Effect of parent interaction on language development in children

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Background
Positive quality of parent–child interactions is essential for shaping a child's language development. Many individual factors have been found to be associated with language development, but their interaction with each other and their relation with language development is still less clear.

Objective
The aim of the study was to evaluate whether the quantity and quality of parent–child interactions contribute to language development and to detect the factors that would influence this interaction in different socioeconomic standards to consider them while planning the therapy program.

Patients and methods
This study included 100 parents and their children; they were attendants at the Phoniatric Unit of Kasr Al Aini Hospital, complaining of delayed language development in their children. Parents included 60 women and 40 men; their ages ranged between 21 and 43 years, with a mean age of 32.7 ± 5.5 years. The age range of the children was 27–49 months, with a mean of 38 ± 5.7 months. The parents were asked to fill in a questionnaire, which was divided into two sections (A and B). Section A described the parents' communicative behavior and section B included basic information on the parents and their beliefs about causes and management of delayed language development. Socioeconomic status of the parents was assessed. Children included in the study were subjected to the protocol of language assessment.

Results
Results indicate that the majority of the included parents did not use effective methods to foster their child's language acquisition, although their knowledge about language development and intervention was adequate. There was a significant positive association between the parent's interaction score and the child's total language age. Socioeconomic status has been shown to be a significant predictor of a child's language outcomes.

Conclusion
Parent–child interaction is an important variable in the development of a child's language. Future research and intervention services should focus on increasing the quality of these interactions.

Keywords:
language development, parent interaction, socioeconomic status

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Introduction

Language development among children is a complex process that is foundational to their communication skills, school readiness, and achievements. Parents are the primary people engaging and interacting with infants on a consistent basis; consequently, parents are seen as a child's first teacher. Positive quality of parent–child interactions and increased verbal responsiveness are essential in shaping a child's literacy environment and language development. The first 3 years are the most intensive, as this is when the brain rapidly develops and is able to learn new information. If this critical period passes without adequate interaction and opportunity for language development, it will become more challenging to accomplish the milestones as the child develops [1,2].

Parental perceptions are essential to the development of parent–child interactions. Understanding the ways in which parents perceive language development, difficulties, and intervention would allow speech and language therapists to be more sensitive to the needs of the families with whom they work, and would reduce the likelihood of parents misconstruing the purposes and processes involved in therapy. This, in turn, may affect uptake of, attendance to, participation in, and satisfaction with therapy [3]. Crosscultural variations in child-rearing practices have been well documented. However, limited data are available with regard to the opinion of parents or speech and language therapists on the nature of language development, difficulties, and interventions [4].

Language and conceptual development involve many factors; socioeconomic status (SES) is considered

one of the many important factors linked to language development as it encapsulates differences in parental beliefs, attitudes, motivations, and behaviors. A vast body of research has been dedicated to understanding the social–contextual factors that support children's early language development and learning. Many individual factors have been found to be associated with language development, but their interaction with each other and their relationship with language development is still unclear [5–8].

It is hypothesized that different parent–child interaction patterns could play a major role in holding back or facilitating a child's language development. To verify this hypothesis, an analysis of parent–child interactions was designed. The aim of the present study was to assess whether the quantity and quality of parent–child interactions contribute to language development and to detect the factors that would influence this interaction in different socioeconomic standards, to consider them while planning the therapy program.

Patients and methods

This study included 100 parents and their children; they were attendants at the Phoniatric Unit of Kasr Al Aini Hospital, with complaints of delayed language development in their children. The parents included 60 women and 40 men; their ages ranged between 21 and 43 years, with a mean age of 32.7 ± 5.5 years. The age range of the children was 27–49 months, with a mean age of 38 ± 5.7 months. This study was conducted from March 2013 until January 2014. Among the included participants, 51 (51%) parents were consulting a physician for the first time, 26 (26%) had consulted a clinician previously and had come for a second opinion for their child's problem, and 23 (23%) of the included children had undergone language stimulation sessions for a duration of 1–3 months, with a mean of 2.2 months.

