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IMPACT OF HEARING DISABILITY ON THE PSYCHOEMOTIONAL DEVELOPMENT OF PERSONS WITH PROFOUND DEAFNESS ACCORDING TO FAMILY OF ORIGIN

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¶ **Abstract**. The lack of studies comparing the educational and social adaptation of congenitally deaf population, according to whether their parents are deaf or hearing, is the motivation for the present study. The aim was to determine the effects on the psychosocial development and anxiety level of profoundly deaf persons depending on whether their parents were deaf or hearing. The study sample comprised 12 deaf individuals aged between 24 and 67 years (M=38.92; SD=13.957; 66.7% women). We used the State-Trait Anxiety Inventory (STAI), adapted for deaf population by means of video in which a specialist in Spanish sign language presented each item, ensuring they were all understood. The results show significant differences in level of anxiety between the two sub-samples. It is essential to ensure deaf participants' comprehension of the items, due to the difficulty the test involves for this group of individuals, given that is in what for them is a second language. If participants were born in a family with hearing parents or deaf parents it would help determine preventive elements and the actions to be implemented for all deaf children to be diagnosed as early as possible.

Keywords: anxiety, deaf, normally hearing, sign language

IMPACTO DE LA DISCAPACIDAD AUDITIVA EN EL DESARROLLO PSICOEMOCIONAL DE PERSONAS CON SORDERA PROFUNDA SEGÚN FAMILIA DE ORIGEN

Resumen. La falta de estudios que comparen la adaptación educativa y social de la población con sordera congénita, según sean sus padres sordos u oyentes, es la motivación del presente estudio. El objetivo era determinar los efectos sobre el desarrollo psicosocial y el nivel de ansiedad de las personas con sordera profunda en función de si sus padres eran sordos u oían. La muestra de estudio estuvo compuesta por 12 personas sordas con edades comprendidas entre 24 y 67 años (M = 38,92; DE = 13,957; 66,7% mujeres).

Se utilizó el Inventario de Ansiedad Rasgo-Estado (STAI), adaptado a la población sorda mediante un video en el que un especialista en lengua de signos española presentaba cada ítem, asegurándose de que se entendieran todos. Los resultados muestran diferencias significativas en el nivel de ansiedad entre las dos submuestras. Es fundamental asegurar la comprensión de los ítems por parte de los participantes sordos, debido a la dificultad que supone la prueba para este grupo de individuos, ya que es en lo que para ellos es una segunda lengua. Si los participantes nacieran en una familia con padres oyentes o padres sordos ayudaría a determinar los elementos preventivos y las acciones a implementar para que todos los niños/as sordos sean diagnosticados lo antes posible.

Palabras clave: ansiedad, sordera, normo oyentes, lengua de signos

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Introduction

Most research in the deaf population has focused on language and intellectual development, while scant attention has been paid to the importance of emotional development in this developmental process. Additionally, few studies have been conducted in sign language.

Emotional intelligence has been described as a complex construct, composed of emotional, personal and social skills. The model of conscious emotional bonding intelligence (Vinculación Emocional Consciente, Autor, 2009, 2014, 2015, 2019) refers to "the ability to consciously bond with the emotion we feel at each moment", such that the nucleus of emotional intelligence lies in feeling and not in thinking about what we feel.

Anxiety is the consequence of rigidity or chronicity in the activation of the emotions of anger, disgust and fear. Thus, what we describe as anxiety can be measured by the acceleration of our nervous system (glutamate activation) as a rigid response to these three emotions (Autor, 2009).

The impacts of deafness on cognitive development are essentially related to linguistic and communicative isolation. A deaf person's language and communicative abilities logically affect their relationship with the peers (Hintermair et al., 2017; Marschark & Spencer, 2010). It has been shown, for example, that deaf children's communicative abilities are positively related to the frequency of social interaction and the frequency of participation in associative and collaborative games (Hintermair et al., 2017; Wolters et al., 2012). Additionally, during interactions, deaf and hard of hearing persons, especially in the early years of life, tend to use a greater proportion of literal or current-action utterances about and speak less about abstract or symbolic concepts (Brown et al., 1997). In fact, any language impairment resulting from serious deafness limits the capacity for interaction, while the acquisition of any language (including sign language) permits the normal exchange of messages and concepts, limiting the negative consequences of hearing difficulties (Courtin, 2000; Bowman-Smart et al., 2019).

