Behavioral Psychology / Psicología Conductual, Vol. 30, Nº 3, 2022, pp. 641-661
https://doi.org/10.51668/bp.8322303n

ANTISOCIAL BEHAVIOR OF SPANISH ADOLESCENTS: PREVALENCE AND RELATIONSHIP WITH THEIR PERCEIVED GLOBAL HEALTH

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Abstract

Engagement in antisocial behavior during adolescence is a controversial issue causing social concern and with implications for the adolescents. This research is based on data from the 2014 Health Behavior in School-aged Children (HBSC) study and aims to determine the prevalence rate of antisocial behavior in 11-16-year-old adolescents and examine the relationship between antisocial behavior and perceived global health. The sample is composed of 9775 adolescents enrolled in school in Spain (50.95% girls). Results show a similar prevalence for boys and girls in all categories except in destruction, which is more prevalent in boys. However, discrepancies were found in the prevalence of engaging in antisocial behavior according to age, with a higher prevalence in older age groups. It was found that lesser antisocial acts are associated with a worse health score at all ages regardless of sex, justifying the need to carry out preventive interventions and tackle the circumstances that promote antisocial behavior.

KEY WORDS: *antisocial behavior, adolescence, prevalence, wellbeing, health, age, sex*.

Resumen

La participación en conductas antisociales en la adolescencia es un tema controvertido que causa preocupación social y tiene implicaciones en los propios adolescentes. Este artículo trabaja con los datos del estudio *Health Behaviour in School-aged Children* (HBSC) de 2014 y tiene como objetivos conocer la prevalencia de conducta antisocial de baja gravedad en adolescentes entre 11 y 16 años, y estudiar la relación entre la conducta antisocial y la salud global percibida. La muestra fue de 9775 adolescentes escolarizados en España (50,95% chicas). Los chicos y chicas presentaron prevalencias de conducta antisocial similares en todas las categorías, excepto en la categoría "destrozo", más prevalente en chicos. Sin embargo, se encontraron discrepancias en la prevalencia de la participación en conducta antisocial en función de la edad, con una mayor prevalencia en los grupos de mayor edad. Se encontró que cometer actos antisociales de baja gravedad se relaciona con una peor puntuación en salud en todas las edades

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independientemente del sexo, justificando la necesidad de realizar intervenciones preventivas y atajar las circunstancias que promueven la conducta antisocial.
PALABRAS CLAVE: c*onducta antisocial, adolescencia, prevalencia, salud, edad, sexo*.

Introduction

Calculating the prevalence of engagement in antisocial behaviors is one of the principal challenges facing researchers in this field given that basic factors -such as the definition of the term or demographic characteristics of the sample- can cause variations in the data, as will be explained below.

Firstly, it is imperative that research on prevalence clarify both the definition and delimitation of antisocial behavior with respect to other concepts often used synonymously. According to Kazdin and Buela-Casal (2006), "antisocial behavior will be used to broadly refer to any behavior that infringes on social rules and/or is an action against others" (p. 19). This definition is shared by other national studies such as Antolín (2011), Peña (2005) or Sanabria and Rodríguez (2009), as well as international studies such as Burt (2012), which defines antisocial behavior as actions that violate social norms or the rights of others. In addition, this author defends that the lack of specificity in the term's definition causes contradictory prevalence data.

Part of the confusion is due to the diversity of conducts that the concept antisocial behavior encompasses, such as aggressive or delinquent conduct, or behavioral disorders.

There is certain consensus in recognizing the diversity of behaviors that this term encompasses (Antolín, 2011; Burt, 2012, Dodge et al., 2006; Gatzke-kopp et al., 2013; Loeber & Schmaling, 1985; Peña, 2005; Rutter et al., 2000). However, discrepancies exist regarding the specific behaviors that constitute antisocial behavior and how to group them. In fact, grouping or segregating antisocial behaviors in different ways could explain the apparently contradictory findings (Vitaro et al., 2006). Another obstacle in defining antisocial behaviors relates to the social and cultural contexts, given that the term antisocial behavior depends on the characteristics of the social environment of reference, i.e., a behavior that is objectionable in a certain context may be normalized in another (Kazdin & Buela-Casal, 2006).

Secondly, as previously mentioned, sex and age differences constitute another challenge when calculating and comparing the prevalence rates of adolescent antisocial behavior. The inconsistent results found in different research as to the prevalence of antisocial behavior and sex differences are testament to this problem. Research with a Spanish sample evinces that over 89% of youth engage in some antisocial behaviors, with boys being more involved (Antolín, 2011). In this regard, Serrano et al. (1996), and Silva dos Santos et al. (2019) have also identified important sex differences in the frequency of engaging in antisocial behaviors, highlighting that boys are more involved. However, other research, such as that by Bringas et al.

