

## ORIGINAL ARTICLE

# Can parenting practices predict externalizing behavior problems among children with hearing impairment?

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**Objective:** To identify possible differences in the level of externalizing behavior problems among children with and without hearing impairment and determine whether any relationship exists between this type of problem and parenting practices.

**Methods:** The Behavior Assessment System for Children was used to evaluate externalizing variables in a sample of 118 boys and girls divided into two matched groups: 59 with hearing disorders and 59 normal-hearing controls.

**Results:** Significant between-group differences were found in hyperactivity, behavioral problems, and externalizing problems, but not in aggression. Significant differences were also found in various aspects of parenting styles. A model for predicting externalizing behavior problems was constructed, achieving a predicted explained variance of 50%.

**Conclusion:** Significant differences do exist between adaptation levels in children with and without hearing impairment. Parenting style also plays an important role.

**Keywords:** Child psychiatry; families; child rearing; hearing loss; disruptive, impulse control, and conduct disorders

## Introduction

The DSM-5<sup>1</sup> defines conduct disorder as “a repetitive, persistent pattern of behavior disrespectful towards the basic rights of others and the social rules and conventions appropriate to the person’s age, and characterized by: 1) aggression towards people and animals, 2) destruction of property, 3) deceit or theft, 4) serious infringement of the rules.” Attention deficit/hyperactivity disorder is defined as “a persistent pattern of inattention and/or hyperactivity-impulsiveness that interferes with personal functioning or development and is characterized by 1) inattention, 2) hyperactivity and impulsiveness.” The Behavior Assessment System for Children (BASC),<sup>2</sup> one of the most comprehensive evaluation tools available, measures numerous aspects of adaptive and non-adaptive behavior. It defines externalizing problems as disruptive forms of conduct such as aggression, hyperactivity, and other forms of dishonest behavior, like transgressing social norms and delinquency.

Some authors have compared the prevalence of behavioral problems in children with hearing impairment with that found in children with normal hearing, but, to date, the information available in this regard has been scarce. Some studies have shown that people with hearing impairment are more likely to develop behavioral problems, with significantly higher levels of aggression, psychopathic symptoms, attention deficit/hyperactivity, oppositional defiant

disorder, and behavioral disorders.<sup>3</sup> Barker et al.<sup>4</sup> also reported that children with hearing impairment manifested worse behavioral problems than children with normal hearing on the attention, internalization, and opposition scales of the Child Behavior Checklist (CBCL), but differences were not significant on the aggressive conduct scale. In the same vein, a study carried out by Fellingner et al.<sup>5</sup> compared the mental health of children with and without hearing impairment. The parents of deaf children reported a higher prevalence of behavioral problems, problems with classmates, and prosocial behavior. Teachers’ reports likewise indicated that children with hearing impairment exhibited more behavioral problems, attention and hyperactivity problems, and problems with classmates. In the same line of research, a study carried out by Díaz et al.<sup>6</sup> to explore prevalence rates of psychiatric disorders in adult deaf people analyzed the profiles of patients receiving psychiatric treatment. Differences were found between adults with hearing impairment and adults with normal hearing in several categories: bipolar disorders (3.7 vs. 14.2%), impulse control disorders (15.8 vs. 5.2%), anxiety disorders (18.7 vs. 30.1%), attention deficit/hyperactivity disorder (11.2 vs. 4.9%), pervasive developmental disorders (3.3 vs. 0.3%), substance use disorders (27.8 vs. 48.4%), and intellectual disability (10.4 vs. 2.9%).

Considering these results, the quality of a child’s upbringing is clearly fundamental for their future development. The evidence obtained emphasizes the importance of the parents’ role in the emergence of problems affecting children and adolescents. One area currently being studied is the importance of parenting style as a predictor of behavior and development patterns among children and adolescents.<sup>7-15</sup> Several studies have taken

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Submitted Dec 05 2016, accepted May 08 2017.

