Prediction of Adolescents' Self-efficacy based on Parent Adolescent Relationship with respect to Demographic variables: A Decision Tree Approach

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Abstract

During adolescence the quality of relationship adolescents had with their parents as children changes. Most of the behaviors of children are influenced by parents, but during adolescence stage, their behaviors are more influenced by peer group. But still, parents play a crucial role in adolescent relationship. The parent-adolescent relationship may have a significant influence on the overall well-being of adolescents. Adolescents' self-efficacy refers to individuals belief about their ability to solve a problem, reach a goal and complete a task, in a successful manner. The present study aims to examine adolescents' self-efficacy based on their relationship with their parents and also in relation to demographic variables such as gender, class of study, type of institution, order of birth, family type, mother's age, father's age and residing with or without parents. The researcher selected 756 adolescents of age group 13-18 years from 14 schools in Thrissur city, Kerala through lottery method. Parent-child relationship scale (adolescent form) developed by Sajitha & Parameswari and General self-efficacy scale by Schwarzer and Jerusalem were used to collect the data. The investigator employed percentage analysis and decision tree using SPSS. Results showed that different mother, father combinations based on their

parent child relationship and adolescents class of study and type of institution have played a prominent role in predicting self-efficacy.

Key Words: Adolescence, Parent-child Relationship, Decision tree, Self-efficacy.

Background

Self-efficacy is an individual's belief in competence to attempt difficult or novel tasks, and to cope with adversity arising from specific demanding situations (Cross et al., 2006; Luszczynska et al., 2005; Scholz et al., 2002). High self-efficacious individuals choose more ambitious tasks, and with constant hard work they try to reach the goals. Actions are pre-shaped in thought, and once an action has been taken, highly self-efficacious people invest more effort and persist longer than do those with low self-efficacy. When setbacks occur, they recover more quickly and remain committed to their goals. (Bandura 1997, 1999).

The primary socializing school, where the children's needs are fulfilled is the family. It is from the family the children acquires specific skills to succeed in life. A well-organized family can influence a child's psychological, social, emotional and economic state (Mishra & Shanwal, 2014). Parents play an important role here. The first and foremost role models in children's life is the mother and father. Children observe the behavior of their parents and try to inculcate that behavior pattern in their future life. Early researchers have found that behaviors of parents have a wide range of impact on the development of children's social competence (McDowell & Parke, 2009). McDowell and Parke (2009) found parental instructions that are directed towards children's social problem-solving was related to the positive peer outcomes, especially among younger children and also this parental instruction influences children's social competence. Parental instructions and provisions of social

opportunities have a direct linkage to the vicarious experience and verbal persuasion elements of self-efficacy, and so, self-efficacy and social competence can be developing through modelling the parents' social behavior, involvement and through parental encouragement of social interaction (Gardner, 2011).

"The attachment theory states that childhood experiences of attachment to a primary caregiver are vital to children's development of self-reliance and their ability to develop positive relationships as they age" (Ainsworth & Bowlby, 1991). Bretherton (1992), stipulated that when appropriate care and support is extended to the child's needs by the caregiver, the child acquires an internal working model of the self, which is considered as valued and reliable. Nevertheless, if the caregiver refuses to do so and ignore the child's need for comfort and exploration, the child sees himself as unworthy or incompetent (Bretherton, 1992). Dowell and Parke (2009), indicate that parent-child interaction, advice giving by parents, and parental provision of opportunities by both fathers and mothers predict children's social competence and, in turn, social acceptance. Parents provide care, support and an encouraging atmosphere for their children, that helps them develop a sense of confidence in their abilities and are able to succeed in carrying out their tasks. Parents assistance definitely will help a child in promoting a sense of meaningfulness, understandability and predictability that in turn improves the thinking about one's own mind and others mind, and also how they both influence each other (Howe,2011).

In an attempt to have a comprehensive understanding of parenting, it becomes important to acknowledge the multiple factors within the family with the larger community (Deater-Deckard, 2011). With changing times, it is not only the practices of parenting that are evolving but also the attachment patterns and perceptions encompassed, especially within a parent-adolescent relationship (Sondhi, 2017).

According to Bandura (1977), previous performance, external learning or modelling, and social influences such as encouragement and support are some of the contributing mechanisms for self-efficacy. Researchers stipulate that self-efficacy regarding one's capabilities to execute actions necessary to achieve one's designated goals has a stronger relationship in academic performance than any other motivational beliefs (Wang & Wu, 2008). Bandura (1997) posited that family relationships are the first source of the initial development of self-efficacy. Bandura (1997) suggested that children must acquire awareness of their increasing capabilities across widening areas of functioning. Parents by default are the first socializers of children, as they are models of behavior, responsible to deliver verbal reinforcements, and help children formulate the ideology of the self. As agents of socialization, parents expose children to social norms, values, and expectations. Interactions within the family expand the child's catalogue of skills and move the kid into a readiness to interact in an increasingly larger social atmosphere. Thus relationship with parents has been correlated with positive peer relationships in adolescents with increased family support, increasing the likelihood of adolescents reporting peer acceptance (Dekovic & Meeus, 1997).

