

LOGISTIC REGRESSION ANALYSIS OF SCHOOL ANXIETY AS A PREDICTOR OF SCHOOL REFUSAL

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ABSTRACT

School refusal has important repercussions on the lives of children and adolescents, seriously affecting their personal, academic, and social adjustment. Negative attitudes towards school can be caused simultaneously for several reasons and, due to the existing heterogeneity, Kearney, and Silverman (1990) grouped them into four functional conditions: I. Avoidance of school stimuli that generate negative affectivity; II. Avoidance of school situations that generate social aversion or fear of evaluation; III. Capturing the attention of significant others; and IV. Get tangible reinforcements outside of school. Given its tendency to coexist with internalizing disorders, it is essential to understand its correlation with school anxiety, which is one of the significant problems in the child and adolescent population. In this way, the present study aims to identify the probability of predictive capacity of school anxiety on high school refusal. There were 1786 participants (51% men) aged 15 to 18 years ($M_{Age} = 16.31$; $SD = 1.00$). The instruments administered were the Spanish version of the School Refusal Assessment Scale-Revised (SRAS-R-C; González et al., 2016) and the School Anxiety Inventory (IAES; García-Fernández et al., 2011). The results reveal that depending on the dimension of school anxiety evaluated, it acts as a negative or positive predictor of school refusal, also depending on the type of school refusal assessed. These findings highlight the connection between the avoidance of negative affectivity associated with school and the experience of anxiety in various school settings, emphasizing the need to address both school refusal and anxiety in the educational setting.

Keywords: logistic regression; school refusal; school anxiety; SRAS-R; IAES

RESUMEN

Análisis de regresión logística de la ansiedad escolar como predictor de rechazo escolar. El rechazo escolar tiene importantes repercusiones en la vida de niños y adolescentes, afectando gravemente a su ajuste personal, académico y social. Las actitudes negativas hacia la escuela pueden ser causadas simultáneamente por varias razones y, debido a la heterogeneidad existente, Kearney, y Silverman (1990) las agruparon en cuatro condiciones funcionales: I. Evitación de estímulos escolares que generan afectividad negativa; II. Evitación de situaciones escolares que generan aversión social o miedo a la evaluación; III. Captar la atención de otras personas significativas; y IV. Obtener refuerzos tangibles fuera de la escuela. Dada su tendencia a coexistir con trastornos internalizantes, es fundamental comprender su correlación con la ansiedad escolar, que es uno de los problemas significativos en la población infantil y adolescente. De esta forma, el presente estudio pretende identificar la probabilidad de la capacidad predictiva de la ansiedad escolar sobre el rechazo en la escuela secundaria. Participaron 1786 personas (51% hombres) con edades comprendidas entre los 15 y los 18 años ($M_{\text{edad}} = 16,31$; $DE = 1,00$). Los instrumentos administrados fueron la versión española de la Escala de Evaluación del Rechazo Escolar-Revisada (SRAS-R-C; González et al., 2016) y el Inventario de Ansiedad Escolar (IAES; García-Fernández et al., 2011). Los resultados revelan que, dependiendo de la dimensión de ansiedad escolar evaluada, ésta actúa como predictor negativo o positivo del rechazo escolar, dependiendo también del tipo de rechazo escolar evaluado. Estos hallazgos ponen de manifiesto la conexión entre la evitación de la afectividad negativa asociada a la escuela y la experiencia de ansiedad en diversos contextos escolares, enfatizando la necesidad de abordar tanto el rechazo escolar como la ansiedad en el ámbito educativo.

Palabras clave: regresión logística; rechazo escolar; ansiedad escolar; SRAS-R; IAES

INTRODUCTION

School refusal behavior (SRB) is a broad concept which is intended to integrate distinct constructs such as school phobia, separation anxiety, and various conduct-related problems (Melvin et al., 2019). Distinguishing itself from other school attendance issues, this phenomenon is characterized by a reluctance to attend school and resistance when prompted by parents. These individuals remain at home with parental awareness, experiencing emotional distress linked to school, yet displaying no antisocial behavior outside the school environment (Filippello et al., 2019).

Recent studies have identified profiles or subgroups sharing similar characteristics related to school attendance problems (SAPs), based on underlying reasons for such behaviors (González et al., 2020). The functional model, a widely recognized theoretical framework, elucidates school refusal behavior (SRB) in youth via four possible motives: (1) Avoidance of stimuli eliciting negative affectivity, (2) Escape from adverse social or evaluative situations, (3) Seeking attention from significant others, and (4) Pursuit of tangible rewards outside of school. SRB is sustained by negative reinforcement in the first two conditions, like avoiding uncomfortable school scenarios, and by positive reinforcement in the latter two, such as gaining parental attention or engaging in enjoyable activities (Kearney, 2002). High scores in the first factor typically correspond to generalized anxiety disorder (GAD), marked by persistent pleas and somatic complaints to evade school (Haight et al., 2011). The second factor correlates with GAD and social anxiety, leading to withdrawal behaviors (Carpentieri et al., 2022), while the third factor relates to separation anxiety disorder and oppositional defiant disorder (ODD) (Kearney & Albano, 2004). Lastly, students scoring high in the fourth factor are also linked to ODD (Havik & Ingul, 2021).