into account parenting style as a moderator of aggressive conduct in children and adolescents,<sup>7,16-18</sup> relational aggression,<sup>19</sup> alcohol and tobacco consumption, antisocial behavior,<sup>10,11</sup> hyperactivity and impulsiveness,<sup>20,21</sup> and high-risk sexual behavior.<sup>22</sup> Longitudinally, aggressive delinquency in middle childhood and adolescence is directly related to low levels of parental control in early childhood, maternal sensitivity, and parental rejection.<sup>23-25</sup> It can therefore be affirmed that parenting styles are indeed linked to high-risk behavior by children and adolescents. If, furthermore, the children in question have some form of disability, then the consequences for family happiness may be very negative.<sup>26</sup> Although numerous studies have attempted to shed light on the variables involved in the parent-child relationship, not many researchers have considered the relevance of disability as a modulating factor.<sup>26</sup> The arrival of a disabled child in a family unit may increase needs and complications in the household, leading to differences in behavior between parents of children with and without disabilities in areas such as the amount of attention given to the child, their perception of parenting,<sup>27,28</sup> satisfaction, role distribution, the degree of discipline exercised, communication, support,<sup>29</sup> affection, participation in and frequency of family activities,<sup>30,31</sup> and overprotection.<sup>32</sup> This would seem to confirm the existence of differences in the ways in which parents of children with and without disabilities raise their offspring.<sup>29</sup>

Although the prevalence of certain disorders is clearly higher among boys and girls with hearing impairment, to date, very few studies have presented specific data on how parenting styles influence the problems experienced by young people with disabilities. This study aims to throw some light on the issue by focusing on the parenting practices adopted by mothers and fathers of children with hearing impairment, and how those practices may affect externalizing behavior problems. The objective is twofold: 1) to identify differences in the level of externalizing behavior problems among children with and without hearing impairment and in the parenting styles experienced by both groups; and 2) to ascertain whether any relationship exists between parenting practices and the level of externalizing problems among children with hearing impairment, so as to generate a model capable of predicting externalizing problems based on specified attitudes and parenting practices adopted by mothers and fathers.

## Methods

### *Participants*

A total of 59 boys and girls with hearing impairment, diagnosed by the medical component of the Spanish social services system, were chosen at random from schools in the Spanish regions of Andalusia, Madrid, and Catalonia by their respective school principals. Of the 59 selected children, 47 had moderate hearing impairment (41-70 dB) and 12 had severe impairment (71-90 dB). Children with mental disabilities were not eligible for the study. Another group of 59 boys and girls, similar to the first group but with no disabilities of any kind, was also

selected. To guarantee the homogeneity of the groups, for each subject with a hearing impairment selected, a classmate of the same sex, age, and academic level, but with no disability, was selected randomly from a list of all eligible classmates.

Each group therefore comprised 59 children (a total of 118): 29 girls and 30 boys. The mean (standard deviation) age was 10.54 (3.03) years in the hearing impairment group and 10.17 (2.87) years in the no-disability (control) group. In both groups, the children's ages ranged from 6 to 16. Parental socioeconomic status, as indicated in the corresponding school records, was lower middle for 6%, middle for 32%, and upper middle for 68% of the sample.

All subjects were treated according to the ethical rules of the American Psychological Association and gave their informed consent. The research ethics committee at Universidad de Córdoba approved the research procedure and certified that the project respected the main principles established by the Helsinki Declaration of 1975, as revised in 2000 and 2008, and later amended in the 1996 European Council Convention on Human Rights and Biomedicine. Specific national legislation was also observed.

### *Instruments*

Three instruments were used to gather information: a Spanish-language adaptation of the BASC,<sup>2</sup> which evaluates a wide spectrum of pathological and adaptive dimensions using different sources of information (parents, teachers, and children) and methods (questionnaires, developmental history, and student observation); the Cuestionario de Crianza Parental (PCRI-M) by Roa & del Barrio,<sup>33</sup> an adapted version of the Parent-Child Relationship Inventory<sup>34</sup>; and the Parental Bonding Instrument (PBI), a questionnaire based on John Bowlby's Attachment Theory, developed by Parker et al.<sup>35</sup> These instruments are described in further detail below.

First, the Teacher Rating Scale questionnaire of the Spanish version of the BASC was used. The questionnaires were divided into three levels corresponding to different age groups (3-6, 6-12, 12-18), with internal consistency levels of 0.70 to 0.90 in the different scales. Test-retest correlation values were 0.85, 0.88, and 0.70 for the three levels in the teachers' questionnaire.

Of the different scales available in this instrument, this study employed the composite dimension denominated externalizing problems, which in turn derives from three other scales related to disruptive behavior: aggression, hyperactivity, and behavioral problems. This scale has Cronbach's  $\alpha$  internal consistency values of 0.86 to 0.88. The scores obtained on any of the scales are converted into *t* scores of 0 to 100, to allow comparisons between subjects of different ages. These scores are used to establish different levels: scores below 30 are considered very low; below 40, low; between 40 and 60, average; above 60, a risk factor; and above 70, clinically significant.