Adolescents' family satisfaction appears to be intimately connected to the standard of parent–child interactions and to their appraisals of family cohesion and adaptability (Belsky, Jaffee, Hsieh, & Silva, 2001). Empirical findings shows that adolescents who are satisfied with their family life are more prosocial and have a better sense of self‑worth (Gilman, 2001; Gilman & Huebner, 2000; Harter, 1999). Conversely, dissatisfaction with family life is amid social and emotional difficulties, like negative peer relations, anxiety, and depression (Cumsille & Epstein, 1994; Huebner & Alderman, 1993; Valois, Zullig, Huebner & Drane, 2001).

Considering the importance of self-efficacy in adolescents based on parent-child relationship along with different demographic variables, this study aimed to investigate the influence of parent-child relationship with respect to demographic variables on self-efficacy among adolescents using decision tree. Decision trees produce classification rules that are easy to interpret (Surjeet, Yadav, Bharadwaj & Pal, 2012).

Methodology

In this study, the researcher adopted survey method that is descriptive in nature and considered self-efficacy as dependent variable and parent-adolescent relationship as the independent variable. Variables like gender, order of birth, class of study, family type, type of institution, mother's age, father's age and residing with or without parents has been considered as demographic variables. Sample of 756 adolescents aged between 13-18 years were selected through lottery method from 14 schools in Thrissur city, Kerala. Parent-child Relationship scale (Adolescent form) developed by Sajitha and Parameswari (2019), with internal consistency 0.86 and Self-efficacy scale by Schwarzer and Jerusalem (1995) with reliability 0.80 were used to collect the data. The re-established reliability co-efficient of GSE was 0.84. Decision tree (SPSS version 23) were used to measure, the influence of parent-child relationship on self-efficacy among adolescents.

Table:1

Distribution of sample on the basis of Demographic variables

Sl. No.	Factor	Attributes	Frequency	Percentage (%)
1.	Gender	Male	374	49.5
		Female	382	50.5
2.	Order of Birth	First born	198	26.2
		Second born	426	56.3
		Latter born	132	17.5
3.	Class of study	Secondary	524	69.3
		Higher Secondary	232	30.7
4.	Family Type	Nuclear family	609	80.6
		Joint family	147	19.4
5.	Type of Institution	Government	168	22.2
		Aided	588	77.8
6.	Father's Age	35-45	517	68.4
		46-60	239	31.6
7.	Mother's Age	30-40	473	62.6
		41-55	283	37.4
8.	Residing	With parents	692	91.5
		Not with parents	64	8.5

The self-efficacy of adolescents in the form of scale data is considered as the dependent variable and parent-adolescent relationship as the independent variable.

Results and Discussion

Table 2

Levels of Parent-Adolescent Relationship

	Mean	SD	M-SD	M+SD	Low		Moderate		High	
					n	%	*n*	%	*n*	%
Father	62.96	7.83	55	71	245	32.4	442	58.5	69	9.1
Mother	66.29	8.17	58	75	141	18.7	480	63.5	135	17.9

To have a more meaningful interpretation, the scale data is converted into categorical variables such as low, moderate and high, based on the obtained mean and standard deviation scores. From table 2 it is clear that the strength of relationship of adolescents with their father is low 245 (32.4%). 442 (58.5%) adolescents strength of relationship with their father is moderate and only 69 (9.1%) adolescents' relationship is high with their fathers. In the case of strength of mother-adolescent relationship, 141 (18.7%) have low relationship, 480 (63.5%) have moderate and 135 (17.9%) have high level of relationship with their mothers. This clearly shows that the strength of relationship of a large number of adolescents is moderate with their parents.

Every adolescent differ in their level of relationship with father and mother. The researcher formulated nine possible different parental combinations (table 3) based on relationship with adolescents to know more about parent-adolescent relationship.

Table 3

Distribution of Adolescents among different combination of Parent-Adolescent Relationship

		Mother					
	Levels	Low		Moderate		High	
		n	%	*n*	%	*n*	%
Father	Low	55	7.3	135	17.9	55	7.3
	Moderate	86	11.4	314	41.5	42	5.6
	High	0	0	31	4.1	38	5.0

From table 3 it is seen that 55 (7.3%) adolescents have low level relationship with both their father and mother (LL). 135 (17.9%) adolescents have low level of relationship with father, but moderate level of relationship with mother(LM). 55 (7.3%) adolescents have low level of relationship with father and high level of relationship with mother (LH). 86 (11.4%) adolescents seems to have moderate relationship with father and low relationship with mother (ML). 314 (41.5%) adolescents have moderate relationship (MM) with both the parents. While 42 (5.6%) adolescents have moderate relationship with father and high relationship with mother (MH). No adolescents have high level of relationship with father and low level of relationship with mother (HL), 31 (4.1%) adolescents have high level of relationship with father and moderate with mother (HM). Finally only 38 (5%) adolescents have high relationship with both father and mother (HH). This clearly shows that majority of the adolescents are having moderate relationship with both father and mother. This confirms the results obtained in table 2.

