

Assessment of Family Functioning Among Agricultural High School Students in A Full-Time Educational System

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ABSTRACT:- The academic performance of children is a source of concern for parents, but it also becomes a concern for institutions. This study aimed to determine the relationship between background family functioning and academic performance in agricultural high school students living away from home and attending full-time school. The sample consisted of 343 preparatory students, 157 students from agricultural high school (AHS) and 186 students from preparatory course (PrC). To determine the relationship between academic performance and background family functioning, the Family Cohesion and Adaptability Assessment Scale (FACES III) was administered, which was classified into three categories: functional; dysfunctional; and borderline. The grades for the two levels of study (AHS and PrC) showed differences ($P < 0.05$), with the AHS students achieving a lower average grade (8.5 ± 0.5) compared to the PrC students, who obtained the highest average grade (8.8 ± 0.7). The students' adaptability was flexible, while their cohesion was weak. Based on these results, the study found the family functioning of the middle school students at the Autonomous University of Chapingo was balanced or functional.

Keywords: Adaptability, family functioning, self-esteem, academic performance, agricultural high school students.

I. INTRODUCTION

The concept of family has undergone significant changes over the years. The traditional nuclear family model—historically the basic kinship unit consisting of a mother, father, and children (or other dependent family members)—has evolved (Fuentes Aguilar & Merino Escobar, 2016; Hasanah & Deiniatur, 2018). Economically dependent members were typically the couple's biological or adopted children (Martínez Vasallo, 2015). Today, single-parent families arise from diverse circumstances: parental divorce where children remain with one parent; situations such as teenage pregnancy—creating the "single-mother family" structure that is a focus of public policy in Mexico (Huerta Mata, 2018); or the death of a parent. Furthermore, there are same-sex families in which male or female couples establish a household with children from previous heterosexual unions, or through adoption, foster care, assisted reproduction, or surrogacy (Martínez Vasallo, 2015; Pláceres Hernández et al., 2017; Van Gasse & Mortelmans, 2020).

Regardless of family type, children's academic performance is typically a matter of concern for parents, given that grades reflect how well a student is doing in school. However, when students study away from their families without constant supervision, responsibility for academic performance becomes a primary concern for both the students themselves and the institutions providing academic and support services—particularly because low academic performance can lead to school dropout, thereby affecting the institution's performance indicators. Literature acknowledges that academic performance is a multidimensional phenomenon involving personal, family, social, economic, and educational factors. These factors may include psychoactive substance use, access to technology and classroom facilities, friendships, socioeconomic status, and ethnic identity, all of which can influence students' motivation and academic performance (Alj & Bouayad, 2024; Giersch et al., 2021; Grindal & Nieri, 2015).

Within the family environment (particularly during adolescence), individuals are enabled to face and overcome the challenges of that difficult stage; constant attention is essential, as it reinforces young people's sense of acceptance and emotional worth. However, upon entering the agricultural high school at the University of Chapingo, students gain independence from their families and undergo significant social and academic changes; this is especially significant for those who leave home and relocate to pursue their studies. Consequently, the educational environment becomes vital to the students' socialization process, fostering greater understanding, the recognition of social values, and enhanced learning—the latter being measured by academic performance. Academic performance is influenced by the teacher's pedagogical intervention and reflected in student learning (Roksa & Kinsley, 2019; Sánchez et al., 2016); these outcomes arise from numerous social variables—such as institutional, pedagogical, psychosocial, and sociodemographic factors—that both influence and are influenced by the learner. School grades serve as a source for evaluating educational outcomes and constitute the criterion used to define academic performance (Capdevila & Bellmunt, 2016; Montero Rojas et al., 2007).

Therefore, analyzing the relationship between family functioning and academic performance in agricultural high school students is of great importance to determining the direct relationship of these factors in the lives of children in an environment isolated from the home. In this study, the objective was to understand the relationship between family functioning and academic performance in agricultural high school students living apart from their families and under a full-time study model.