SRB has associations with various mental health disorders, including separation anxiety disorder, generalized anxiety disorder, oppositional defiant disorder, and depression, as well as school-related events like criticism, punishment, or ridicule (Roué et al., 2021). Anxiety, a common symptom during adolescence, is equally prevalent in school settings (Moscoso et al., 2021). Research by Chokalingam et al. (2023) indicates that anxiety disorders, particularly school-related anxiety, frequently coexist with SRB, with individuals experiencing SRB often having primary diagnoses of anxiety or mood-related disorders. Although evidence suggests a link between school

absenteeism and symptoms of school anxiety disorder, more consistent findings and longitudinal research are needed (Finning et al., 2019).

Anxiety and depression rates are increasing among children and young individuals (Madigan et al., 2023). Diagnostic interviews indicate that approximately 5–10% of individuals aged 6 to 18 years meet the diagnostic criteria for an anxiety disorder within a 12-month period (Rapee et al., 2023).

Anxiety disorders, including separation anxiety disorder, specific phobia, and school phobia, are among the most prevalent disorders in early childhood and persist into adolescence (Grieshaber et al., 2023; Legerstee et al., 2019). Consequently, recent policies have emphasized primary prevention of mental disorders (Caldwell et al., 2019). Students experiencing school anxiety fear negative judgment and criticism from others (Liao et al., 2023), leading to significant distress in various school situations, such as class participation, public presentations, and interactions with teachers (Giménez-Miralles, Lagos-San Martín & González, 2022). Elevated anxiety levels are associated with the first three factors proposed by the functional model of school refusal behavior (SRB) (Fernández-Sogorb, González & Pino-Juste, 2023). Untreated anxiety disorders can result in substantial impairments and affect various aspects of adolescents' lives, such as an increased risk of school dropout, lower academic qualifications, heightened vulnerability to bullying, reduced social connections, and less fulfilling interpersonal relationships (Alves, Figueredo & Vagos, 2022).

The literature analysis suggests a correlation between anxiety symptoms, particularly school anxiety, and school refusal behavior (SRB). Therefore, this study focuses on this relationship using a sample of Ecuadorian adolescents, aiming to provide new empirical evidence. The research utilizes the School Refusal Assessment Scale-Revised for Children (SRAS-R) (Kearney, 2002) and the Inventory of Anxiety and Excitement in Students (IAES) (García-Fernández et al., 2011).

The objective is to analyze the logistic regression of school anxiety as a predictor of high scores on school refusal.

METHOD

Sample

To conduct this study, the research adopts a descriptive, quantitative, and exploratory design based on primary sources. Several considerations were considered for this research, including the requirement for public educational institutions and their locations spread across different parts of the city, namely 'the north,' 'the center,' and 'the south.' The population sample selection employed random cluster sampling, resulting in the inclusion of 1920 students aged from 15 to 18, enrolled in three public educational institutions.

Out of the initial sample, 134 participants were excluded: 71 (3.69%) due to insufficient informed consent and 63 (3.28%) due to omissions in their responses. Thus, the final sample comprised 1786 participants ($M = 16.31$; $SD = 1.00$), with 51.0% being male.

The Chi-square test for homogeneity of frequency distribution indicated no statistically significant differences among the six age-sex groups ($\chi^2 = .41$; $p = .81$).

Instruments

School Refusal Assessment Scale Revised for Children

The SRAS-R-C (Kearney, 2002) is a 7-point Likert-type assessment instrument (0 = Never; 6 = Always), consisting of 24 items designed to measure various manifestations of school refusal in children and adolescents. It aims to assess self-perception in relation to four factors that explain the underlying motivations for school refusal: avoiding the negative affectivity associated with school, seeking attention from significant others, and pursuing tangible reinforcement outside the school context (Kearney, 2006). The Spanish version of this scale has shown reliability levels ranging from .70 to .87 for the different factors of the SRAS-R-C (González et al., 2016).