SPSS version 23 was used to perform Decision Tree Analysis. Decision tree analysis is an effective method used to classify and predict the target variable coded with nominal scale into several sub-groups of a tree structure. Also, decision tree effectively analyzes the interactions between continuous variables and discrete variables. Chi-squared automatic interaction detection (CHAID) growing method is used for predicting target variables and to conduct multiple split using chi-square verification. Multiple split is the classification done by separating two or more child nodes from the parent node. Minimum Cases fixed in parent node and child node is 100 and 50 and decision tree was carried out. The result shows that the maximum depth of the tree is 3 with 12 Nodes and 8 Terminal Nodes. The investigator considered parental combination and demographic variables like gender, order of birth, class of study, type of family, type of institution, mother's age, father's age and residing with or without parents to perform the decision tree. Amongst, parental combination (independent variable) based on their relationship with adolescents, is forced as the first classifying variable. The result shows that parental combination, class and type of institution the adolescents are studying have significant influence with the model and are included in the tree formation. On the other hand, variables like gender, order of birth, family type, mother's age, father's age and residing with or without parents have no significant influence, therefore these variables are excluded from the tree model.

Figure: Decision Tree Model
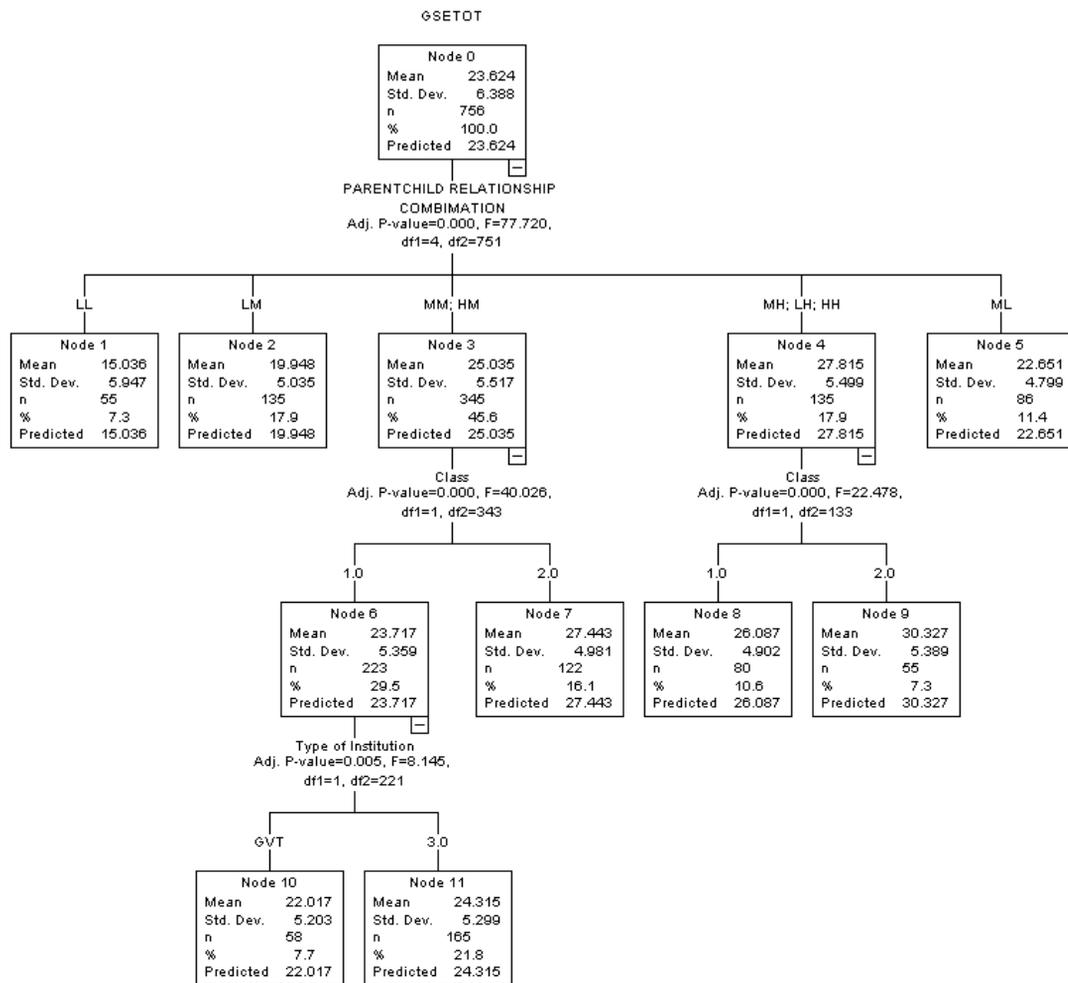
It has been inferred from the tree diagram that node 0 (parent node) (N=756) shows mean value of adolescent's self-efficacy as 23.62 and SD 6.38. The predicted mean value is 23.62. Adolescents self-efficacy showed significant difference in self-efficacy with different levels of parent-adolescent relationship combination patterns ($F_{(4,751)}$= 77.72, p<0.05).The relationship pattern is classified into five branches node 1-5. Node 1 indicates adolescent showing low level relationship with both father and mother (LL. Their predicted mean value of their self-efficacy is 15.036. Likewise, node 2 indicates adolescents who had lower relationship with father and moderate relationship with