II. METHODS

This study was nonexperimental, explanatory, quantitative, and predictive in nature. Its population consisted of students enrolled in the third year of agricultural high school (AHS) and preparatory course (PrC) for admission to the undergraduate program at the Autonomous University of Chapingo (UACH) at its campuses in Texcoco, Mérida, Huatusco, and Tabasco, Mexico. The sample of 343 students was selected using nonprobability convenience sampling and comprised: four groups of sixth semester of agricultural high school ($n=36$, $n=37$, $n=40$ and $n=44$ respectively) from the Texcoco campus; two groups of the preparatory course located in the Southeast Regional University Unit (URUSSE) in Tabasco ($n=19$ and $n=40$); one group of preparatory course in the Peninsula of Yucatan Regional University Center (CRUPY) located in Mérida, Yucatan ($n=40$); and two groups from the Eastern Regional University Center (CRUO) in Huatusco, Veracruz ($n=42$ and $n=45$).

To determine the relationship between academic performance and family functioning, a questionnaire was administered using the Family Adaptability and Cohesion Evaluation Scales (FACES III), which, according to the score obtained, is classified into three categories: a) functional (balanced system); dysfunctional (extreme system); and borderline (system in the middle range) (Gutiérrez-Saldaña et al., 2007). The score was obtained by summing the odd-numbered items that determined cohesion, which relates to identity, acceptance, unity, and family planning. According to the class scale, cohesion was categorized as disengaged (10–34), separated (35–40), connected (41–45), and enmeshed (46–50). The even-numbered items measure adaptability, which relates to family decisions regarding rules, family activities, and problem-solving, and are categorized as rigid (10–19), structured (20–24), flexible (25–28), and chaotic (29–50). Finally, the cohesion score was compared with the adaptability score, providing the type of family system functionality (Bazo-Álvarez et al., 2016).

The questionnaire was provided in printed form. Following the instructions, the questionnaire, which was designed to assess family functioning, took 40 minutes to complete. Participants were instructed not to mark any item more than twice. If they had any questions or needed to clarify any doubts they were asked to do so individually. No items were to be left unmarked. Participants were instructed to complete the questionnaire individually, answering each item honestly and filling in the personal information fields clearly and truthfully. After administering the questionnaires, each student's grades at the end of the first semester were recorded to correlate the independent variables with academic performance.

III. DATA ANALYSIS

The data were analyzed using the R program (R Core Team, 2024), which yielded correlations between the different scales of the analyzed instruments using Spearman's rank correlation coefficient. Additionally, the SAS program was used (SAS, 2017) to determine the normality of the response variables with the Kolmogorov–Smirnov and Shapiro–Wilk tests and analysis of variance (ANOVA) was performed using the JASP software (JASP Team, 2020). Part of the information integrated into an Excel database was processed, and descriptive statistics were calculated.

IV. RESULTS

Academic performance

The grades for the two levels of study (agricultural high school, AHS; and preparatory course, PrC) showed differences ($P<0.05$), with the AHS students having a lower average grade (8.5 ± 0.5) compared to the

PrC students who had the highest average grade (8.8 ± 0.7). Differences were also observed due to the students' place of origin ($P < 0.05$). Students from Tabasco and Yucatán had the highest average grades, while those from Texcoco had the lowest (Table 1).

Based on the family functioning questionnaire, the odd-numbered items indicated that adaptability for both AHS and PrC students was flexible (25–28), with the threshold very close to chaotic (29–50). Furthermore, cohesion was weak (35–40) in both AHS and PrC students (Table 2). With these results, family functioning for middle school students at the UACH was considered balanced or functional.

Adaptability

Although the average adaptability proved to be flexible, the largest percentage of students exhibited chaotic adaptability, with approximately 50% in both AHS and PrC. A minority displayed rigid adaptability, while approximately 40% exhibited structured or flexible adaptability. The percentages in both levels (AHS and PrC) were similar across all adaptability categories (Table 3).

The distribution of the recorded responses for adaptability behaved as a normal distribution according to the Shapiro–Wilk test ($P < 0.05$) which is verified in Figure 1, which shows the counts according to the score derived from adaptability.