Written consent was obtained from the parents before the study; parents were then asked to fill in a questionnaire, which was divided into two sections (A and B). Section A elicited the parents' communicative behavior (i.e. the quality and quantity of parental interactions with their children). Quality was detected in terms of the use of various strategies by parents that would enhance their child's language acquisition. The frequency of interactions was measured using a three-point scale (never, sometimes, most of the time). Section B included basic information on the parents and their opinions on the causes and management of delayed language development (Appendix 1). The socioeconomic status of the parents was assessed according to the scale developed by El-Gilanny *et al.* [9], which measured six domains: a score was assigned for each item and the total score was calculated (Appendix 2). At the end of the interview, parents were instructed on how to interact with their child to facilitate language acquisition; they were then asked for their opinion on whether they would be able to implement those interactions.

Children included in the study were subjected to the protocol of language assessment applied at Kasr Al Aini [10] to confirm the diagnosis, and they were selected if they had a Stanford–Binet test of intelligence score of 89 or higher. Children with a history of hearing impairment, those with psychiatric, neurological, or developmental disorders, and those with severe medical conditions were excluded from the study.

Statistical analysis

Data analysis was carried out using SPSS software program for Windows, version 21 (SPSS Inc., Chicago, Illinois, USA). Data were expressed as number and percentage for qualitative variables and mean and SD for quantitative variables. Cronbach's α for reliability was calculated for questionnaire consistency. Pearson's or Spearman's correlation coefficients were calculated for the association of different quantitative variables. Standard linear regression analysis was carried out to explore the significant predictors of total language age. *P*-values less than 0.05 were considered significant.

Results

This study included 100 parents and their children. The frequency distribution of parent–child interactions is shown in Table 1. Mean, SD, range, and interquartile range (IQR) for the total interaction % score are shown in Table 3. Interaction % score was classified into insufficient (<50%) and sufficient (^{3}50%). Results show that 93 (93%) of the included parents had insufficient interactions and seven (7%) had sufficient interactions.

Table 2 shows parents knowledge about language development and intervention. Mean, SD, range, and IQR for the total knowledge % score are shown in Table 3. Total knowledge % score was classified into inadequate (<50%), adequate (50–70%), and excellent (<70%). It was found that 18 (18%) of the included parents had inadequate knowledge, 78 (78%) had adequate knowledge, and four (4%) had excellent knowledge.

Mean, SD, range, and IQR for SES are shown in Table 3. The total SES score was 61; hence, the score of two cutoff points was selected to categorize SES into three levels (low, intermediate, and high SES). The two

Appendix 1. Parent–child interactions

Section A (quality and frequency of parent–child interactions)

Quality of interaction	Frequency of interaction		
	Never	Sometimes	Most of the time
Face your child			
Select certain time			
Let your child lead			
Use or practice parallel talk			
Self-talk			
Vary tone while speaking			
Slow your speech rate			
Use simple short sentences			
Label surroundings			
Wait for your child to communicate			
Repeat daily routine			
Introduce new activities			
Imitate his/her actions			
Respond immediately			
Use gestures to convey meaning			
Emphasize your facial expressions			
Show the objects you are talking about			
Talk about here and now			
Physically involved with child during play			
Joint attention			
Model a certain behavior			
Use reinforcers			
Does your child express his/her needs verbally?			
Does your child express his/her needs nonverbally?			
Do you ask your child what he wants?			
Do you give him a small amount and let him ask for more?			
Do you correct your child's utterances?			
Expand your child's utterance			
Use keywords to convey the meaning			

Section B (parents beliefs and knowledge about language development)

	Yes	No
When do you seek professional advice?		
I feel my child has a problem		
I compare him with a relative or his/her peers		
School/nursery informed me		
If you suspect your child has a language problem		
I would ask a friend/relative		
I have past experience with other siblings		
Ask a clinician		
Handle on my own (internet search/reading)		
Is your child's delay related to his/her		
Brain		
Hearing		
Intelligence		
Environment		
Hereditary		
Do you think your child's delay is		
Mild		
Moderate		
Severe		
Which physician you need to visit first		
Pediatrician		
Psychiatrists		
Neurologists		
Phoniatrician		
ENT/audiology		
Which line of treatment do you feel your child needs?		
Medications only		
Language stimulation sessions		
Diet therapy		
Counseling and follow-up		
Hyperbaric O_2		
Behavior modification therapy		
Going to nursery		
Do you think that the nursery/school plays a role if your child has a problem?		
Nursery deals alone		
Parents deal alone		
Share responsibility with the parents		
I will not inform them about my child's problem		
If your child has a behavioral problem, is it		
Related to his/her language problem		
Not related to his/her language problem		
Might affect his/her academic performance		
How can you describe your child's problem?		
It is only a communication problem		
It is behavior problem		
It involves both communication and behavior		
Increased activity level		
Poor academic achievement		
Which problem are you more concerned about?		
Behavior		
Speech		
Academic achievement		
More than one		
Do you prefer that your child:		
Receive counseling sessions only		
Receive language stimulation sessions only		
Receive counseling and language stimulation sessions		
Do you think		
Watching TV a lot is beneficial in language acquisition		
Parent should watch a TV program with his/her child		
Child should not watch TV		
Do you think your interaction with your child affects his/her behavior?		
Do you think		
Interactions with the child are mainly a mother's job?		
Mothers and fathers should share equal responsibility		
Siblings should be involved		
All family members should be involved		