The effects of deafness on linguistic and cognitive development can vary greatly depending on the way in which family, society and culture react to, and interact with, a hearing impaired person (Bowman-Smart et al., 2019). Arguably, the impact of an individual's hearing impairment on their quality of life can be moderate or can be magnified by their social and family environment. The lack of communication and auditory stimulation, for example, can seriously compromise the psychological and social adaptation of children with hearing problems (Bowman-Smart et al., 2019).

The family plays a key role in the language acquisition process. Children with hearing parents normally exhibit a substantial delay in language development, which varies greatly according to the individual due to the influence of multiple factors that include, among others, early diagnosis, level of hearing loss, the time and type of intervention and individual characteristics (Hussain et al., 2021; Malaia et al., 2020). In contrast, when the deaf child's parents are also non-hearing, the impairment of language skills is not so evident (De Santis, 2011). From a more general perspective, the attitudes of the parents and their participation in their child's educational process and the social support received are aspects related to the social and academic development of deaf persons, especially in the early years of life (Calderón & Greenberg, 2000; Hussain et al., 2021).

The main cause of this disparity is likely the difficulty hearing parents have in communicating with their deaf child and transmitting them concepts and knowledge. Even if one of the parents commits to learning sign language, they are unlikely to become sufficiently proficient in a short enough time to satisfy the communicative needs of their child in the early years of their life.

According to Porter et al. (2021) hearing parents find the diagnosis of deafness much more traumatic. Indeed, when the child is very small and before diagnosis, they interact with their child naturally and spontaneously and their communication strategies are multimodal. When the suspicion of deafness emerges, something is lost and the situation often deteriorates once the diagnosis is established (De Santis, 2011; Meadow-Orlans, 2001; Porter at al., 2021).

Deaf populations are generally highly heterogeneous in their cognitive, social and emotional development (Fellinger et a.l, 2012). A number of studies have evidenced that children with hearing impairments often present difficulties in their social-emotional development (Dammeyer, 2010; Hogan et al., 2011; Overgaard et al., 2021; Pourmohamadreza-Tajrishi et al., 2013; Sidera et al., 2020). Furthermore, it has been extensively shown that social-emotional development is a predictor of mental health, substance use, aggression, and academic and professional attainment (Kushalnagar et al., 2019; Wong, et al., 2020).

Two factors appear to have a direct impact on this development in deafness: language skills and social interactions. On the one hand, limitations in language development and difficulties in communication determine the presence of social-emotional problems (Overgaard et al., 2021; Sidera Morgan & Serrat, 2020) and make deaf individuals susceptible to facing social and psychological disorders (Kushalnagar et al., 2019; Pourmohamadreza-Tajrishi et al., 2013; Wong et al., 2020). On the other, difficulties in communication constrain the possibility of socialisation and compromise the quality and quantity of social interactions (Marschark & Spencer, 2010), and given that social-emotional development depends on the capacity to interact and the ability to show empathy (Rivers et al., 2013; Sidera et al., 2020; Tsou et al., 2021), problems of socialisation hinder the development of these skills.

Thus, it is important to study effects on profoundly deaf individuals' psychosocial development and their level of anxiety depending on whether their parents are hearing or non-hearing. Accordingly, we propose three hypotheses: 1) The level of anxiety in congenitally deaf individuals is different depending on whether the parents are deaf or hearing; 2) The level of trait anxiety is higher in congenitally deaf individuals of hearing parents compared to those of deaf parents; and 3) The level of state anxiety is higher in congenitally deaf individuals of parents that are hearing compared to those of deaf parents.

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Method

Participants

This was a cross-sectional, correlation study using convenience sampling. The sample comprised 12 signing deaf persons aged from 24 to 67 years (M=38.92; SD=13.957; 66.7% women). The overall sample wad divided into two sub-samples according to the parents' hearing capacity, with one group whose parents were hearing (aged 25-54 years; M=40.33 and SD=13.837; 66.7% women) and one in which the parents were deaf (aged 24-67 years; M=37.5 and SD=15.241; 66.7% women).

All the participants were of legal age and voluntarily took part in the research.