(2006) or Garaigordobil (2005) found no differences between boys and girls in engaging in antisocial behaviors. Burt et al. (2018) explain these inconsistencies amongst different studies by emphasizing the informant's moderator role and the impact of contextual and family differences. Conversely, Vitaro et al. (2006) stress the importance of data handling -grouping or segregating into different categories- in their justification for contradictory findings.

Therefore, considering the current state of research in this area, the first aim of this study is to determine the prevalence of antisocial behavior in Spanish adolescents enrolled in school. As Yung and Hammond (1997) point out, antisocial-behavior research depends on local and regional studies, which do not reliably estimate the magnitude of these problems nor capture the behavioral patterns of most youth. Therefore, this national study will focus specifically on low-severity antisocial behaviors, being the most common. In addition, considering the importance of the concept's definition when calculating prevalence, this research proposes conducting analyses by type (theft, destruction, disobeying authority) and context (in or out of school), as well as controlling key demographic characteristics (sex and age).

Moreover, another relevant and less-researched topic in the field of antisocial behavior deals with the health implications for adolescents partaking in antisocial acts. According to DiClemente et al. (2013), evidence shows that youth who are involved in risk behaviors -such as antisocial behavior- have a higher probability of engaging in other risk behaviors that could jeopardize their health, i.e. smoking or substance use. In addition, this association seems to be bidirectional since, as DiClemente et al. (2013) points out, adolescents experiencing more psychological or mental health issues have a higher likelihood of engage in risk behaviors.

Nonetheless, a literature review on the relationship between antisocial behavior and psychological health has offered inconclusive results. Kort-Butler (2017) found association between stress and delinquent behavior in adolescents, however Vermeiren et al. (2002) found association between antisocial behavior and depression, somatization, and negative expectations regarding the future, but not with anxiety. A recent study with adolescents found no relationship between antisocial behavior and depression, and attributes the association identified in other research to common predictors in both manifestations (Heerde et al., 2019).

Regarding sex differences, Ritakallio et al. (2007) found that depression predicts antisocial behavior within a two-year period for girls, however it appears to protect boys from committing subsequent antisocial acts. Moffit et al. (2001) thoroughly researched sex differences in antisocial behavior, determining that it affects males and females differently. Whereas antisocial behavior in males associates with more problems in social adjustment, such as finding work, in females it associates with physical and psychological problems, such as depression. In addition, the authors emphasize the need for further research on sex differences in the relationship between health and antisocial behavior.

Concerning physical health, some authors find that antisocial behavior in adults is associated with poorer health, such as cardiovascular and respiratory problems (Paradis et al., 2016). Nonetheless, the results are questionable as certain studies identify a relationship between antisocial lifestyles and more psychological injuries and disorders, however a lower presence of natural illnesses before age 32 (Shepherd et al., 2004). As the authors emphasize, little is known about the overall impact of antisocial behavior on health.

Therefore, the second aim of this study is to examine the relationship between the adolescents' perceived global health and the number of low-severity antisocial behaviors in which they have engaged, differentiating between type of behavior (theft, destruction, or disobeying authority), and context (in or out of school), examining sex and age differences.

Method

Participants

This research was conducted using data from the 2014 Spanish edition of the *Health Behaviour in School-aged Children* (HBSC) international study. Following the methodological guidelines, participants were selected using random multistage sampling stratified by conglomerates, using autonomous region, habitat (rural or urban), age (11-18-years-old) and type of school (public or private) as strata. More information about the HBSC study can be found in Moreno et al. (2016).

Considering that different versions of the questionnaire were used according to content and age, the sample for the present research is comprised of 9775 adolescents 11-16-years-old, whose questionnaire included the questions related to antisocial behavior. The sample is distributed as follows: 49.05% boys and 50.95% girls; 31.01% 11-12 years-old, 34.68% de 13-14 years-old, and 34.31% 15-16 years-old.

Instruments

a) *Bergen Questionnaire on Antisocial Behaviour* (Bendixen & Olweus, 1999). This questionnaire evaluates antisocial behavior. Specifically, the 10 high-prevalence items were selected, i.e., the ten less-severe behaviors. "*1. Avoided paying for such things as movies, bus or train ride, or food?; 2. Scribbled on the school building, outside or inside, or on things belonging to your school?; 3. Stolen money or other things from members of your family?; 4. Cursed at a teacher?; 5. Taken things worth less than 20-25 euros from a store without paying?; 6. Skipped one or two lessons?; 7. Purposely destroyed or broken such things as windows, benches, telephone booths, or mailboxes?; 8. Without permission taken a bicycle or a moped that did not belong to you?; 9. Skipped school a whole day?: 10. Had a violent quarrel with a teacher?"*. The following criteria

was used to classify the 10 items: 1) Action outcome, differentiating between theft (items 1, 3, 5, 8), destruction of objects or places (items 2, 7), and disobeying authority or rebelliousness (items 4, 6, 9, and 10); y 2) Action context, differentiating between antisocial behaviors at school (items 2, 4, 6, 8, 10) versus other contexts (items 1, 3, 5, 7, 8). The response options were: *never, once,* and *two or more times*.