Cohesion

In terms of cohesion, the highest percentage of students exhibited the separated category, and a high percentage also showed a connected category. The least frequent category was amalgamated cohesion, with less than 12%. Similar results were observed in both agricultural high school and preparatory course (Table 4).

Cohesion did not have a normal distribution, it was observed that the largest number of students deviated the distribution towards the separated and connected category, so the average was 38 points (Figure 2).

Family functioning

Based on the previous results regarding adaptability and cohesion, it was determined that AHS students at the UACH presented predominantly mid-range or borderline family functioning, with 52% of AHS students and 62% of PrC students exhibiting this level. Balanced or functional family functioning was found in about a quarter (in 24–27%) of the students. Extreme or dysfunctional family functioning was found in 19% of AHS students and 13% of PrC students (Table 5).

The number of students who showed extreme, balanced, and average family functioning was similar in agricultural high school and preparatory students (Figure 3).

Correlations

There was no relationship between academic performance, measured as the semester grade point average, and the family functioning score, nor with the cohesion or adaptability scores (Table 6). Only a moderate positive correlation was observed between adaptability and cohesion ($r = 0.44$).

V. DISCUSSION

Adaptability

Family functioning has been studied by analyzing two components: adaptability and family cohesion (Li et al., 2021). Adaptability relates to the individual's integration into family decisions regarding rules and problem-solving (Spitz & Steinhausen, 2023). In the study of Bazo-Álvarez et al. (Bazo-Álvarez et al., 2016), adaptability is indicated as a synonym for flexibility, and in both studies, four levels were used: chaotic; flexible; structured; and rigid. Chaotic and rigid adaptability represent the extremes and are therefore considered problematic situations, while the moderate levels (flexible and structured) are represented as functional adaptability. The results of this research showed that approximately 50% of the agricultural high school and preparatory course students exhibited chaotic family adaptability, higher value than other study in Romania (Rada, 2014). This means that parents do not exert total control over the family, and children have significant involvement in decisions that are not their responsibility. Furthermore, discipline is irregular, and rules change constantly, implying a lack of authority, respect, or leadership (Bazo-Álvarez et al., 2016). A smaller proportion of students fell into the rigid category, characterized by strong, even authoritarian, parental leadership and little participation from children in decisions made, resulting in fixed roles, strict discipline, and a lack of change. Around 40% of participants showed intermediate levels of adaptability, categorized as structured and flexible, characterized by shared leadership, roles, and discipline. These findings indicate that a significant portion of the families from which UACH agricultural high school students come experience difficulties maintaining stable rules and roles, although a considerable percentage also retain characteristics associated with a functional family organization. There are many reasons why families may lack ideal adaptability and cohesion, and the FACES III questionnaire did not allow for the inclusion of explanatory factors. One possible cause is likely related to the

students' age, as adolescence is a critical period where social skills play a significant role in each individual's personal development, and the family plays a fundamental role in the development and consolidation of these skills (Esteves Villanueva et al., 2020). The similarity observed between agricultural high school and preparatory course students, who had an average age of 19, suggests that family dynamics remain relatively constant during this educational stage.

Cohesion

Family cohesion refers to the degree of emotional bond between family members, and in this category, the "separated" category predominated, exhibited by 35–39% of students. This category is characterized by individualism, moderate emotional bonding among family members, and a degree of family dependence with a greater inclination towards independence. Between 27% and 35% of students experienced "connected" or "united" cohesion, characterized by considerable emotional bonding, loyalty, and dependence among family members, though with some degree of independence. "Disengaged" or "detached" cohesion was present in 21% of cases, characterized by an absence of emotional bonding among family members, a lack of loyalty to the family, and high personal independence. Finally, "enmeshed" or "entangled" cohesion registered the lowest percentages (8–18%) and was characterized by strong emotional bonding among family members, a demand for fidelity and loyalty to the family, and a high degree of dependence on decisions made collectively. According to Olson's circumplex model, intermediate levels of cohesion (detached and attached) are typically associated with optimal family patterns, and their members are able to be both independent and connected to their families. Unbalanced levels (detached and enmeshed) are seen as dysfunctional if these extreme levels persist for an extended period (Bazo-Álvarez et al., 2016).