Inventory of School Anxiety

The Inventory of School Anxiety (IAES; García-Fernández et al., 2011) is a self-report measure comprising 23 items with 5-point Likert-type responses (0 = Never; 4 = Always), addressing 20 manifestations (9 cognitive, 5 behavioral, and 5 psychophysiological) to evaluate school anxiety experienced during adolescence across various situations. Its situational factors encompass: I. Anxiety about school failure and punishment with 8 items; II. Anxiety about social evaluation comprising 5 items; III. Aggression anxiety containing 6 items; and IV. Anxiety about school assessment including 4 items. The scale is administered using a double-entry table, where the school situation is displayed on the horizontal axis, and responses indicating cognitive, behavioral, and psychophysiological manifestations are shown on the vertical axis. Reliability levels were satisfactory for the four situational factors (α = between .83 and .92), as well as for the three types of anxiety (α = between .82 and .86) (García-Fernández et al., 2011).

Procedure

To start the research, preliminary interviews with school management were conducted to explain the study's purpose, objectives, and procedures, and to assure privacy. We sought their cooperation and thanked them in advance. Written informed consent from participants' legal representatives was obtained, followed by the administration of tests. We held a pre-meeting with teaching staff to secure their support and ensure adherence to the timetable. Participants were briefed on the study's purpose, ensuring ethical standards were met. Completing the questionnaires took about 60 minutes, with participation being voluntary and anonymous.

Data analysis

Logistic regression was utilized to analyze the influence of certain variables on levels of school refusal, employing a forward stepwise procedure based on the Wald statistic. This method sequentially adds variables contributing most to the model's predictive power.

Additionally, a binary logistic regression approach, utilizing a stepwise regression procedure based on the Wald statistic, was employed to examine the predictive capability of school refusal on high social anxiety. The odds ratio (OR) statistic was utilized to interpret the results, with scores > 1 indicating a positive prediction, scores < 1 suggesting negative prediction, and scores = 1 indicating no prediction. All statistical analyses were conducted using SPSS 28 software.

RESULTS

Predictive ability of school anxiety on high scores in Factor I of the SRAS-R-C

Using the collected data, a logistic regression model was developed to predict the likelihood of obtaining high scores on Factor I of the SRAS, associated with avoiding negative affectivity related to school stimuli or situations, based on School Anxiety variables (refer to Table 2).

The proposed model achieved an accuracy of 69.5% in predicting cases ($\chi^2=23.95$; $p=.27$), with a model fit value (R^2 Nagelkerke) of .26. The Odds Ratio (OR) values exceeding 1 for the variables FIV IAES and Behavioural Anxiety suggest that the likelihood of experiencing high school refusal increases by 1.01 times for each point the score on these variables rises. Additionally, OR values equal to 1 were observed for the Total IAES variable, indicating that the probability of high school refusal in relation to the first factor remains unchanged for each point the score on this variable increases. Conversely, OR values below 1 were obtained for the variables FII IAES and FIII IAES, signifying that the probability of high school refusal for factor I decreases by .98 times for each point the score in the FII IAES variable increases, and by .99 times for each point the score in the FIII IAES variable increases.

Table 2. Binary logistic regression for the probability of having a high score on Factor I of the SRAS as a function of the school anxiety variable.

Variable	χ^2	R ²	B	E.T.	Wald	p	OR	I.C. 95%
	Correctly classified: 69.5%	23.95	.26					
FII IAES			-.02	.01	12.299	.000	.98	.97 – .99 .98
FIII IAES			-.01	.01	.362	.548	.99	– 1.00 1.00
FIV IAES			.01	.01	3.637	.057	1.01	– 1.02 1.00
Behavioural anxiety			.02	.01	6.542	.011	1.01	– 1.02 1.00
Total IAES			.01	.01	5.762	.016	1.00	– 1.01
Constant			- 1.29	.17	52.191	.000	.27	

Predictive ability of school anxiety to predict high scores on Factor II of the SRAS-R-C

Based on the collected data, a logistic regression model has been constructed to provide reliable estimates of the likelihood of obtaining high scores on Factor II of the SRAS, which pertains to the escape from social aversion or evaluation situations, based on the School Anxiety variables (see Table 3).

The proposed model achieved an accuracy of 72.3% in predicting cases ($\chi^2=23.95$; $p = .001$), with a model fit value (R² Nagelkerke) of .26. The Odds Ratio (OR) values exceeding 1 for the variables FI IAES indicate that the likelihood of experiencing high school refusal in relation to the second factor increases by 1.01 times for each point the score on this variable rises. Similarly, for Psychophysiological anxiety and Behavioral anxiety, the OR values greater than 1 signify that the probability of high school refusal in relation to the second factor is 1.01 and 1.03 times higher, respectively, for each point the score on these variables increases. Conversely, OR values below 1 were observed for the variables FII IAES and Total IAES, suggesting that the probability of high school refusal for factor II decreases by .98 and .94 times, respectively, for each point the score on these variables increases.

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Table 3. Binary logistic regression for the probability of having a high score on Factor II of the SRAS as a function of the school anxiety variable.