b) Global score of perceived health. A global health score was used based on 20 items that collected information regarding life satisfaction (Cantril, 1965), self-perception of health (Idler & Benyamini, 1997), health-related quality of life (Ravens-Sieberer et al., 2001), and psychosomatic symptoms (Ravens-Sieberer et al., 2008). The International Journal of Public Health published a supplement in 2009 analyzing the HBSC study throughout 25 years (Ravens-Sieberer et al., 2009) and summarizing the evaluation instruments used in our research, including the validity of the health measures (Erhart et al., 2009; Ravens-Sieberer et al., 2009). This review specifically demonstrates the reliability and precision of the four variables used to create this global health score, described in detail below: 1) "Cantril Ladder (1965), that evaluated life satisfaction with values between 0 and 10, which represent the overall perception that the adolescents have of their lives, with 0 being the lowest and 10 the highest life-satisfaction. 2) *Kidscreen-10* (Ravens-Sieberer & The European Kidscreen Group, 2006), which evaluated health-related quality of life in children and adolescents between 8-18-year-olds. It provides a global index of health-related quality of life through 10 items addressing physical, psychological, and social aspects (Ravens-Sieberer et al., 2001). These items refer to feeling fit and well, full of energy, sad, lonely, have enough time for oneself, doing what one wants in their free time, being treated fairly by parents, have fun with friends, do well in school, and be able to pay attention. The Cronbach alpha was .819. 3) A single item about self-reported health that asked how the adolescents currently viewed their health. The response options were *excellent, good, passable,* or *poor* (Idler & Benyamini, 1997). This measure has been validated for use in quantitative research (Silventoinen et al., 2007). And 4) *HBSC symptom checklist* (Ravens-Sieberer et al., 2008). This list measures two aspects: psychological symptoms (nervousness, depression, irritability, and trouble sleeping) and somatic symptoms (headaches, stomachache, back-ache, and dizziness). The Cronbach alpha was .802. The global score, based on these four instruments, refers to the adolescents' perception of their own physical, psychological, and social health or wellbeing, according to the definition of health proposed by the World Health Organization (WHO, 1948). The global health shore showed good fit indices (NNFI= 0.98, CFI= 0.99, RMSEA= 0.03), as well as good reliability and validity criteria.

Procedure

Data-collection preparation began by contacting the selected schools. An informative brochure about the study as well as specific participation instructions were emailed to the schools that agreed to participate. In addition, they were provided with an informed-consent form for the families, in the event that the school lacked their own system.

Data collection strictly followed the HBSC international guidelines (Inchley et al., 2016): the adolescents answered the questionnaires individually; anonymity was guaranteed; and the questionnaire was administered at school, during school hours, under staff supervision. The adolescents were also informed that they could terminate the questionnaire whenever they wished.

A digital version of the questionnaire -which the adolescents accessed online using school computers- was used in this edition. If internet access was unavailable the research team provided the school with tablets on which the adolescents could fill out the questionnaire. This questionnaire abides by the international protocol and was approved by the University of Sevilla Experimental Ethics Committee.

Data analysis

Statistical analyses were conducted using SPSS 19.0. For the significance tests, Chi-squared (χ^2) was used to compare the prevalence of engagement in antisocial behaviors, and one-factor ANOVA was employed to analyze the relationship between the number of antisocial behaviors in which they engaged and their perceived global health.

Effect-size tests were conducted to determine the degree, direction, and importance of the results of the statistical significance tests (Valera & Sánchez, 1997) and to avoid Type I or alpha errors, which lead to mistakenly reject the null hypothesis due to a large sample size (Shaughnessy et al., 2007).

Three effect-size tests were used depending on the variables' characteristics. For the relationship between two qualitative variables (participation/non-participation in antisocial behaviors and sex), *phi* coefficient was used (when both variables had two response values) or Cramer's *V* (when at least one variable had more than two response values, for example age). The intervals in both cases were: 0-.09, negligible; .10-.29, low; .30-.49 medium; and .50 or higher, large effect size (Abdi, 20 07; Agresti, 1996). Cohen's *d* was used for the relationship between a quantitative and a qualitative variable, i.e., perceived health and group according to the number of behaviors in which they have engaged. The following criteria were followed: 0-0.19, negligible; 0.20-0.49, low; 0.50- 0.79, medium; and 0.80 or higher, large effect size (Cohen, 1988; Huberty, 2002).

It is important to note that the items were coded according to participation in an item of each category in order to provide prevalence data on antisocial behavior, i.e., the response options "once" and "twice or more" were grouped together, thus

creating two groups: 1) those that engaged at one time or another in some antisocial behavior; and 2) those who have never engaged in any antisocial behavior.