Family functioning

By integrating the dimensions of adaptability and cohesion, it was found that the predominant family functioning was in the mid-range, with percentages of 52% in agricultural high school and 62% in preparatory course. On the other hand, approximately a quarter of the students presented balanced functioning (24.5–27.7%), while a smaller proportion showed extreme functioning (13.0–19.4%). These results suggest that most families possess sufficient resources to meet daily demands, although they still have areas that can be strengthened to reach optimal levels of functioning.

The findings obtained do not coincide with those reported by Real-Delor et al. (2024), who indicate that good family functioning promotes adaptation to change and contributes positively to academic performance, an aspect that was not observed in our study's population since there was no correlation between academic performance and family functioning, nor with the components of adaptation and cohesion. Similarly, the results are consistent with those reported by (Atahuaman-Arroyo et al., 2020), who found that adequate family functioning positively influences students' empathy. Taking into consideration that more than 75% of the participants fell within the average and balanced functioning levels, it is possible that these family characteristics contribute to the development of socio-emotional skills that are important for coexistence and interpersonal relationships.

Although this study showed a predominance of average-range functionality over balanced functionality, the results suggest that families maintaining adequate levels of cohesion and adaptability can provide favorable conditions for students' academic and personal development. These results may differ from those reported in other studies because the university operates under different conditions, providing comprehensive student support services and full-time academic support, which contributed to a relatively good overall average. Among the variables considered in other studies that affect functionality, the families's socioeconomic status is described, which has a direct positive correlation with family functioning. Therefore, the lower the economic status, the more time the family dedicates to satisfying basic needs, neglecting the emotional demands and satisfaction of the family (Delfin-Ruiz et al., 2020).

A review study by Rocha Rodriguez et al. (2022) highlights that healthy family functioning, adaptability, and positive intrafamilial relationships are fundamental factors for students' educational development and, consequently, their academic performance. However, the study also identified negative factors that frequently contribute to academic failure. Studies indicating family problems, dysfunctional families, and chaotic adaptability showed low academic performance. In this regard, although a significant proportion of students in our study exhibited chaotic adaptability, the predominant presence of average levels in family functioning indicates that families maintain cohesion and adaptability that allow for the academic and emotional development of young people.

Finally, the results partially support the argument put forth by Shi et al. (2025), who suggest that academic and professional success must be based on adequate family functioning. While balanced functioning was not the predominant condition, most students in our study fell within intermediate functional levels, reflecting the existence of a relatively favorable family environment. However, the presence of students with

extreme functioning highlights the need to implement family guidance and strengthening strategies that promote more balanced relationships, thus contributing to students' overall well-being and academic performance (Shi et al., 2025).

VI. CONCLUSIONS

The adaptability of the agricultural high school and preparatory course students showed a chaotic family dynamic, characterized by irregular discipline and a lack of authority or respect. A smaller proportion of students fell into the rigid category, where discipline is strict, and around 40% of students exhibited structured or flexible adaptability, characterized by shared leadership, roles, and discipline.

Many agricultural high school students came from a separate family structure where individualism prevails (35%). Another similar percentage showed a connected family structure with considerable emotional bonds among family members, while less than 20% had a detached or enmeshed family structure, representing the extremes of personal independence and a high degree of dependence. Due to the independence of the agricultural high school students, no correlation was observed between academic performance and the responses to the FACES III questionnaire (family functionality) in its adaptation and cohesion components.

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Table 1. Average grade of the semester prior to the instrument's application, according to the grade, sex, place of origin, and group of students at the Autonomous University of Chapingo.