Appendix 2: Socioeconomic standard assessment

1. Education and cultural domain

Educational level (for each partner) total (28)

	Illiterate	Read and write	Primary	Preparatory	Secondary or technical	Intermediate (2 years) institutes	University	Postgraduate
Husband	0	2	4	6	8	10	12	14
Wife	0	2	4	6	8	10	12	14

Access to health information (one each for the following items): total (2)

Printed materials; for example, books, posters, booklets	Audiovisual message on television and/or radio
If yes→(1), if No→(0)	If yes→(1), if No→(0)

2. Occupation domain

Occupation (for each partner) total (10)

	Nonworking/house wife	Unskilled manual worker	Skilled manual worker/farmer	Trades/business	Semiprofessional/ clerk	Professional
Husband	0	1	2	3	4	5
Wife	0	1	2	3	4	5

3. Family domain

Residence: (2)

Urban slum	Rural	Urban
0	1	2

Number of family members: (2)

<5 members	≥5 members
2	1

Number of earning family members: (3)

One member	Two members	≥3 members
1	2	3

Education of children (aged ≥5 years): (3)

All	≥50%	<50%	None
3	2	1	0

4. Home sanitation domain

Crowing index: (number of family members divided by number of rooms): (1)

≤1 person per room	>1 person per room
1	0

5. Economic domain

Income from all sources: (3)

In debt	Just meet routine expenses	Meet routine expenses and emergencies	Able to save/invest money
0	1	2	3

Family receives governmental support: (1)

Yes	No
1	0

Family pays tax: (1)

Yes	No
1	0

6. Healthcare domain

Usual source of healthcare: (5)

Private	Insurance	Free	More than one	Traditional or self-care
5	4	3	2	1

Table 1 Frequency distribution of parent–child interactions

Quality of interaction	Never [*N* (%)]	Sometimes [*N* (%)]	Most of the time [*N* (%)]
Face your child	50	48	2
Select certain time	58	42	0
Let your child lead	77	23	0
Use or practice parallel talk	86	14	0
Self-talk	61	39	0
Vary tone while speaking	53	47	0
Slow your speech rate	65	24	11
Use simple short sentences	58	34	8
Label surroundings	50	42	8
Wait for your child to communicate	21	70	9
Repeat daily routine	0	35	65
Introduce new activities	1	70	29
Imitate his/her actions	39	59	2
Respond immediately	44	56	0
Use gestures to convey meaning	68	31	1
Emphasize your facial expressions	78	20	2
Show the objects you are talking about	2	72	26
Talk about here and now	4	78	18
Physically involved with child during play	60	35	5
Joint attention	51	48	1
Model a certain behavior	55	44	1
Use reinforcers	3	65	32
Does your child express his/her needs verbally?	12	78	10
Does your child express his/her needs nonverbally?	35	43	22
Do you ask your child what he wants?	4	73	23
Do you give him a small amount and let him ask for more?	76	23	1
Do you correct your child's utterances?	20	61	19
Expand your child's utterance	60	34	6
Use keywords to convey the meaning	95	5	0

Cronbach's $\alpha = 0.796$.

points were 20 and 40; accordingly, SES was classified into three categories as follows:

(1) 20 or lower (low SES)
(2) 21–40 (intermediate SES)
(3) 41 or higher (high SES)

It was found that 81 (81%) of the included parents had an intermediate score and 19 (19%) had a high score.

