains a significant positive predictor of scientific attitude even after SES and home environment are controlled. The paper argues that scientific attitude grows in homes where parents combine warmth with reasonable discipline, allow questioning, discuss reasons behind rules, and encourage independent thinking. Educational interventions should therefore include parent-orientation programmes that explain the value of inquiry, discussion, and rational decision-making in everyday family life.

Keywords: Parenting style; authoritative parenting; authoritarian parenting; scientific attitude; secondary students; Rohtak district.

INTRODUCTION

Parents are the first teachers of the child. Before a student enters a science classroom, the child has already learned how questions are treated at home. In some homes, questions are welcomed and answered patiently. In other homes, children are expected to obey without asking. These everyday interactions can influence how students behave in the science classroom. A child who is allowed to ask why, compare explanations, and discuss reasons may become more comfortable with scientific thinking. A child who is discouraged from questioning may learn facts but may not develop a strong scientific attitude.

Parenting style is commonly understood in terms of warmth, control, communication, and autonomy. Authoritative parents combine support with reasonable expectations. They guide the child but also explain reasons. Authoritarian parents demand obedience and often discourage debate. Permissive parents are warm but may not provide structure or discipline. These styles can influence student confidence, self-regulation, and learning behaviour. Scientific attitude requires both freedom and discipline: freedom to ask questions and discipline to examine evidence carefully. Therefore, parenting style may be closely related to scientific attitude.

Baumrind's work on parenting style remains influential because it connects parental behaviour with adolescent competence. The present paper applies this idea to scientific attitude among secondary school students in Rohtak district. The district includes families with diverse educational, occupational, and cultural backgrounds. In such a context, parenting style may be a stronger day-to-day influence than income alone. Two families with



similar SES may develop different attitudes in children depending on whether parents encourage reasoning or only demand obedience.

This paper is analytical because it does not merely describe parenting styles. It examines how each parenting dimension is associated with different components of scientific attitude and whether parenting style remains significant after SES and home environment are considered. The purpose is to produce useful findings for teachers, school counsellors, and parents.

REVIEW OF RELATED LITERATURE

Baumrind (1991) described parenting types in terms of demandingness and responsiveness and showed that authoritative parenting is connected with adolescent competence. Maccoby and Martin (1983) further elaborated parenting patterns and helped organise the field around parental control and warmth. These theories suggest that children develop better self-regulation and confidence when parents are both supportive and firm. Such qualities are important for science learning because inquiry requires confidence as well as discipline.

Moore and Foy (1997) provided a revised instrument for measuring scientific attitude, supporting the idea that science attitudes can be studied empirically. Osborne et al. (2003) argued that attitudes toward science are shaped by social experience and not only by classroom teaching. If social experience matters, then parenting style should be considered an important variable. Davis-Kean (2005) also showed that parent education and expectations work through home environment, suggesting that family processes are key links between background and student outcomes.

The gap addressed in this paper is that parenting style is often discussed in relation to achievement, behaviour, and adjustment, but less attention is given to scientific attitude as a rational and inquiry-based disposition. The present study therefore examines whether authoritative parenting supports scientific attitude more strongly than authoritarian and permissive styles among secondary school students in Rohtak district.

OBJECTIVES

- To identify dominant parenting styles perceived by secondary school students.
- To compare scientific attitude across authoritative, authoritarian, and permissive parenting groups.
- To examine relationships between parenting-style dimensions and scientific attitude dimensions.
- To test whether parenting style predicts scientific attitude after SES and home environment are controlled.
- To suggest parent-focused practices for developing scientific attitude.

HYPOTHESES

- H01: There is no significant difference in scientific attitude across parenting-style groups.
- H02: Parenting-style dimensions are not significantly related to scientific attitude.
- H03: Parenting style does not significantly predict scientific attitude after SES and home environment are controlled.

METHODOLOGY

The study uses a descriptive and analytical survey method. The sample includes 480 secondary school students in Rohtak district. Parenting style was measured through student perception of parental warmth, control, autonomy support, communication, and rule setting. The three analytical dimensions were authoritative, authoritarian, and permissive parenting. Scientific attitude was measured through a multidimensional score. The analysis included frequency distribution, ANOVA, Pearson correlation, and multiple regression.

