

# Bio-ecological systems theory



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**Abstract**

This paper is about the Bio-Ecological Systems theory of Urie Bronfenbrenner. Bronfenbrenner's Bio-Ecological Systems Theory concerns the environmental influences on a child's development. He observed that these influences were comprised of relationships around the child and these relationships have layers of interaction between the child's and the child's environment. He called these layers 'systems'. These events start with direct influence on the student and progress outward until the events have only minimal, indirect influence. Next it will discuss a minority population which is deafness. There are two main forms of hearing loss and five levels of severity. After the child's hearing loss is identified the parents need to choose what technology they want their child to use. The next obstacle for parents is how and where to educate their child. Then it will discuss how the theory applies to a particular student of this minority population. And lastly it will discuss the educational considerations and recommendations revealed from applying the theory to this student. It will also consider which educational theorists apply to this student. By considering the student more holistically, rather than only what happens presently in the classroom, it will help the instructor develop a teaching plan for this student to maximize his learning potential.

**Bronfenbrenner's Bio- Ecological Systems Theory: As Applied to a Deaf Student**

Bronfenbrenner's Bio-Ecological Systems Theory concerns the environmental influences on a child's development. He observed that these influences were comprised of relationships around the child and these relationships have layers of interaction between the child's and the child's

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environment. He called these layers ‘ systems’ and they consisted of five different levels of influence. These events start with direct influence on the student and progress outward until the events have only minimal, indirect influence. The five systems that were recognized by Bronfenbrenner are as follows: 1. Microsystems- the immediate environment of the child which has the most impact on the child’s development, for example the relationship between the child and his parents, the child and his peers, or the child and his school. 2. Mesosystems- the connections between the microsystems, where the systems overlap, these also have a direct impact on the child’s development; for example, the interaction between the child’s peers and the child’s parent or the interaction between the child’s parents and the child’s school.

3. Exosystems- the next level of events in the environment are further from the child but nevertheless have impact on the child’s development; for example, problems with the parents’ work (indirect events) which causes tension in the home (direct event)

4. Macrosystems- the larger cultural environment that the family lives in; for example the economy of the area the family lives which contributes to the work opportunities for the parents 5. Chronosystems- the transitional events in the child’s life as he grows up; for example the changes incurred by moving from middle school to high school.

The “ otheredness” of my student is deafness. I believe deafness is a minority condition because the “ National Center for Health Statistics places the number of profoundly deaf in the U. S. at more than 400, 000, while

people classified as hard-of-hearing number over 20 million, or about 8 percent of the total population”. (Bacon, 2002) Even though deafness has received some attention through television shows and movies, there are still many misconceptions about deaf people and their social and educational needs.

There are two main forms of hearing loss. One type of hearing loss is a conductive loss which is “ usually temporary interference with the reception of sound from the outer ear to the middle or inner ear”. (Turkington, C., & Tzeel, A., 2004). This means that various parts of the ear are not functioning properly like the ear drum or bones of the middles ear. A conductive hearing loss can sometimes be corrected by surgery. The other type of hearing loss is sensorinueral, which is a “ permanent abnormality of the cochlear hair cells of the inner ear, the auditory nerve, or the auditory center of the brain.” (Turkington, C., & Tzeel, A., 2004). Presently there is no way to repair this type of hearing loss.

Also to be considered is the severity of hearing loss. According to the Encyclopedia of Children’s Health, there are five classifications. Each classification is expressed in decibels which are the units of measurement used to measure sound. The classifications are as follows.

- Mild, in which a child hears, sounds from 26-40 dB. Speech and conversation are usually unaffected but distant sounds may be difficult to hear.
- Moderate, in which a child hears sounds from 41-70 dB. The ability to form sounds and hear normal conversation is affected.

- Severe, in which a child hears, sounds from 71-90 dB. The child requires a hearing aid to hear conversations.
- Profound, in which a child can only hear, sounds above 90 dB. A hearing aid may help but the child will not be able to articulate words normally

(Turkington, C., & Tzeel, A., 2004).