Language age was calculated for each child, range 12–34 months; mean 19.3 ± 5.9. Table 4 shows a significant association between the knowledge % score, the interaction % score, and the language age.

Multivariate analysis was carried out to explore the variables affecting the total language age (SES, total interaction score, total knowledge score). SES was

Table 2 Parents knowledge about language development

Parents' knowledge	Yes [*N* (%)]	No [*N* (%)]
When do you seek professional advice		
I feel my child has a problem	44	56
I compare him with a relative or his/her peers	61	39
School/nursery informs me	19	81
If you suspect your child has a language problem		
I would ask a friend/relative	36	64
I have past experience with other siblings	36	64
Ask a clinician	51	49
Handle on my own (internet search/reading)	18	82
Is your child's delay related to his/her		
Brain	3	97
Hearing	0	100
Intelligence	1	99
Environment	54	46
Hereditary	44	56
Do you think your child's delay is		
Mild	63	
Moderate	36	
Severe	1	
Which physician you need to visit first		
Pediatrician	39	61
Psychiatrists	3	97
Neurologists	14	86
Phoniatrician	25	75
ENT/audiology	13	87
Which line of treatment do you feel your child needs?		
Medications only	25	75
Language stimulation sessions	60	40
Diet therapy	3	97
Counseling and follow-up	23	77
Hyperbaric O_2	5	95
Behavior modification therapy	7	93
Going to nursery	61	39
Do you think that the nursery/school plays a role if your child has a problem?		
Nursery deals alone	24	76
Parents deal alone	2	98
Shares responsibility with the parents	50	50
I will not inform them about my child's problem	20	80
If your child has a behavioral problem, is it		
Related to his/her language problem	54	46
Not related to his/her language problem	37	63
Might affect his/her academic performance	35	65
How can you describe your child's problem?		
It is only a communication problem	75	25
It is a behavioral problem	9	91
It is a communication and behavioral problem	16	84
Increased activity level	1	99
Poor academic achievement	10	90
Which problem are you more concerned about?		
Behavior	11	89
Speech	90	10
Academic achievement	12	88
More than one	4	96
Do you prefer that your child:		
Receive counseling sessions only	26	74
Receive language stimulation sessions only	21	79
Receive counseling and language stimulation sessions	53	47
Do you think		
Watching TV a lot is beneficial in language acquisition	36	64
Parent should watch a TV program with his/her child	62	38
Child should not watch TV	2	98

(Continued)

Table 2 (Continued)

Parents' knowledge	Yes [*N* (%)]	No [*N* (%)]
Do you think your interaction with your child affects his/her behavior?	36	64
Do you think		
Interactions with the child are mainly a mother's job	13	87
Mothers and fathers should share equal responsibility	35	65
Siblings should be involved	13	87
All family members should be involved	76	24

Cronbach's α = 0.585, but after excluding questions 1.1, 2.1, 8.1, 9.1, and 12.1 it becomes 0.744.

Table 3 Mean, SD, range, and interquartile range for the variables included in the study

Variables	Range	Mean ± SD	IQR
Educational domain	8–24	17.2 ± 3.5	14–20
Access to health information domain	0–2	1.3 ± 0.8	1–2
Occupational domain	2–9	5.7 ± 1.4	5–7
Family domain	4–9	6.6 ± 1.1	6–7
Home sanitation domain	0–1	0.4 ± 0.5	0–1
Economic domain	0–4	1.4 ± 0.7	1–2
Healthcare domain	2–4	2.3 ± 0.5	2–3
Socioeconomic standard	20–48	34.8 ± 5.9	31–39.5
Total knowledge % score	44.1–76.3	59.3 ± 7.8	52.5–66.1
Total interaction % score	18.4–55.3	37.4 ± 8.4	31.6–43.4

IQR, interquartile range.

found to be a significant predictor of a child's language age (P = 0.002).