All the participants were informed of the aims of the study, their right to drop out, the use that would be made of their data, the personal data protection law (Organic Law 2/2018, of 5 December, on Data Protection and Guarantee *of* Digital Rights), and they all signed documents stating they had been informed of and understood all the details of the research.

Instruments

To measure anxiety, we used the State-Trait Anxiety Inventory (STAI) (Spielberg et al., 1970; Spanish adaptation by Buela-Casal et al., 2015). It comprises 40 items, 20 measuring state anxiety and 20 measuring trait anxiety. Participants rate their level of anxiety on a 4-point Likert scale from 0 (never/almost never) to 3 (always/almost always) in response to situations described in each item. The confidence intervals in this study were adequate (.946 and .938 for state and trait anxiety, respectively).

Given deaf people's frequent difficulties in reading and writing, we produced a tutorial video in which all the items on the STAI were transcribed into sign language. Participants could thus see the questions on the computer screen and had access to a corresponding recording of each item in sign language.

This ensured the items were understood by the signing participants and that they all comprehended the emphasis on the emotional content transcribed to sign language. This aspect was given great consideration, being a special element of the study.

Procedure

The sample was recruited through the Euskal Gorrak association, which assists deaf people in the Autonomous Community of Euskadi (the Basque Country). The participants were all members of the association and thus we used a convenience sample.

As regards the number of participants, there are no more than 12 members of Euskal Gorrak association with deaf parents, and thus 50% of the overall population in this study were deaf individuals with deaf parents. We then obtained a comparable sample of deaf persons of similar characteristics but with hearing parents. Given the extremely small number of deaf persons with deaf parents, we invited the whole population to participate, of whom 50% voluntarily accepted. The Euskal Gorrak association selected a sample of deaf persons with hearing parents that was equivalent in age and gender to the sample of deaf participants with deaf parents.

The participants were invited in groups of six to a meeting with the principal investigator in a specially prepared room with individual computers to explain the aims of the research.

Additionally, the Euskal Gorrak association provided sign language specialists to ensure participants understood the procedure and instructions and could use the computer and understand the task. The study was reviewed and studied by the Conduct Committee of the Euskal Gorrak association, to check the appropriateness of the study and to guarantee the study design was followed at all times and across all phases.

The time taken to administer the test was 10-25 minutes, depending on the time needed by each participant to understand the questions and respond.

Statistical analyses

First, to determine whether the groups were equivalent, we compared the ages and gender of the participants in each group, using the Mann-Whitney U Test and the Chi-squared test, respectively. We then compared the levels of anxiety between the two groups to test the study hypotheses. To do so, we evaluated the assumptions of normality and homogeneity of the variances of each group, and subsequently compared the levels of state and trait anxiety, using the Mann-Whitney U Test.

For each comparison, we calculated the effect sizes for non-parametric tests using Hedges' g, and followed the recommendations of Cohen (2013) for their interpretation. The sample was selected using convenience sampling, comparing age and sex. To test the hypotheses, we used normality and homogeneity tests in the two sub-samples. The analyses were conducted using SPSS Version 26.

¶Results

First, Table 1 shows the descriptive statistics for the participants in the study depending on whether they are congenitally deaf individuals of hearing parents or congenitally deaf individuals of deaf parents. We compared age and sex between the two groups.

Table 1

Descriptive statistics for the measurement instrument

SEX	PARENTS	PD STATE	State Percentile	State Decatype	PD TRAIT	Trait Percentile	Trait Decatype
F	CD-HP	20	65	6	31	77	7
F	CD-HP	22	70	7	43	95	9
F	CD-DP	2	3	2	12	13	3
M	CD-HP	36	97	9	26	77	7
M	CD-DP	9	25	4	18	50	6
M	CD-DP	10	25	4	16	45	5
F	CD-DP	29	80	7	32	80	7
F	CD-HP	51	99	10	56	99	10
F	CD-DP	10	23	4	14	20	4
F	CD-DP	17	55	6	19	40	5
F	CD-HP	26	75	7	23	50	6
M	CD-HP	26	85	8	24	75	7

Note. F (female); M (male); CD-HP (congenitally deaf persons of hearing parents); CD-DP (congenitally deaf persons of deaf parents)

Second, the normality tests show that state anxiety and trait anxiety were distributed normally (*KS*=0.185 *p*=.200; *KS*=0.203 *p*=.183). The homogeneity tests revealed that the variances are homogenous between the groups in both state anxiety ($F_{(1.10)}$=2.424; *p*=.151) and trait anxiety ($F_{(1.10)}$; *p*=.537). Although the criteria of normality and homogeneity of the variances were fulfilled, owing to the small sample size, we decided to use non-parametric tests.