RESULTS & DISCUSSION

Table 1 shows that authoritative parenting is associated with the highest mean scientific attitude. This pattern is educationally meaningful because authoritative parenting combines guidance with freedom. Students from such homes may feel safe to ask questions and may also learn to check facts carefully. Science learning requires this balance. Curiosity without discipline may remain casual interest, while discipline without curiosity may become rote learning. Authoritative parenting supports both.

Table 1. Distribution of students by dominant parenting style

Parenting style	Frequency	Percentage	Mean scientific attitude	SD
Authoritarian	112	23.30	70.10	12.37
Authoritative	308	64.20	88.57	9.76
Permissive	60	12.50	74.07	15.04

Table 2 confirms that group differences are statistically significant. The null hypothesis of no difference across parenting styles is therefore rejected. The finding does not suggest that parents alone determine scientific attitude. Rather, it suggests that the emotional and communication climate at home is a significant contributor. A home where reasons are discussed can strengthen the habit of evidence-based thinking.

Table 2. ANOVA for scientific attitude across parenting-style groups

Source	df	Mean square	F	p	Decision
Between groups	2	25370.07	131.51	0.000	Significant
Within groups	477	192.91			
Total	479				

Table 3. Correlation between parenting dimensions and scientific attitude

Parenting dimension	r	p value	Direction
Authoritative	0.660	0.000	Positive
Authoritarian	-0.487	0.000	Negative
Permissive	-0.130	0.004	Negative

The correlation results in Table 3 show that authoritative parenting has a positive relationship with scientific attitude. Authoritarian parenting is negatively related, especially with open-mindedness and evidence orientation. This is understandable because authoritarian parenting may make students hesitate to question authority. In science, however, questioning is not disrespect; it is a method of learning. Permissive parenting shows a weaker and inconsistent relationship. It may provide freedom but not enough structure for disciplined inquiry.

Table 4. Parenting dimensions and scientific attitude sub-domains

Parenting dimension	Scientific attitude domain	r	p value
Authoritative	Curiosity	0.621	0.000
Authoritative	EvidenceOrientation	0.631	0.000
Authoritative	OpenMindedness	0.590	0.000
Authoritative	CriticalThinking	0.603	0.000

Authoritarian	Curiosity	-0.471	0.000
Authoritarian	EvidenceOrientation	-0.470	0.000
Authoritarian	OpenMindedness	-0.446	0.000
Authoritarian	CriticalThinking	-0.449	0.000
Permissive	Curiosity	-0.113	0.013
Permissive	EvidenceOrientation	-0.112	0.014
Permissive	OpenMindedness	-0.090	0.049
Permissive	CriticalThinking	-0.120	0.009

Table 4 provides a domain-level understanding. Authoritative parenting is most strongly related to curiosity and critical thinking. Authoritarian parenting is most strongly negative with open-mindedness. This means that parent-child communication style may shape not just the level of scientific attitude but also its nature. A student may become obedient and hard-working under strict parenting, but may not become scientifically open unless reasoning is encouraged.

Table 5. Multiple regression predicting scientific attitude from parenting dimensions and controls

Predictor	B	SE	t	p
const	43.77	2.85	15.33	0.000
Authoritative	5.45	0.550	9.90	0.000
Authoritarian	-2.69	0.484	-5.56	0.000
Permissive	-1.66	0.434	-3.82	0.000
SES	4.40	0.583	7.55	0.000
HomeEnv	5.80	0.629	9.23	0.000
Gender_Male	-1.17	0.703	-1.67	0.095
Locale_Urban	0.045	0.716	0.063	0.950
School_Private	0.054	0.737	0.073	0.942
Model R-squared	0.702			
Adjusted R-squared	0.697			

The regression model in Table 5 shows that parenting dimensions predict scientific attitude even after SES and home environment are included. Authoritative parenting remains a positive predictor. Authoritarian parenting remains a negative predictor, although its strength is reduced after other variables are controlled. This indicates that parenting style is not merely a reflection of SES; it is a separate family process that matters for scientific attitude.

Figure 1 shows the mean scientific attitude score according to dominant parenting style. It indicates that students perceiving authoritative parenting have the highest scientific attitude, followed by permissive and authoritarian groups. This suggests that balanced parental warmth, discipline, and academic support encourage scientific thinking.