Table 4 The Pearson correlation coefficient (*r*) of total language age, total interaction % score, and total knowledge % score with other parameters

Parameters	Total language age	Total interaction % score	Total knowledge % score
Total interaction % score			
r	0.342		
P-value	<0.001*		
Total knowledge % score			
r	0.317	0.615	
P-value	0.001*	<0.001*	
SES			
r	0.449	0.572	0.471
P-value	<0.001*	<0.001*	<0.001*
Educational domain			
r	0.399	0.462	0.414
P-value	<0.001*	<0.001*	<0.001*
Access to health information domain			
r	0.186	0.424	0.436
P-value	0.064	<0.001*	<0.001*
Occupational domain			
r	0.301	0.435	0.386
P-value	0.002*	<0.001*	<0.001*
Family domain			
r	0.391	0.531	0.362
P-value	<0.001*	<0.001*	<0.001*
Home sanitation domain			
r	0.16	0.229	0.083
P-value	0.112	0.022*	0.411
Economic domain			
r	0.28	0.251	0.116
P-value	0.005*	0.012*	0.249
Healthcare domain			
r	−0.045	−0.125	−0.159
P-value	0.656	0.215	0.114

r, Pearson's correlation coefficient; *Statistically significant at $P \leq 0.05$.

Discussion

The primary purpose of this study was to understand the relationship between parent–child interaction and language acquisition; a secondary intent was to determine the presence of any possible relationship between socioeconomic standard and the parents' communicative behavior. Results indicate that the majority of the included parents did not use effective methods to foster their child's language acquisition, although their knowledge about language development and intervention was adequate, and this was associated with the child's language outcome among the included socioeconomic standards.

The present findings reveal that the quality and quantity of parent–child interactions in the majority of the studied sample (93%) were defective in providing an enriching and stimulating environment necessary for language acquisition, and this was reflected in the significant positive association between the interaction score % and a child' total language age (Table 4). Several studies found similar findings [11–15]. It was evident from the majority of parent reports that the parents failed to create an ideal setting while interacting with their child, and their communication style and responses to their children were poor. Mothers reported that their verbal interactions mainly included asking questions, corrections, and instructions. A large number of parents (60%) reported that they were not actively involved with their child, who was left to play alone or with other siblings; they were less likely to consider that children learn important things while playing and emphasized the role of direct teaching and imitating others. Sixty-five percent of the included parents reported that they participated in routine activities with their children. Raikes *et al.* [16] reported that frequent and consistent participation in routine activities provides young children with a familiar structure for interpreting others' behavior and language, helps them anticipate the temporal sequencing of events, provides rich information about objects and

events in the environment, and allows them to draw inferences from new experiences.

A possible explanation for the relationship between quality of interaction and language outcome was offered by Umek *et al.* [17]; in their study, they found that the quality of verbal interactions between a parent and child during reading and play-time stimulates the child's language development, improves his/her vocabulary skills and reading comprehension, and increases his/her school readiness. Parents who contingently respond to their children's verbal initiatives tend to have children with advanced phonological awareness and story comprehension skills. The role of maternal interaction with their child was emphasized by several studies [18–20], they recommended frequent maternal labeling, expansion of child's utterances, speaking to the child in a grammatically correct fashion, and interactive story telling.

The present data provide evidence that parent interactions are associated with language outcome; however, it was not obvious whether the quality or quantity of parent interaction was a predictor of language development. Several studies emphasize that the quality of the interactions may be a better predictor of achievement scores than quantity [7,12,21,22]. Morales *et al.* [23] reported that following the child's lead and maintaining joint attention were more effective in increasing a child's vocabulary than high maternal vocabulary alone. Westerlund and Lagerberg [20] found that parents who were warm and accepting while interacting with their child had interactions that involved follow through (reciprocity) and sustained engagement (synchrony) on the part of the child.

An unexpected finding was that the majority of the included parents (78%) had adequate information about language development and intervention, and there was a strong positive association between parental knowledge and interaction scores and a weaker interaction with language scores (Table 4). It was noted from parental opinions about the possible cause of delay in their child's language development that 51% considered much of a child's language learning to be incidental and reported that the home environment had a powerful influence in enhancing or hindering language acquisition. Peacey [24] reported a similar finding. Others suggested that the problem was due to hereditary factors, difficulties within the family, lack of time to spend with the child, inconsistency in the implementation of strategies that would facilitate language acquisition, and difficulty in dealing with stubborn or noncompliant children. Few parents were uncertain or confused about the reasons for delayed language development, and others blamed themselves because they felt that these problems reflected badly on their parenting abilities. Parental concerns were consistent with the finding of Ayoub *et al.* [25]; they suggested that children with lower language skills may be more stressful for parents to interact with.