mother (LM) and the predicted mean value of their self-efficacy is 19.95. Whereas, node 3 shows adolescents having moderate relationship with both parents' (MM) and those showing high level relationship with their father and moderate relationship with mother (HM). The predicted self-efficacy mean value of node 3 is 25.035. Further node 4 adolescents have high relationship with mother and all three levels of relationship with father merged together showed predicted self-efficacy value of 27.82. Node 5, includes adolescents who have moderate relationship with their father and low relationship with their mother with predicted self- efficacy value of 22.05.

Next to different parent adolescent relationship combinations, demographic variables have been considered as strongest significant influencers of self-efficacy by $F_{(1,343)}= 40.02$, $p<0.05$. Further, node 3 and node 4 are again classified into two each based on their class of study. Node 3, contains adolescents who have parents with moderate relationships with them (MM), and father with high relationship and mother with moderate relationship (HM). This node has a mean value of 25.03 and SD of 6.61 for total of 345 adolescents. The predicted mean value is 25.03. This shows a significant difference in parent adolescent relationship with respect to the class of study.

Similarly node 4 has also undergone two classifications, based on the class of study. The predicted mean value of adolescents with a combination of MH, LH and HH i.e. those having moderate relationship with father and high relationship with mother, low relationship with mother and high relationship with father and adolescents having high relationship with both parents is found to be 27.81 and SD value is 5.49 for total of 135 adolescents with $F_{(1,133)}= 22.47$, $p<0.05$. This shows a significant difference in parent adolescent relationship with respect to their class of study.

Node 6 is classified into node 10 and node 11. The predicted mean value and the F value shows a significant difference in parent-adolescent relationship among adolescents studying in the secondary classes with respect to their institution. The predicted mean value of adolescents is found to be 23.71 and SD value is 5.35 for total of 223 adolescents with $F(1,221) = 8.14$, $p < 0.05$.

Self-efficacy is predicted well for the adolescents who have their schooling in either government or aided institutions, especially those studying in classes 8th, 9th and 10th standards (secondary), having either moderate level of relationship with both parents or high relationship with father and moderate relationship with mother. Likewise the self-efficacy of adolescents studying in higher secondary class (plus one and plus two) is predicted for having moderate level of relationship with both parents or high relationship with father and moderate relationship with mother.

On the other hand adolescents irrespective of their class of study (secondary or higher secondary), high level of relationships with mothers predict a high level of self-efficacy. In all the three combinations it is clearly shown that father has either low, moderate and high relationships, which does not matters much. Whereas when mother-adolescent relationship is strong, it can help the adolescents to have a belief in their ability to complete certain tasks and to succeed in the situations they come across.

To put in nutshell, adolescent's self-efficacy is strongly predicted by the type of schooling, the class of study and mother-adolescent relationship. When the strength of mothers relationship with adolescents is moderate or high, it affects the adolescents self-efficacy in positive direction. Mothers act as a guide for their children, that they are particular in helping them find routes in different phases of development (Sajitha & Parameswari, 2019). Research by Denham (1989) analyzed that when mothers are

emotionally detached or express emotions negatively, their infants and toddlers cope poorly with stress.

Implications

The present study reveals that while predicting adolescent self-efficacy, parent-adolescent relationship combination, class of study and type of institution they belong to show considerable significant influence. Further, it also shows that compared to adolescent relationship with their father's, adolescent relationship with mother's strongly predicts the self-efficacy of adolescents aged 13-18. The care and support that the parents provide plays a pivotal role in developing the children's self-efficacy. Children with high sense of self-efficacy are confident and are able to successfully accomplish a task. Based on this decision tree, the adolescents falling under the group of low relationship with parents can be easily identified. Interventions can be given to the parents and adolescents based on this and through this self-efficacy can be improved.

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