Results

Prevalence of antisocial behavior according to sex, age, and the combination of the two

Analysis of overall prevalence revealed that just under half of the adolescents had participated in at least one antisocial behavior since the beginning of the academic year. Regarding classification by action outcome, disobeying authority was the most prevalent type of conduct, followed by theft, and lastly destruction. Differences according to action context clearly showed a higher prevalence of school compared to other contexts.

As shown in Table 1, the prevalence of boys who participated in at least one antisocial behavior of each category is always higher than girls. Although statistical significance tests indicate differences in prevalence according to sex, their negligible effect sizes lead us to dismiss these results (*phi*< .10), except for destructive behavior which shows a low effect size (*phi*= -.10). Regarding age differences, an increase is observed in all the categories -according to both action outcome as well as context -as the adolescent's age increases.

Table 1
Prevalence of antisocial behavior according to sex and age

Variable	Total	Sex			Age group			
		Boy	Girl	*p* (*phi*)	11-12	13-14	15-16	*p* (*V*)
	n= 9775	*n*= 4795	*n*= 4980		*n*= 3031	*n*= 3390	*n*= 3354	
Overall prevalence	48.38%	51.32%	45.54%	<.001 (-.06)	26.13%	49.39%	67.26%	<.001 (.33)**
Action outcome								
Theft	26.70%	30.30%	23.25%	<.001 (-.08)	14.73%	27.62%	36.65%	<.001 (.20)*
Destruction	14.00%	17.34%	10.77%	<.001 (-.10)*	6.70%	15.40%	19.18%	<.001 (.15)*
Disobedience	40.77%	43.48%	38.15%	<.001 (-.05)	18.93%	40.86%	60.07%	<.001 (.34)**
Action context								
School	41.94%	44.56%	39.40%	<.001 (-.05)	19.92%	42.34%	61.11%	<.001 (.34)**
Other	27.67%	31.60%	23.90%	<.001 (-.09)	15.10%	28.71%	38.04%	<.001 (.21)*

Notes: *phi/Cramer´s *V* low; **phi/Cramer´s *V* médium; ***phi/Cramer´s *V* high. Percentages represent the presence of each antisocial behavior, omitting values of non-presence which correspond to the difference to 100%.

The results of antisocial behavior combining sex and age (Table 2) are unclear due to the negligible effect size in almost all comparisons. A null association is observed in all categories of analyses except for destruction of objects or places in the 15-16-year-old age group, showing a higher frequency in boys (*phi*= -.14).

Table 2
Prevalence of antisocial behavior combining sex and age

Variable	11-12 years		*p* (*phi*)	13-14 years		*p* (*phi*)	15-16 years		*p* (*phi*)
	Boy	Girl		Boy	Girl		Boy	Girl	
	n= 1470	*n*= 1561		*n*= 1670	*n*= 1720		*n*= 1655	*n*= 1699	
Overall prevalence	30.31%	22.20%	<.001 (-.09)	52.18%	46.63%	.002 (-.06)	68.97%	65.61%	.044(-.04)
Action outcome									
Theft	17.31%	12.30%	<.001 (-.07)	31.56%	23.80%	<.001 (-.09)	40.64%	32.79%	<.001 (-.08)
Destruction	7.77%	5.68%	.022 (-.04)	18.56%	12.33%	<.001 (-.09)	24.65%	13.86%	<.001 (-.14)*
Disobedience	22.63%	15.45%	<.001 (-.09)	43.29%	38.47%	.005 (-.05)	61.82%	58.37%	.043 (-.04)
Action context									
School	23.45%	16.59%	<.001 (-.09)	44.70%	40.01%	.007 (-.05)	62.83%	59.44%	.047 (-.04)
Other	17.95%	12.41%	<.001 (-.08)	33.01%	24.54%	<.001 (-.09)	42.45%	33.80%	<.001 (-.09)

Notes: *phi low; **phi medium; ***phi high. Percentages represent the presence of each antisocial behavior, omitting values of non-presence which correspond to the difference to 100%.

Association between antisocial behavior and perceived global health

As can be observed in Table 3 -displaying the mean global heath score related to number of antisocial behaviors- data from the overall sample shows a decrease in health as the number of antisocial behaviors increases. These results are present in all categories except destruction in which, as an exception, adolescents who participate in only one destructive behavior show higher values than those participating in two or more. The one-factor ANOVA results (Table 4) with the global data (without differentiating sex nor controlling for age), show significant differences in the mean global health score (p< .05) between groups (0 behaviors, 1 behavior, and 2 or more behaviors). All categories offer similar results except in the mean comparison between one and two or more destructive antisocial behaviors (p= 390).