The PCRI-M uses direct scoring to measure specific aspects of parents' interaction with their children. The questionnaire comprises 78 items with four answer options (ranging from total disagreement to total agreement),

grouped to form seven scales. High scores in the different scales indicate a high degree of identification with the situation described in each case. The seven scales are: parental support – the level of emotional and social support a parent receives; satisfaction with parenting – the amount of pleasure and fulfillment an individual derives from being a parent; involvement – the level of a parent's interaction with and knowledge of his or her child; communication – a parent's perception of how effectively he or she communicates with a child; limit setting – a parent's experience disciplining a child; autonomy – the ability of a parent to promote a child's independence; and role orientation – parents' attitudes about gender roles in parenting. The instrument's internal consistency for this sample, obtained by Cronbach's  $\alpha$  coefficient, ranged from 0.68 on the Support scale to 0.78 on the Satisfaction with parenting scale.

The PBI consists of 25 items divided into two scales: care (12 items) and overprotection or control (13 items). Each item is scored on a Likert-type scale of 0 to 3, the options being: always (S), almost always (C), sometimes (A), and never (N). The care scale has a maximum score of 36 points, and the overprotection scale, a maximum score of 39 points. For this sample, Cronbach's  $\alpha$  reliability coefficients were 0.78 for the Care scale and 0.62 for the Overprotection scale.

### Procedure

Once a suitable sample group had been identified in different schools in the regions of Andalusia, Madrid, and Catalonia, the management and the school board of each school were contacted and asked to authorize the use of the study's instruments to collect information. The questionnaires were filled out on an entirely voluntary basis.

The school counselor – or, when necessary, the principal – provided details of the study to the parents and teachers of classes in which children with hearing impairment were enrolled. To avoid common rater bias effects when the relationship between child behavior and parenting style is examined by the same person, the children's behavior was rated by the teachers and the parenting styles by the parents. The instruments were distributed in two parts: mothers and fathers received copies of both the PCRI and the PBI, so that they could answer the questionnaires separately, while the teachers completed the teachers' version of the BASC applicable to their particular level, taking into account the age of the child. The same teacher had to complete both the questionnaire for the subject with hearing impairment and the questionnaire for the matched classmate with no disability.

Once the required information had been obtained, the data were tabulated and analyzed in SPSS.

### Design and data analysis

The study used a cross-sectional retrospective design. After description of the results obtained for each of the variables of interest, ANOVA was performed to identify the main differences between the groups of children with

and without hearing impairment, with regard both to externalizing problems and to their mothers' and fathers' parenting practices. To determine the principal parenting practices linked to externalizing problems in children with hearing impairment, linear regression analysis was used, with externalizing problems as the dependent variable and the different PCRI and PBI scales (for both fathers and mothers) as independent variables or factors. A model was then selected which offered a good proportion of predicted variance but which was also as simple and prudent as possible.

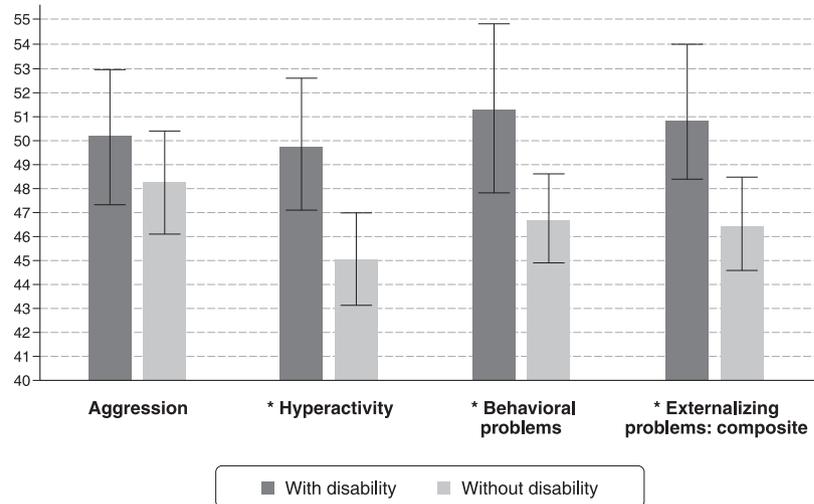
### Results

The first objective of this study was to identify the main differences in the level of externalizing behavior problems among children with and without hearing impairment and to describe the main differences in parenting practice perceived by disabled and non-disabled children.