Variables	N	Mean (arithmetic)	Std. Deviation	Minimum	Maximum
Grade		**			
Agricultural high school	137	8.5 ^b	0.5	6.2	9.8
Preparatory course	179	8.8 ^a	0.7	6.7	10
Sex		ns			
Men	191	8.6	0.7	6.7	10
Women	124	8.7	0.7	6.2	10
Provenance		**			
Tabasco	56	8.9 ^a	0.7	7.2	9.9
Texcoco	137	8.5 ^b	0.5	6.2	9.8
Veracruz	83	8.6 ^b	0.7	7	10
Yucatán	40	8.9 ^a	0.8	6.7	10
Group		ns			
3-High school	29	8.5	0.7	6.2	9.6
4-High school	35	8.6	0.5	7.7	9.5
14-Preparatory	17	8.8	0.8	7.2	9.9
15- High school	73	8.7	0.6	7.6	9.9
16- Preparatory	79	8.7	0.7	6.7	10
20- Preparatory	41	8.6	0.7	7	10
21- Preparatory	42	8.7	0.7	7	10

ns: not significant, ** highly significant ($P < 0.05$). Different letters in each variable are statistically different ($P < 0.05$).

Table 2. Descriptive statistics of the components of family functioning according to the grade level of Agricultural high school and preparatory course students.

	Adaptability			Cohesion		
	Agricultural high school		Preparatory course	Agricultural high school		Preparatory course
N	155		184	155		184
Category	Flexible		Flexible	Separate		Separate
Mean	28.69		28.37	38.56		38.41
Std. Deviation	6.22		5.97	6.02		6.14
Shapiro-Wilk	0.98 ns		0.99 ns	0.95 **		0.91 **
Minimum	10		11	10		17
Maximum	50		43	50		49

ns: not significant, ** highly significant ($P < 0.05$).

Table 3. Frequency of students according to adaptability in family functioning among Agricultural and preparatory course students.

Grade level	Adaptability	Points	Frequency	Percent	Cumulative Percent
Agricultural high school	Rigid	10-19	12	7.7	7.7
	Structured	20-24	22	14.2	21.9
	Flexible	25-28	42	27.1	49.0
	Chaotic	29-50	79	51.0	100.0
	Total		155	100	
Preparatory course	Rigid	10-19	15	8.2	8.2
	Structured	20-24	30	16.3	24.5
	Flexible	25-28	46	25.0	49.5
	Chaotic	29-50	93	50.5	100.0
	Total		184	100	

Table 4. Frequency of students according to cohesion in family functioning among Agricultural high school and preparatory course students.

Grade level	Cohesion	Points	Frequency	Percent	Cumulative Percent
Agricultural high school	Disconnected	10-34	33	21.3	21.3
	Separate	35-40	61	39.4	60.6
	Connected	41-45	43	27.7	88.4
	Amalgamated	46-50	18	11.6	100.0
	Total		155		
Preparatory course	Disconnected	10-34	39	21.2	21.2
	Separate	35-40	65	35.3	56.5
	Connected	41-45	64	34.8	91.3
	Amalgamated	46-50	16	8.7	100.0
	Total		184		

Table 5. Frequency of students according to family functioning among high school and preparatory course students.

Grade level	Functionality	Frequency	Percent	Cumulative Percent
Agricultural high school	Extreme	30	19.4	19.4
	Balanced	43	27.7	47.1
	Midrange	82	52.9	100.0
	Total	155	100.0	
Preparatory course	Extreme	24	13.0	13.0
	Balanced	45	24.5	37.5
	Midrange	115	62.5	100.0
	Total	184	100.0	

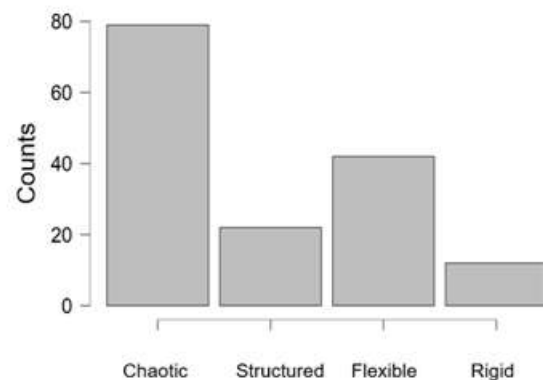
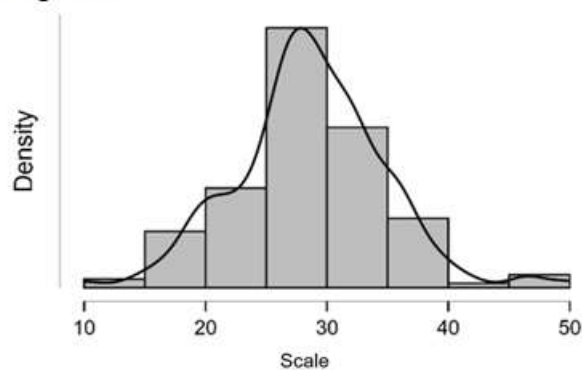
Table 6. Correlation between the average grade and the parameters of family functioning of Agricultural high school and preparatory course students.