In the current study, it was obvious that parents had different views about the effectiveness of interventions; accordingly, their willingness to be involved in the therapy process varied. In this study many parents (61%) considered that the nursery would be the main solution to enhance their child's social and communication problem. Thirty-six percent suggested that watching television would be effective, as they believed that their children needed to 'see and hear more' than the immediate family surroundings to acquire new vocabulary. A minority (25%) thought that medication would help increase their child's concentration, whereas others took language development for granted and were waiting for spontaneous recovery given that their child had no organic abnormality. It was also evident that there were discrepancies in the evaluation of the child's problem by parents and clinicians. Few parents reported that their children had received therapy and counseling; however, they failed to make all the recommended linguistic adjustments and/or did not find expected improvement. The results of this study added to previous research [26–28].

It emerged from some parents' accounts after completion of the questionnaire that they were surprised at the expectation that they would have to take part in treatment and reported that they would not be able to implement the interactions that would enhance their child's language acquisition. Several reasons were given: Some parents reported that they were not convinced that it would work, some claimed that they did not have the necessary skills to communicate effectively with their child as they were impatient and wanted a quick response, and some claimed that other family members were not helping. It also seemed that, although some parents were willing to be involved in their child's therapy, they believed that a therapist needed to be involved and to administer the bulk of the therapy. The variation in the extent of parental involvement might reflect the fact that what may be effective for one family may be inappropriate for another.

With regard to the effect of SES, the present data revealed a strong positive association with total interaction score and to a lesser extent with knowledge score and child's language age; this highlights the impact of socioeconomic factors (Table 4). In agreement with this finding, other studies [29,30] found that middle-SES and high-SES parents were more likely to engage in long conversations

with their children, verbalized more to their children, participated more actively in their child's play, were more didactic, responsive, and elaborative, and practiced fewer penalizing behaviors during interaction.

In the current study, the differences between financial status, level of parental education, occupation, and number of children in the included families might have contributed to the different outcomes. A small association was found between poverty and differences in parent talk and language delay. It is assumed that parents who are preoccupied with the stress of everyday life may perceive the needs of their child as an additional and overwhelming stress and fail to establish a reciprocal or emotional relationship with their child. Poverty might influence the quality of environmental support, the availability of material resources, and the provision of age-appropriate earning materials, adequate nutrition, and medical care. Data on the aspect(s) of poverty that are causally related to language delay are incomplete [22,25,31]. The present data also show that parents' occupations and education were more significantly associated with the outcome than their economic status (Table 4). Education permits different life experiences, which might influence parental values and child-rearing practices, and this was evident in the significant positive association between parents' access to health information and their knowledge and interaction scores. Several studies found similar results [6,14,15,30,32]. Ruhm [33] and Pancsofar *et al.* [34] suggested that maternal employment can negatively impact the quality of parenting interactions because of less time spent by the mothers with their children.

The present data reveal a significant positive association between the home sanitation domain (measured by crowding index) and interaction scores. It was expected that a large number of siblings would act as a barrier to responsiveness of parents to their children. Evidence from previous studies suggests poor cognitive, language, social, and behavioral outcomes [3,35,36].

SES has been shown to be a significant predictor of child language outcomes. However, it is possible that even in the presence of demographic-related barriers, a child's language skills can be improved if parenting behaviors are enhanced. As demographic characteristics are rather stable and present a challenge for change, parental behaviors appear to be a critical point of intervention for a child's language acquisition.

Strengths and limitations

Strengths

The interpretation of parental accounts enriches our understanding of parents' perspectives about language development, delay, and intervention. The study includes a relatively large sample of families with different socioeconomic levels. It used reliable and valid measures (detailed interviews as well as questionnaires) of parental interaction quality with a verbal outcome measure, and examined the association between socioeconomic variables and outcome.

Limitations

The study did not include ratings from direct observation of parents with their children; in addition, it was not possible to identify the contributions solely from each parent interaction and different language outcomes.

Conclusion

(1) Parent–child interaction is an important variable in language development of a child.
(2) Future research should focus on increasing the quality of these interactions; this would involve providing parents with education aimed at increasing the sophistication of their language skills.
(3) Our study highlights the need to understand the constituents of an appropriate environment for a child. Phoniatricians should investigate and take into account socioeconomic variables to work more successfully with families from a wide range of backgrounds.

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Conflicts of interest

There are no conflicts of interest to declare.

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