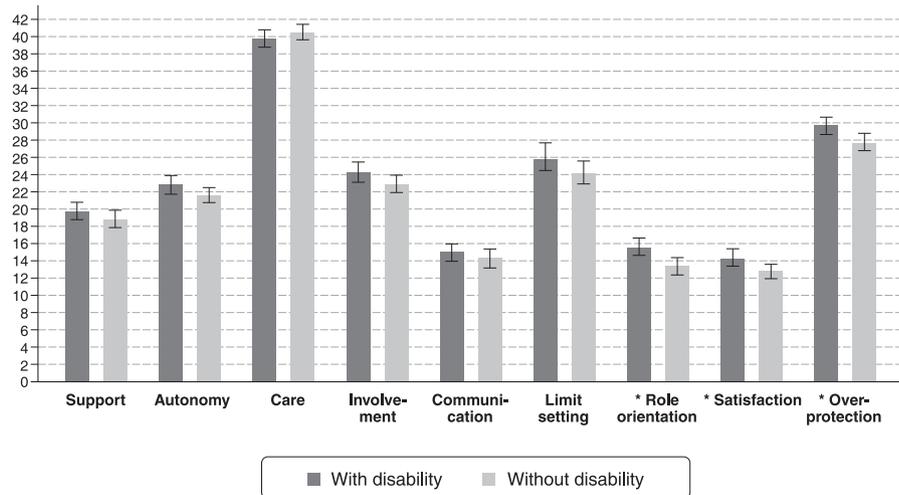
To this end, the different externalizing-type variables (aggression, hyperactivity, behavioral problems, and the composite dimension externalizing problems) were first compared in children with and without hearing impairment. These variables were measured using the teachers' version of the BASC. The scores for each group are shown in Figure 1. Differences were found in all cases, and were statistically significant in hyperactivity ( $F_{1,117} = 7.738$ ;  $p = 0.006$ ;  $\eta_p^2 = 0.063$ ; 95% confidence interval [95%CI] = 1.347 to 8.043), behavioral problems ( $F_{1,117} = 5.259$ ;  $p = 0.024$ ;  $\eta_p^2 = 0.044$ ; 95%CI = 0.628 to 8.502), and externalizing problems ( $F_{1,117} = 5.615$ ;  $p = 0.019$ ;  $\eta_p^2 = 0.047$ ; 95%CI = 0.723 to 8.009), although effect sizes were small. With respect to aggression, the differences, although similar, were not statistically significant ( $F_{1,117} = 1.129$ ;  $p = 0.290$ ;  $\eta_p^2 = 0.010$ ; 95%CI = -1.626 to 5.388).

Variables pertaining to the parenting style scale were also measured: support, satisfaction with parenting, involvement, communication, limit setting, autonomy, role orientation, care, and overprotection. Figure 2 shows the scores obtained in these variables for the mothers of children with and without hearing impairment, and Figure 3 shows the scores obtained by the fathers in the same scales. In the ANOVA carried out to identify possible differences in parenting style scores recorded for mothers and fathers, the only significant differences were found among mothers (Figure 2), in the variables maternal role orientation ( $F_{1,117} = 11.768$ ;  $p = 0.001$ ;  $\eta_p^2 = 0.094$ ; 95%CI = 0.943 to 3.521), maternal satisfaction with parenting ( $F_{1,117} = 4.811$ ;  $p = 0.030$ ;  $\eta_p^2 = 0.042$ ; 95%CI = 0.131 to 2.588), and maternal overprotection ( $F_{1,117} = 6.256$ ;  $p = 0.014$ ;  $\eta_p^2 = 0.052$ ; 95%CI = 0.420 to 3.626).

The second objective of the study was to generate a predictive model for externalizing problems based on specified attitudes and parenting practices adopted by mothers and fathers, which would be capable of shedding light on the relationship between certain aspects of parenting practice and externalizing problems among boys and girls with hearing impairment. For this purpose, a linear regression analysis was used to create a model which incorporated some of the parenting style factors and was able to predict the likelihood of high scores for



**Figure 1** Externalizing problems scores in children with and without hearing impairment, including error bars. \* Significant differences.



**Figure 2** Scores obtained for the mothers of children with and without hearing impairment in variables related to parenting style (PCRI-M and PBI). \* Significant differences.

externalizing behavior problems. As shown in Table 1, the eight variables with the greatest predictive capacity in the model were paternal overprotection and maternal autonomy, role orientation, support, limit setting, satisfaction with parenting, communication, and involvement.