Table 3
Means and standard deviations in the global score of perceived health according to the number of antisocial behaviors in which they engaged

Variable	Number of behaviors	Global		11-12 years				13-14 years				15-16 years			
				Boys		Girls		Boys		Girls		Boys		Girls	
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Overall prevalence	0	9.07	1.26	9.55	1.18	9.49	1.10	9.20	1.18	8.78	1.17	8.82	1.36	8.33	1.24
	1	8.51	1.27	9.13	1.21	8.88	1.26	8.84	1.11	8.41	1.34	8.55	1.05	7.86	1.23
	2 or more	8.03	1.37	8.67	1.38	8.42	1.50	8.44	1.30	7.68	1.45	8.18	1.18	7.53	1.31
Action outcome															
Theft	0	8.81	1.34	9.43	1.21	9.37	1.17	9.03	1.20	8.60	1.29	8.58	1.30	8.03	1.29
	1	8.30	1.32	9.05	1.34	8.81	1.45	8.68	1.17	8.10	1.41	8.33	1.11	7.74	1.24
	2 or more	8.10	1.47	8.57	1.58	8.45	1.63	8.36	1.49	7.63	1.58	8.25	1.20	7.42	1.45
Destruction	0	8.74	1.35	9.39	1.23	9.36	1.18	8.99	1.21	8.55	1.30	8.54	1.27	7.96	1.31
	1	8.09	1.30	8.75	1.32	8.32	1.47	8.40	1.21	7.82	1.45	8.24	1.11	7.50	1.19
	2 or more	8.22	1.55	8.77	1.74	8.50	1.74	8.51	1.53	7.55	1.53	8.24	1.27	7.63	1.65
Disobeying authority	0	9.02	1.27	9.53	1.19	9.46	1.14	9.16	1.19	8.76	1.18	8.78	1.30	8.25	1.25
	1	8.29	1.27	8.83	1.17	8.60	1.29	8.61	1.18	8.15	1.35	8.43	1.14	7.83	1.22
	2 or more	7.96	1.40	8.66	1.46	8.44	1.51	8.40	1.34	7.51	1.51	8.12	1.17	7.39	1.32
Action context															
School	0	9.03	1.27	9.53	1.19	9.47	1.12	9.18	1.18	8.77	1.18	8.79	1.30	8.26	1.26
	1	8.34	1.27	8.91	1.19	8.77	1.28	8.64	1.18	8.21	1.33	8.45	1.15	7.87	1.22
	2 or more	7.97	1.39	8.63	1.43	8.35	1.48	8.40	1.32	7.57	1.50	8.14	1.17	7.39	1.31
Other	0	8.82	1.33	9.43	1.21	9.38	1.17	9.04	1.20	8.60	1.28	8.59	1.30	8.05	1.29
	1	8.29	1.32	9.05	1.36	8.79	1.43	8.68	1.17	8.15	1.39	8.29	1.13	7.72	1.24
	2 or more	8.14	1.45	8.65	1.52	8.50	1.60	8.44	1.43	7.60	1.57	8.28	1.18	7.43	1.44

Table 4 shows the statistical significance and effect size of all comparisons from Table 3. Considering the three-level classification of participation in antisocial behaviors (0, 1, and 2 or more behaviors), comparisons were made between pairs of groups (0-1, 0-2+, 1-2+). In general, results show an appreciable effect size for almost all comparisons.

To help understand the different patterns that can be found in the association between number of antisocial behaviors and perceived global heath -both in the overall sample and in that segregated by sex and age-, four possible association patterns were established: A) no health decrease according to antisocial behavior, i.e., no statistically significant differences were found and/or, if found, they did not have a noticeable effect size; B) a progressive decrease in health or significant differences with a noticeable effect size amongst all groups according to number of behaviors; C) a health decrease at low-levels of antisocial behavior or significant differences with an effect size between the 0- behavior group and the 1-behavior group, but without significant differences and without effect size amongst the 1-behavior group and the two-or-more behaviors group; and D) a health decrease at high levels of antisocial behavior, i.e., no significant differences or with a noticeable effect size between the global heath score of those in 0-behavior group and the 1-behavior group, but with significant differences and with an effect size between the 1-behavior group and the two-or-more behaviors group.

Table 4

Summary of the significance tests and effect size between the different groups of engagement in antisocial behavior and their perceived global health score