			Pearson		Spearman	
Item			r	p	rho	p
Average grades	-	Cohesion	0.09	0.11	0.09	0.11
Average grades	-	Adaptability	-0.03	0.55	-0.02	0.79
Average grades	-	Age	-0.18**	0.001	0.00	0.94
Cohesion	-	Adaptability	0.47***	< .001	0.43***	< .001
Cohesion	-	Age	0.04	0.52	0.02	0.76
Adaptability	-	Age	0.00	0.95	0.05	0.35

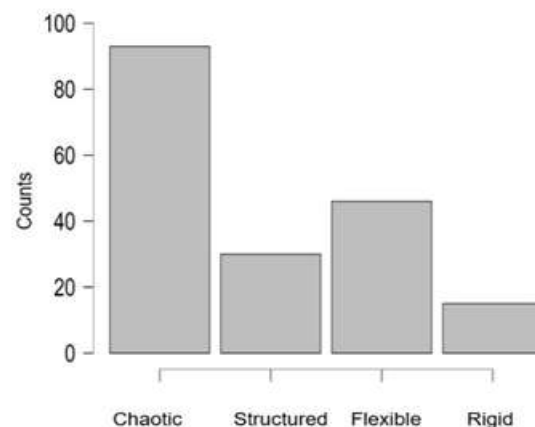
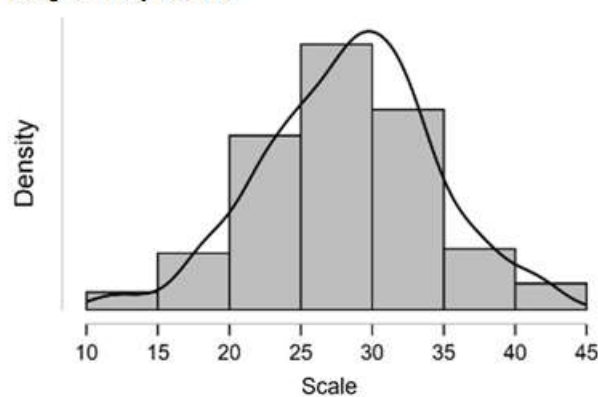
* p < .05, ** p < .01, *** p < .001

Figure 1. Distribution of Scale obtained on the adaptability item and counts by category of adaptability of Agricultural high school and preparatory course students.