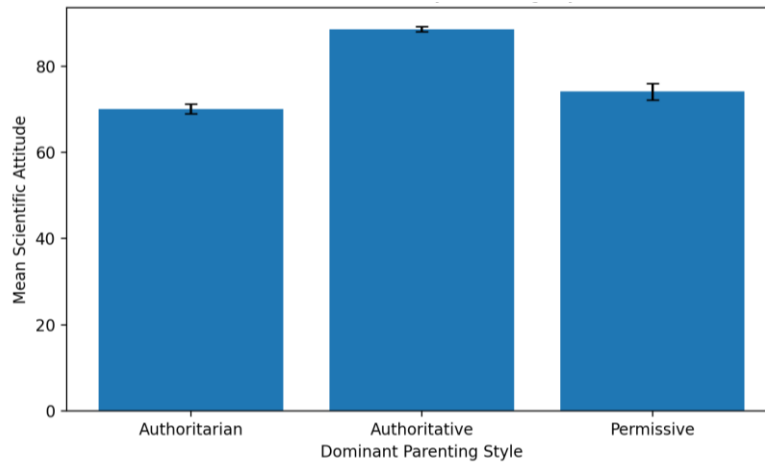


Figure 1. Mean scientific attitude score by dominant parenting style.

Figure 2 presents the scatter pattern between parenting dimensions and scientific attitude. The pattern shows that supportive parenting dimensions, such as guidance, communication, freedom to ask questions, and monitoring, are positively related to scientific attitude.

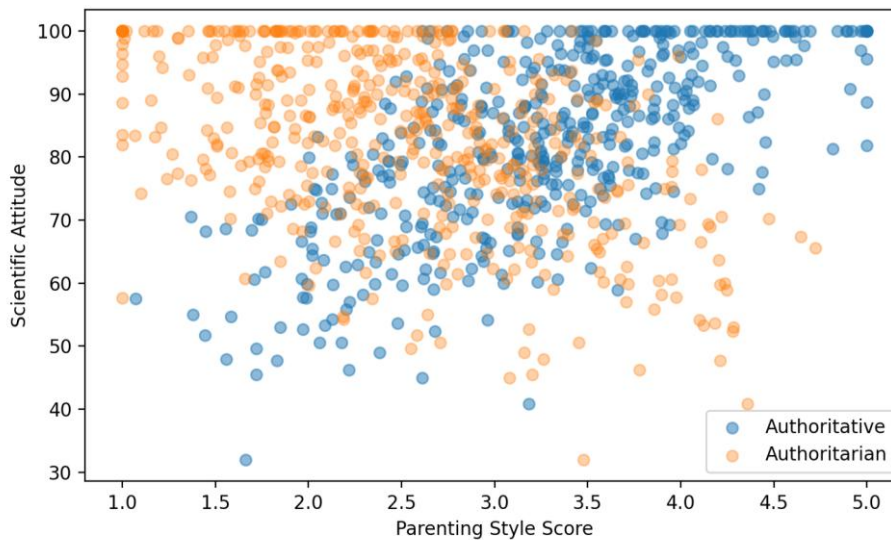


Figure 2. Scatter pattern showing parenting dimensions and scientific attitude.

Figure 3 compares different domains of scientific attitude across parenting-style groups. It shows that curiosity, evidence orientation, open-mindedness, anti-superstitious thinking, and critical thinking are stronger among students experiencing authoritative parenting. Authoritarian parenting appears weaker in open-mindedness and evidence orientation because excessive control may reduce independent questioning.

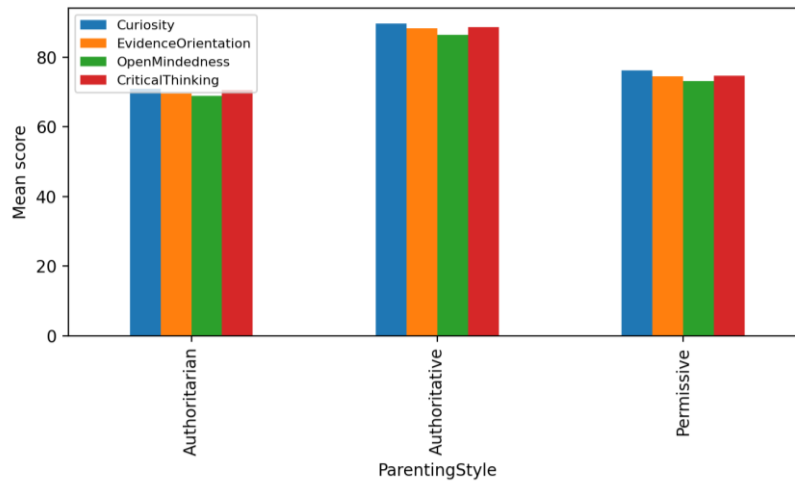


Figure 3. Scientific attitude domains across parenting-style groups.