Variable	Number of behaviors	Global		11-12 years				13-14 years				15-16 years			
				Boys		Girls		Boys		Girls		Boys		Girls	
		p	*d*	*p*	*d*	*p*	*d*	*p*	*d*	*p*	*d*	*p*	*d*	*p*	*d*
Overall prevalence	0 - 1	<.001	.44*	<.001	.36*	<.001	.55**	<.001	.31*	<.001	.30*	.007	.22*	<.001	.37*
	0 - 2	<.001	.79**	<.001	.72**	<.001	.94***	<.001	.62**	<.001	.88***	<.001	.51**	<.001	.62*
	1 - 2	<.001	.36*	.002	.36*	.009	.34*	<.001	.32*	<.001	.53**	<.001	.32*	<.001	.26*
Action outcome															
Theft	0 - 1	<.001	.38*	.008	.31*	<.001	.47*	<.001	.29*	<.001	.38*	.005	.20*	<.001	.23*
	0 - 2	<.001	.53**	<.001	.69**	<.001	.78**	<.001	.54**	<.001	.74**	<.001	.25*	<.001	.47*
	1 - 2	.002	.15	.022	.33*	.383	.24*	.013	.25*	.009	.33*	1.00	.07	.026	.24*
Destruction	0 - 1	<.001	.48*	.001	.52**	<.001	.87***	<.001	.49*	<.001	.55**	.003	.24*	<.001	.36*
	0 - 2	<.001	.39*	.003	.49*	.001	.72**	<.001	.39*	<.001	.76**	.023	.24*	.129	.25*
	1 - 2	.390	-.09	1.00	-.01	1.00	-.11	1,00	-.08	.608	.19	1,00	.00	1,00	-.10
Disobeying authority	0 - 1	<.001	.57**	<.001	.59**	<.001	.74**	<.001	.47*	<.001	.50**	<.001	.28*	<.001	.34*
	0 - 2	<.001	.81***	<.001	.71**	<.001	.87***	<.001	.62**	<.001	1,00***	<.001	.53**	<.001	.67**
	1 - 2	<.001	.25*	.779	.13	1.00	.12	.079	.17	<.001	.45*	<.001	.27*	<.001	.34*
Action context															
School	0 - 1	<.001	.54**	<.001	.52**	<.001	.61**	<.001	.46*	<.001	.46*	<.001	.27*	<.001	.31*
	0 - 2	<.001	.82***	<.001	.73**	<.001	.97***	<.001	.64**	<.001	.96***	<.001	.52**	<.001	.68**
	1 - 2	<.001	.28*	.173	.21*	.053	.31*	.033	.19	<.001	.45*	.001	.27*	<.001	.38*
Other	0 - 1	<.001	.40*	.007	.31*	<.001	.49*	<.001	.30*	<.001	.34*	.001	.24*	<.001	.25*
	0 - 2	<.001	.51**	<.001	.63**	<.001	.74**	<.001	.49*	<.001	.77**	.001	.24*	<.001	.47*
	1 - 2	.019	.11	.076	.28*	.598	.20*	.084	.19	.001	.39*	1,00	.01	.037	.23*

Note: *Cohen's *d* low; **Cohen's *d* medium; ***Cohen's *d* high.

Table 5 shows the type of association (A, B, C, or D) between both variables (antisocial behavior and health) for the global health score and for the combination of sex and age, in each type of antisocial behavior according to action outcome and context.

Table 5
Summary of the patterns in perceived global health score

Variable	Global	11-12 years		13-14 years		15-16 years	
		Boys	Girls	Boys	Girls	Boys	Girls
Overall prevalence	B	B	B	B	B	B	B
Action outcome							
Theft	C	B	C	B	B	C	B
Destruction	C	C	C	C	C	C	C
Disobedience	B	C	C	C	B	B	B
Action context							
School	B	C	C	C	B	B	B
Other	C	C	C	C	B	C	B

Note: B= statistically significant differences and a noticeable effect size in the mean scores of the global health score in all different groups; C= statistically significant differences and a noticeable effect size between non-engagement and engaging in behavior of this category, but without significant differences and/or with a noticeable effect size between commit one and commit two or more behaviors.

Results (Table 5) show a lineal or type-B pattern (progressive decrease) for all age groups and both sexes in the association between overall prevalence of antisocial behavior and the adolescents' perceived global health; i.e. the more antisocial behaviors committed the lower the health score. However, analysis by action outcome exhibits differences. Except for destructive behaviors (which always shows a type-C pattern, i.e., a health decrease at low-levels of antisocial behavior), the patterns differ significantly when segregating by sex. Boys show a similar pattern at 11-12 and 13-14 years-old (type-B in theft and type-C in disobeying authority), with the difference appearing in the age jump from 13-14 to 15-16 years-old. However, girls display similar patterns in the higher age groups, specifically 13-14 and 15-16 years-old (type-B in theft and disobedience), in contrast to the pattern found in the 11-12-year-old age group.

As Table 5 displays, the relationship between engaging in antisocial behavior in non-school contexts and perceived health shows no age differences for boys. Rather it is participation versus non-participation that marks the difference in boys. For girls, despite no observable health differences at 11-12 years-old between those who engage in one versus two or more antisocial behaviors, the older age groups show a decrease in their health score according to the number of antisocial behaviors.

However, antisocial behaviors related to school show age differences for both sexes. Specifically, a change is observed from a type-C (decrease in health associated

with low levels of antisocial behavior) to a type-B pattern (progressive decrease), occurring earlier for girls (at 13-14 years-old) than for boys (15-16 years-old).

Discussion

The aim of this research was to determine the prevalence of antisocial behaviors in 11-16-year-old adolescents, as well as analyze the relationship between antisocial behavior and perceived global health. Differences were explored according to sex and age. The results we be discussed according to these objectives.