Third, we analysed the types of statistically significant relationships between some of the study variables. A comparison of the groups by age and sex revealed no significant differences according to age (*Z*=-0.480; *p*=.631) or sex (X^2=0; *p*=1). These results suggest the groups are comparable in their demographic aspects.

However, statistically significant differences were found in the analysis of state anxiety. There were differences between the groups (*Z*=-2.406; *p*=.016) and the effect size was large (Hedges' g= 2.008).

As regards the trait anxiety variable, the tests show differences between the groups (*Z*=-2,169; *p*=.030) and a large effect size (Hedges' g= 1.692). The deaf persons of hearing parents scored higher than those of deaf parents.

Presentación clara de los resultados obtenidos.

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Discussion and conclusions

Studying deaf people and their level of anxiety according to the type of parents (deaf or hearing) is of great importance to determine their emotional status (Meadow-Orlans, 2001; De Santis, 2011; Wolters et al., 2012) and self-esteem (Woolfe & Smith, 2001).

This study confirms the first hypothesis that anxiety in deaf population differs according to whether the parents are deaf or hearing. Having parents that are hearing at the moment of birth may lead deaf individuals to develop a higher level of anxiety compared to those whose parents are deaf. Courtin (2000) showed that deaf children of hearing parents typically receive fewer explanations and that these tend to be less complete, complex and abstract compared to those provided by deaf parents. This phenomenon, as well as limiting the child's possibility of greater development of language skills, reduces their opportunities to learn about social and emotional states and their characteristics (Marschark & Spencer, 2010). Besides, hearing parents find it difficult to learn sign language and they prefer hearing and speech as their child's communication mode

Our findings also support the second and third hypotheses in that congenitally deaf individuals of normally hearing parents scored significantly higher on both trait and state. As mentioned, Meadow-Orlans (2001) reported that the diagnosis of deafness is much more traumatic for parents that are normally hearing, and, after the diagnosis, they begin to feel incompetent in their communication with their child and often feel blocked, leading to poorer stimulation at the very time when it should be stronger. The fear of not being understood and the shortcomings of the adult communication model generate a sort of “linguistic overprotection” (De Santis, 2011). This fear is often unconscious, leading parents to reduce the messages they transmit to the deaf child, limiting the linguistic complexity (Schlesinger, 1987 cited in De Santis, 2011; Druet & Escalante, 1998). Hearing parents tend to have a strong preference for their deaf to acquire adequate speech, to promote the inclusion of their children in the hearing world. Some of them appreciate sign language as the means of access to the Deaf community. However, most hearing parents do not know sign language when their child is diagnosed with deaf and acquiring proficiency in this mode of communication is a long and arduous process for them (Goldblat et al., 2020). However, deaf individuals felt closer to deaf parents and deaf siblings than to hearing parents and hearing siblings (Woolfe & Smith, 2001).

Similar studies are needed, which take into account the importance of assessing in sign language, in order to determine without the difficulty of being evaluated in a second language. Thus, results that are more representative of the deaf population would be obtained.

Further studies are necessary comparing different variables according to whether participants were born in a family with hearing parents or deaf parents. This would help determine preventive elements and the actions to be implemented for all deaf children to be diagnosed as early as possible and so receive the appropriate actions from the family and the correct health and social interventions needed to help avoid their emotional and social future being affected.

Finally, the present study is not without limitations. First, the sample size is very small, as we were obliged to reduce the sample of deaf participants of hearing parents as the population of deaf individuals of deaf parents is very reduced; in this case, 50% of the members registered in the Euskal Gorrak association. We believe that similar studies to ours would help give a greater capacity for the findings to be generalised, and, thus, it is important to continue investigating in this line. Second, it is key to place the emphasis on the first language of congenitally deaf persons, namely, sign language, considering that any other language is their second language. It would be of interest to see if this has an impact on results in future studies. Third, further studies are needed in deaf population using the adaptation of the STAI to sign language, in order to reliably measure its consistency with the original inventory.

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