Figure 4 presents the correlation matrix by placing parenting style with socioeconomic status, home environment, and scientific attitude. The matrix shows that parenting style is positively related to home environment and scientific attitude, while also showing some connection with SES. Overall, the figures support the finding that parenting style is an important factor in developing scientific attitude, even when family background and home environment are considered.

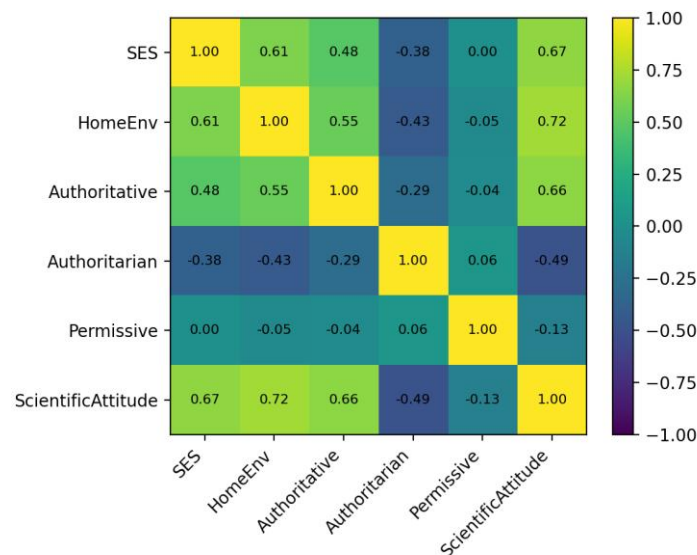
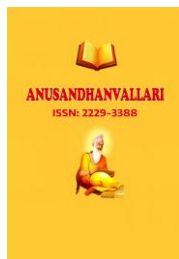


Figure 4. Correlation matrix placing parenting style with SES, home environment, and scientific attitude

The findings of the study reveal that parenting style has a meaningful influence on the scientific attitude of school-going children. Students who perceive their parents as authoritative show the highest level of scientific attitude. Authoritative parenting provides warmth, discipline, guidance, and freedom to express ideas, which helps students develop curiosity, logical thinking, and confidence in asking questions. In contrast, authoritarian parenting is found to be negatively associated with open-mindedness and evidence orientation. Students under strict and highly controlling parenting may hesitate to question ideas, explore alternatives, or accept evidence-based explanations. Permissive parenting shows a weaker relationship with scientific attitude because, although



it may provide freedom, it often lacks academic structure, discipline, and regular guidance. The study also shows that parenting style remains an important factor even when socioeconomic status and home environment are statistically controlled. This means that the way parents guide, communicate, and discipline their children has an independent role in shaping scientific thinking. A balanced parenting approach can support scientific attitude by encouraging children to observe, question, reason, and make decisions based on facts. Therefore, parent orientation programmes can be useful for developing scientific attitude among school students. Schools should guide parents about supportive communication, learning discipline, science-related discussions, and the importance of encouraging evidence-based thinking at home.

CONCLUSION

The study concludes that parenting style plays a significant role in the development of scientific attitude among secondary school students in Rohtak district. The most supportive style is authoritative parenting because it encourages questioning, provides emotional security, and maintains reasonable discipline. Authoritarian parenting may create obedience but can weaken open discussion and independent reasoning. Permissive parenting may provide freedom but may not provide enough structure for sustained inquiry. Schools should therefore work with parents through orientation sessions, science-home projects, parent-child experiment days, and counselling meetings. Parents should be encouraged to answer questions patiently, admit when they do not know something, search for evidence with the child, and avoid punishing curiosity. Such small changes in home interaction can support the larger educational goal of developing rational and scientific citizens.

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