Attending to the first objective, results show that almost half the adolescents (48.38%) engaged in at least one antisocial behavior during the academic year. This prevalence is lower than reported in other Spanish research, for example Antolín (2011) showed close to a 90% prevalence in certain antisocial behaviors. This leads us to consider the influence on the results of the instrument and the behavior evaluated. Accordingly, Burt et al. (2018) emphasizes the importance of assessing the moderator role of the informants and the sample's contextual and family differences. As Kazdin and Buela-Casal (2006) indicate, classifying a behavior as antisocial depends on the sociocultural context. Therefore, one must consider the context's relativity since each society and each time in history determines what behaviors are understood as reprehensible. Given the diversity in classification and evaluation in this field of research, future studies using different instruments and samples from other cultures would greatly benefit from clear guidelines for developing or adapting measurement instruments, thus facilitating comparison and generalization of the results. Hence, this study has opted to classifying by categories -focusing specifically on low-severity antisocial behaviors- in order to facilitate data comparison with other research despite the use of other instruments or items.

In consonance with Bringas et al. (2006), our study found no sex differences in prevalence of antisocial behavior. There are however differences between the three age groups, showing a higher prevalence with age, both overall and by categories. Moffit (1993) offers a well-known theory on the association between antisocial behavior and age, defending the need to differentiate between two clearly distinct categories: antisocial behavior limited to adolescence, and antisocial behavior persisting throughout life. Based on this proposed taxonomy, many studies have attributed the increased prevalence of antisocial behaviors during this stage to differences in adolescent brain development (Bos et al., 2018; Muetzel et al., 2017).

Likewise, other studies have analyzed differences in brain development to explain changes in prevalence rates according to sex. De Bellis et al. (2001) suggests that there are age related differences between boys and girls in cerebral development. According to these authors, boys may experience a higher decompensation between cortical and subcortical areas of the brain due to the hormonal effects of testosterone (increasing the myelinization process in males) and estrogen (delaying cerebral pruning in females). However, other studies such as Dodge et al. (2006) suggest that testosterone has, at best, a relatively weak

correlation with antisocial behavior in humans. Our study found no differences between Spanish boys and girls in the overall prevalence of antisocial behavior. However, 2018 data from the National Statistics Institute (*Instituto Nacional de Estadística* [INE], 2020) reports almost four times more 14-17-year-old male convicts than females in the same age range. As Moffit et al. (2001) concludes, it may be that boys' antisocial behavior tends to be more severe and more perceptible and is therefore easier for the justice system to identify. Thus, although the term *antisocial behavior* refers to all actions that violate social norms, one must exercise caution when disseminating results given that antisocial behavior can include a wide range of behaviors of differing severity.

Analysis of action outcome categories showed disobeying authority to be the most prevalent antisocial behavior. Sex differences were observed only in destroying objects or places, persisting in the 15-16-year-old age group when combining sex and age. Once again, these results can be attributed to society's censorship of this type of behavior in girls. Certain studies highlight that gender stereotypes amongst the Spanish population peak at 15-16-years-old (De la Osa et al., 2013; Villanueva-Blasco & Grau-Alberola, 2019), coinciding with the age at which differences in the prevalence of destructive behaviors -mostly associated with masculine stereotypes- are found. This underscores the importance of not considering antisocial behavior to be a global concept since results can vary according to the behaviors studied and the categories established (Barker et al., 2007; Van Lier et al., 2009; Vitaro et al., 2006).

If one attends to classification by action context, results show that almost half (41.94%) of the adolescents participated in one antisocial behavior at school compared to other contexts, which fall short of 30%. The fact that adolescents spend many hours of their day at school increases the probability of more behavioral repertoire -including antisocial- occurring there. Furthermore, emotional connections and sense of belonging in family or peer contexts may hinder this type of behavior due to its moral reprehensibility. In today's society school has become the most valuable social context for adolescents given that, according to INE data (2019), it is increasingly more common for both parents to work away from home and have schedules that rarely adjust to the adolescents' school hours, in addition to the adolescent's need for increased independence. As Dmitrieva (2013) argues, the increase in independence and self-determination during adolescence can contribute to expanding the influence of the school, peer, and neighborhood contexts, to the determinant of family contexts. If a high percentage of the antisocial behaviors at this age are committed in the school context -as this study shows-, the socializing effect of school could become distorted, possibly transferring this behavior to other contexts and therefore marking the youths' life-trajectories.