Variable	χ^2	R ²	B	E.T.	Wald	p	OR	I.C. 95%
	Correctly classified: 72.3%	23.95	.26					
FI IAES			.01	.01	12.93	< .001	1.01	1.00 – 1.02
FII IAES			-.01	.01	41.11	< .001	.98	-.98 – .99
Psychophysiological Anxiety			.01	.01	8.32	.004	1.01	1.00 – 1.02
Behavioural Anxiety			.03	.01	28.41	< .001	1.03	1.01 – 1.04
Total IAES			-.60	.17	11.89	.001	.94	.92 – .96
Constant			.01	.01	12.93	< .001	1.01	

Predictive ability of school anxiety on high scores on Factor III of the SRAS-R-C

Based on the collected data, a logistic regression model has been constructed to provide accurate estimates of the likelihood of obtaining high scores on Factor III of the SRAS-R-C, which pertains to seeking the attention of significant others, based on the School Anxiety variables (see Table 4).

The proposed model achieved an accuracy of 64.3% in predicting cases ($2=95.89; p = .001$), with a model fit value (R^2 Nagelkerke) of 0.12. The Odds Ratio (OR) values exceeding 1 for the variables FIV IAES indicate that the likelihood of experiencing high school refusal in relation to the third factor increases by 1.01 times for each point the score on this variable rises. Similarly, for Behavioral Anxiety, the OR value greater than 1 suggests that the probability of presenting high school refusal in relation to the third factor is 1.02 times higher for each point the score on this variable increases.

Table 4. Binary logistic regression for the probability of having a high score on Factor III of the SRAS as a function of the school anxiety variable

Variable	χ^2	R ²	B	E.T.	Wald	p	OR	I.C. 95%
	Correctly classified: 64.3%	95.89	.12					
FIV IAES			.01	.01	10.26	.001	1.01	1.01 – 1.02
Behavioural anxiety			.02	.01	16.32	< .001	1.02	1.01 – 1.03
Constant			-.76	.15	26.64	< .001	.46	

Predictive ability of school anxiety to predict high scores on Factor IV of the SRAS-R-C

From the data collected, a logistic regression model has been developed that allows for adequate estimates of the probability of high scores on Factor IV of the SRAS (Seeking Tangible Out-of-School Reinforcement) as a function of school anxiety variables (see Table 5).

The proposed model achieved an accuracy of 64.2% in predicting cases ($\chi^2=22.40$; $p = .001$), with a model fit value (R^2 Nagelkerke) of .03. Regarding the Odds Ratio (OR), values greater than 1 were observed for the variable FII IAES, indicating that the likelihood of experiencing high school refusal in relation to the fourth factor increases by 1.01 times for each point the score on this variable rises. Conversely, OR values below 1 were obtained for the variable FI IAES, suggesting that the probability of presenting high school refusal for factor IV decreases by .99 times for each point the score on this variable increases.

Table 5. Binary logistic regression for the probability of having a high score on Factor IV of the SRAS as a function of the school anxiety variable.

Variable	χ^2	R^2	B	E.T.	Wald	p	OR	I.C. 95%
Correctly classified: 64.2%	22.40	.03						
FI IAES			-.01	.01	21.53	<.001	.99	.98 – .99
FII IAES			.01	.01	9.39	.002	1.01	1.00 – 1.01
Constant			.57	.18	10.59	.001	1.77	

DISCUSSION AND CONCLUSIONS

The aim of this study was to examine logistic regression, focusing on school anxiety as a predictor of high scores in school refusal. According to our findings, it can be asserted that as scores on social evaluation anxiety (FIV IAES), Behavioral anxiety, and the Total school anxiety questionnaire, the likelihood of exhibiting high scores in school refusal concerning this factor increases. Conversely, higher scores on the variables social evaluation anxiety (FII IAES) and anxiety regarding failure and disciplinary sanctions (FIII IAES) are associated with a diminished probability of high scores on this factor.

These findings underscore the relationship between avoidance of school-related negative affectivity and the manifestation of anxiety across various school settings, emphasizing the significance of addressing both school refusal and anxiety within the educational sphere.

The connection between avoidance of school-related negative emotions and anxiety may stem from individuals evading situations that trigger fear of failure, punishment, aggression, and evaluation. This avoidance can increase anxiety and contribute to school refusal, supporting the idea of comorbid disorders (Gómez-Núñez et al., 2017; Inglés et al., 2015; Kearney & Albano, 2004). Current research often focuses on pathological anxiety, highlighting the need for future studies to explore the relationship between school refusal and school anxiety.

It is essential to acknowledge that most studies have approached anxiety from a pathological perspective. These limitations underscore the necessity for future research to delve into the variables proposed in this study, particularly the interplay between school refusal and school anxiety.

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