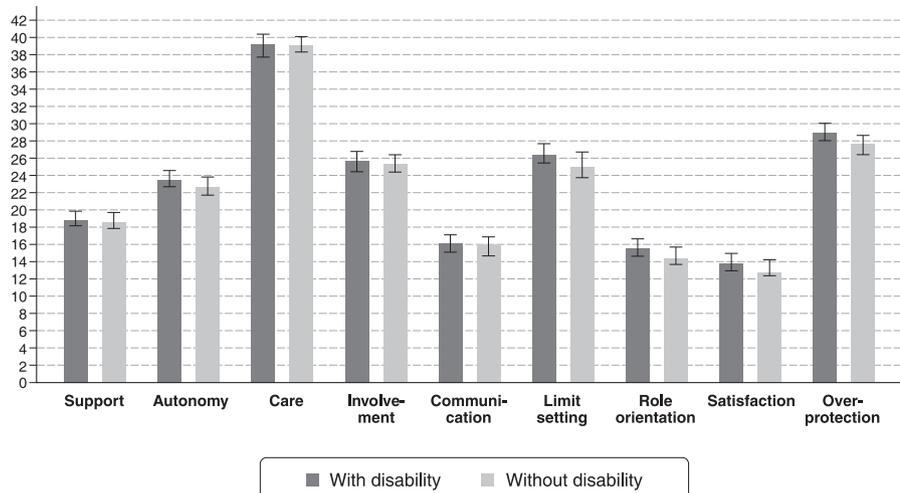
The eight-variable model includes those variables which contributed most significantly to its predictive capacity. An  $R^2$  value of 0.500 was obtained; thus, we can state that this model achieved a predicted explained variance of 50% for externalizing behavior problems. Although two of the variables in the model were not significant (paternal overprotection and maternal involvement), it was deemed useful to include them both for their theoretical relevance and because their presence produces a 10% increase in the model's predictive capacity, with  $R^2$  rising from 0.401 to 0.500. Negative beta coefficients were obtained for three of the variables (maternal involvement, role orientation, and limit settings). These variables therefore predict a high

score in externalizing behavior when low scores are obtained. For the other variables, the opposite is true: they act as risk factors when scores are high.

The regression model obtained was then applied to the group of children without hearing impairment, yielding an  $R^2$  of 0.431. Only the paternal overprotection and maternal satisfaction with parenting variables were significant in this case, indicating that this model was less suited to the group of children without disabilities.

## Discussion

The objective of this study was to identify possible differences in the level of externalizing behavior problems among children with and without hearing impairment and in the ways both groups of children are raised. Considering the differences found, we conclude that teachers' evaluations of behavioral problems in children with hearing



**Figure 3** Scores obtained for the fathers of children with and without hearing impairment in variables related to parenting style (PCRI-M and PBI). No significant differences observed.

**Table 1** Multiple regression model for the Externalizing behavior problems variable in children with hearing impairment

Variable	R	R <sup>2</sup>	F	p	B	t	p-value	Interval B 95%	
								Lower	Upper
Model 8	0.707	0.500	3.630	0.005					
Constant					5.991	0.332	0.742	-30.916	42.899
Father's overprotection					0.717	1.260	0.218	-0.446	1.880
Mother's autonomy					1.883	3.294	0.003	0.714	3.052
Mother's role orientation					-1.316	-2.439	0.021	-2.419	-0.212
Mother's support					1.626	2.760	0.010	0.421	2.831
Mother's limit setting					-1.506	-2.152	0.040	-2.938	-0.075
Mother's satisfaction with parenting					1.470	2.339	0.026	0.185	2.756
Mother's communication					1.377	2.226	0.034	0.112	2.643
Mother's involvement					-1.288	-1.904	0.067	-2.671	0.096

impairment differ from their evaluations of such problems in children with no hearing impairment. The existence of differences in the way externalizing behavior problems are manifested, as mentioned earlier in the introduction, is confirmed by the findings of this study.<sup>3,5</sup> Although our results regarding aggression cannot be considered conclusive, they nevertheless coincide to some extent with Barker et al.<sup>4</sup> in not having been able to demonstrate major differences in aggressive behavior. It would appear that a certain parallelism can be established insofar that problems such as disobedience to rules, antisocial behavior, and hyperactivity appear more frequently than aggression in children with hearing impairment than in their hearing counterparts.