There is widespread belief that antisocial behaviors are normal during adolescence, an idea associated with the classic paradigm portraying it as a period of storm and stress (Hall, 1904). In addition, research indicates that most parents

consider this developmental stage to be conflictive and difficult (Ridao & Moreno, 2008). Accordingly, certain studies emphasize that expectations from the adolescent's environment can have repercussions on their behavior, and consequentially if adolescence is considered to be a time for risk-taking, it is more likely that they will participate in this type of behavior (Buchanan & Hughes, 2009; Qu et al., 2016). Although antisocial behaviors are frequent during adolescence, they should not become normalized for risk of legitimizing them. Furthermore, they have adverse effects on adolescent health. Although few studies offer data on antisocial behavior and adolescent health, research has found association with organic illnesses or internal problems (Kort-Butler, 2017; Marmorstein, 2007; Paradis et al., 2016; Ritakallio et al. 2007; Shepherd et al., 2004; Vermeiren et al., 2002). Therefore, the second research objective was to analyze the relationship between the adolescents' perceived global health and the number of low-severity antisocial behaviors in which they engaged, establishing different patterns according to sex and age. Analysis of the association between health and antisocial behavior resulted in four possible patterns: A) no association between health and antisocial behavior; B) a progressive decrease in perceived health as the number of antisocial behaviors increases; C) a decrease in perceived health when engaging in some antisocial behavior, regardless of the number of behaviors; and D) no health differences when engaging in zero or only one antisocial behavior, however a decrease in health when engaging in two or more antisocial behaviors. Analysis of the relationship between antisocial behavior and health showed exclusively type-B and type-C patterns. Type-A and type-D patterns were not observed in this study, emphasizing that participation in at least one antisocial behavior has an effect on the adolescent's health. Our data shows that engaging in only one low-severity antisocial behavior is associated with a worse health score for both sexes of all ages. Other studies offer similar results using global indicators of health or psychosocial adjustment. For example, Vermeiren et al. (2002) found association between antisocial behavior and depression, somatization, negative expectations regarding the future, and sensation seeking.

These analyses once again emphasize the importance of considering the adolescents' sex and age. It was specifically found that younger adolescents tend towards a type-C pattern (i.e., engaging in one antisocial behavior is significantly related with worse perceived global health, however no differences between engaging in one or more behaviors), and older adolescents tend to show a type-B pattern (a progressive decrease in health as they become involved in more antisocial behaviors). This may possibly be due to the coding of the variables. Our research differentiated between non-engagement, engagement in one behavior, and engagement in two or more behaviors, however it has not differentiated between those adolescents who engaged only once and those that have frequently engaged in each type of behavior. It is therefore possible that older adolescents are involved in each type of behavior more frequently than younger adolescents, which could

affect their global health score; an interesting hypothesis to explore in future research.

At any rate, this developmental difference in the association between antisocial behavior and perceived global health occurs at different ages according to sex. Whereas girls usually experience the change between 11-12 and 13-14 years-old, it happens for boys between 13-14 and 15-16 years-old. These results can be attributed to differences in cognitive development during puberty, for example sex differences in perspective taking (Van der Graaff et al., 2014), or the tendency to spontaneous adopt the point of view of others (Davis, 1983), a concept very related to antisocial behavior. Results from Van der Graaff et al. (2014) show that, while girls display a progressive increase with age in the tendency to spontaneously adopt the point of view of others, this increase tends to happen in boys from 15 onwards. The act of taking into consideration what others think about their behavior may explain the similar patterns in girls at 13-14 and 15-16 years-old, and why this changes in boys starting at 15-16 years-old.

The type-C pattern found in the destruction category is noteworthy, as it remains constant independently from sex and age. This finding may be because the frequency -rather than the number of behaviors- is important in this category. Regardless, these results highlight the idiosyncrasies of destructive behaviors, an important consideration for future research as well as interventions for adolescents who display this antisocial profile.

This study is not without limitations, such as not considering the intentionality of the antisocial behaviors in the classification. In addition, this study utilizes a transversal rather than longitudinal research design, and results are therefore limited when trying to establish casual relationships.

Despite these limitations, this research provides insight into the prevalence of antisocial behavior in a representative sample of 11-16-year-old Spanish adolescents. In addition, the results of this study can help clarify the reasoning behind contradictory results in other research. Likewise, these results can offer relevant information for practical intervention and justify preventing these types of behaviors, despite their low severity. As Romer (2010) points out, interventions that teach coping skills for facing the characteristic risks of this stage can compensate for structural deficits in the brain during adolescence.

As previously emphasized, our results show a negative association between engaging in antisocial behaviors and perceived global health. In addition, these results differ according to sex and age-group, showing the largest difference between boys and girls in the 13-14-year-old group. Therefore, interventions aimed at preventing antisocial behavior should be adjusted to the adolescents' sex and age. Non-compliance of social norms can carry administrative and legal consequences starting at 15-years-old, and therefore, observing the patterns of the 13-14-year-old boys (more similar to 11-12-year-old boys and girls) and 13-14-year-old girls (similar to 15-16-year-old boys and girls) may suggest reconsidering whether or not boys

and girls are equally prepared to face the legal consequences of their actions at this age.

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Received: July 13, 2021
Accepted: April 2, 2022