High school



Preparatory course



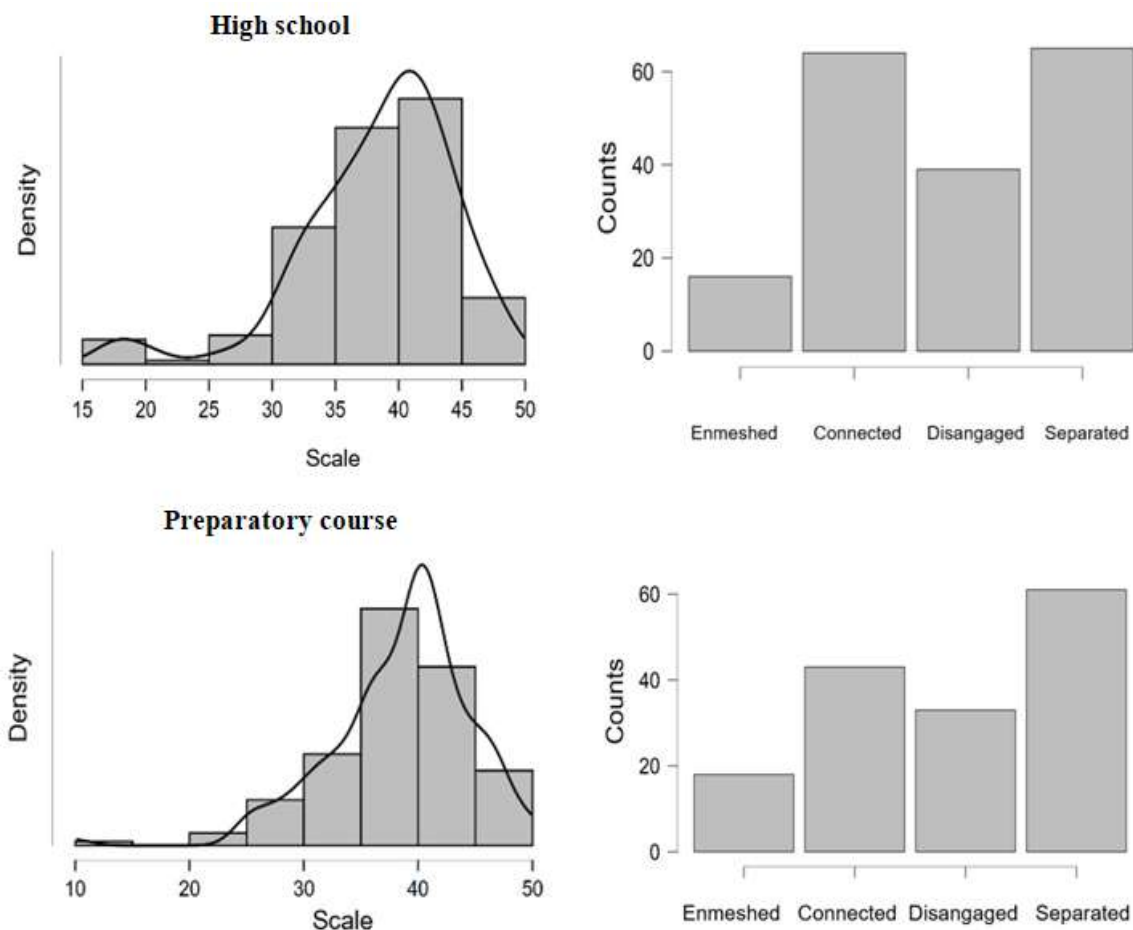


Figure 2. Distribution of scores obtained on cohesion distribution and counts by category for Agricultural high school and preparatory course students.

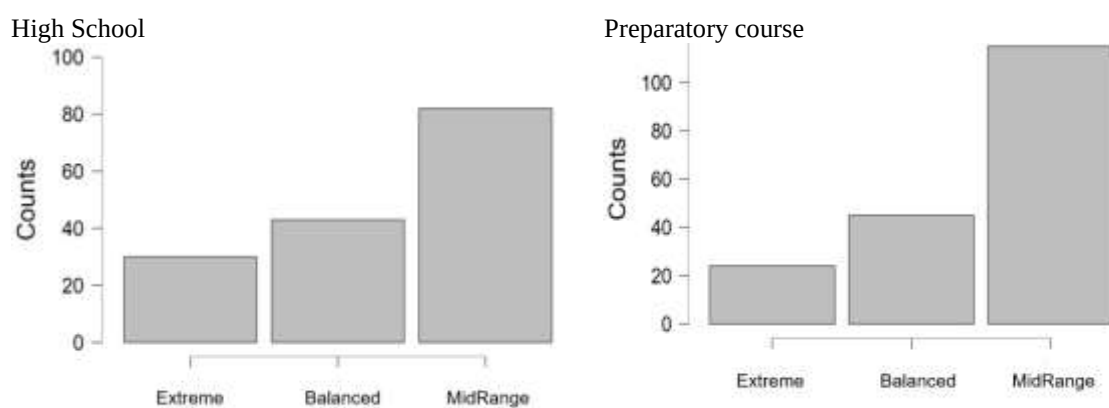


Figure 3. Family functioning scores by category for Agricultural high school and preparatory course students.