This study did not find substantial differences in the parenting styles used by the fathers and mothers of children with vs. without hearing impairment. In fact, the few differences identified were largely to do with positive aspects. The mothers of children with hearing impairment reported being more satisfied with parenting and regarded parenting as a job to be shared with their partners, although they also showed themselves to be more overprotective. Many of these results contradict those presented by Eshbaugh et al. and Nakajima et al.,<sup>30,31</sup> who emphasized the negative consequences associated

with parenting disabled children. However, this may be due to cultural differences.

The few differences observed between the two groups in paternal and maternal parenting styles (three out of 18 possible dimensions) contrast with the differences obtained in externalizing problems (three out of four measurements). This may be due to greater sensitivity by teachers to differences between children with and without disabilities. However, differences not seen in the bivariate analyses appear more clearly in multivariate (regression) analysis, which would support the idea that effects on children depend not on specific variables but on specific family profiles that can be identified by means of multivariate analysis. The family profile capable of predicting externalizing behavior among children with hearing impairment would thus be different from the family profile capable of doing so for children without such disabilities. A combination of high scores in paternal overprotection, maternal autonomy, maternal support, maternal satisfaction with parenting, and maternal communication, along with low scores in maternal limit setting, maternal involvement, and maternal role orientation, significantly contributes to a higher likelihood of high BASC Externalizing behavior problems scores among children with hearing impairment.

The main innovative contribution of this study is therefore its creation of a predictive model for externalizing problems based on attitudes and parenting practices adopted by mothers and fathers. A model of this type is a useful aid in drawing up educational guidelines for parents and educators of children with hearing impairment. The results obtained show a link between certain features of the parenting style experienced and externalizing behavior problems. These variables produce an explained variance of 50% for externalizing behavior problems. Given the multidimensional nature of such problems, the emergence and persistence of which can be affected by such diverse factors as family, peers, and the media, this is a very significant percentage.

It is important to emphasize the crucial role played by mothers in the make-up of the model: seven of its eight component variables referred to maternal parenting style. The different aspects of parenting style included in the model affect the evolution of externalizing behavior problems in conflicting ways, with some acting as risk factors and others as protective factors. However, although the different variables may seem to exert contradictory influences, we should guard against interpreting the results in too biased a manner. Any proposed risk profile associated with externalizing problems in children with hearing impairment would necessarily point towards highly communicative mothers who are satisfied with their parenting role, feel supported, and are happy to help their children become independent, but who are not very good at setting limits (low discipline), have little involvement with key aspects of parenting, and do not pursue a more equal distribution of parenting duties (traditional family). The same profile would include overprotective fathers. The “low discipline – high autonomy” binomial may be identified with a negligent parenting style, as described in earlier studies such as that of Raya et al.<sup>17</sup>

Together with the contradictory role played by autonomy when interacting with variables such as limit setting, it is also interesting to point out the influence of role orientation. Our results show that, in the model obtained, a family with a more traditional role orientation – i.e., in which childrearing is primarily the mother’s responsibility – might be considered a risk factor for externalizing problems. This would suggest a family profile in which the father is overprotective in his limited interactions with the children and in which a negligent mother performs most parenting tasks.

The information obtained must be analyzed assuming the existence of a two-way relationship between parents and their children, in which the behavior and attitudes of both parties exert mutual influence. Considering this interaction between parents and children, our findings could be useful for counseling the families of children with hearing impairment. They offer guidance on certain specific aspects of day-to-day parenting that are susceptible to change, e.g., by teaching parents to establish and enforce clearly defined rules or to share parenting tasks more equally.

The limitations of this study are those inherent to the use of questionnaires as assessment instruments, instead of observational and clinical measures. To minimize these biases, parental behavior was evaluated by parents, while

children’s behavior was assessed by teachers, because the school context is more homogeneous than the home context which may vary considerably among children. Furthermore, the instrument used to assess externalizing behavior (BASC) is well-validated, with clinical cutoff points. Nevertheless, the concurrent use of a clinical assessment would add value. The preventive and interventive guidelines provided by this study could be enhanced through replication studies using broader, more diverse samples, or through new research projects aimed at exploring certain family variables associated with positive aspects of development (such as adaptive skills) or negative aspects (such as internalizing behavior problems).

## Acknowledgements

This study was supported by the Spanish Ministry of Science and Innovation (grant EDU2009-12619).

## Disclosure

The authors report no conflicts of interest.

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