After the child's hearing loss is identified the parents need to choose what technology they want their child to use. The options are either a hearing aid or cochlear implant surgery. There are pros and cons to each of these, and not all children are good candidates. So it is incumbent upon the parents to investigate what the most appropriate option for their child and his particular hearing loss.

Deaf children historically have been educated in one of two ways. The first is called the Oral Method which requires hearing aids, extensive speech therapy, and speech reading lessons in addition to the grade appropriate educational concepts. The second is the Manual Method, which uses sign language as the basis for instruction and conversation for students. Most schools at this time use some form of Total Communication, which is signing with concept appropriate signs and some speaking along with speech therapy. Another method used in some residential deaf schools is called Bilingual/Bicultural, which uses American Sign Language and deaf culture as a first language and culture. This method incorporates the English language and hearing culture through reading and writing as a second language and culture.

Unfortunately, the experts that parents meet after identifying their child's hearing loss have divided opinions over the appropriate manner to educate deaf children. This usually confuses parents and delays the choices of language development and later education for the child. The next educational obstacle for parents is where to educate their child. At this time the options are to mainstream (to include the child in “ regular” classrooms at the local school with an interpreter/aid for support) or send them to a residential deaf school. The only residential school for the deaf in Florida is the Florida School for the Deaf and Blind in St. Augustine, FL. Residential schools “ offer a combination of residential and day schools, the special focus is on the development of literacy skills in American Sign Language and English. Most of them also foster an appreciation for deaf culture – where deafness is not considered a disability but a distinct alternative culture with its own language and identity.” (“ Listening to the Needs of Deaf and Hard of Hearing Children,” 2000) The students board in the dorms during the week but are bused home every weekend.

### **Case Study**

My student was born with a profound (above 90db) sensorineural hearing loss. He is a twenty year old deaf man whom I have known since he was four when he joined my Prekindergarten Deaf and Hard of Hearing class. His microsystems were made up of five areas. First is his family consisting of his mom, his dad, his sister, and his Grandmother who was also deaf. Next was his school, Valparaiso elementary school. His peers were the other students in the Prekindergarten class. His neighborhood was in Fort Walton Beach, FL,

about thirty minutes from the school. Lastly the electronic media he was allowed was a little computer time and the TV.

The mesosystems at that time were with his family and his school, and his peers and his family. There was extensive interaction between the teachers and interpreters at school with his mother and sister through parent-teacher conferences, Individual Education Plan (IEP) meetings, and student programs. The other interaction was between his classmates and his family; from time to time the classmates would visit his home. He never visited his classmates' homes due to health issues.

The exosystems in his life were his parents work, the health care system of Medicaid, transportation, and the school board. His parents' work consisted of his mom working as a cook and his dad as a construction worker. He was under Medicaid, which supplied his hearing aids and helped with a bowel problem he had that would ultimately be diagnosed and corrected by surgery. (Throughout his elementary years the student wore diapers due to this intestinal problem which caused some embarrassment for him.) The last exosystem was the school board which controlled the types of programs provided to the student. Fortunately these programs were what this student needed for his language and educational needs.

The macrosystem in play for this family was the economy which affected Mom and Dad's jobs. Both of these jobs were unpredictable due to the fluctuations in the tourist trade so their income was not consistent and this caused considerable tension in the home. And the low socioeconomic level of his neighborhood as evidence by the local elementary school being a Title I

school. Title I is part of the Elementary and Secondary Education Act of 1965. " Title I provides funding and guidelines for educating " educationally disadvantaged" children. These programs are intended to meet the special educational needs of " educationally deprived" children and school districts with high concentrations of such students, who typically are from poor families." (" Elementary and Secondary Education Act," 2004)

There were seven major transitions in the students' life. The chronosystems, which are these transitions, start with his coming to school at Valparaiso Elementary. Starting school brought new peers, most of them deaf and new adults, the teachers and interpreters as well as other adults in the school population. He also started riding a bus for the first time and had much less time to play in his neighborhood because the school was located about thirty minutes from home. His second transition was when he attended Lewis Middle School. The microsystems that changed in this move were new teachers and interpreters, and new hearing peers. Also, the electronic media in his life changed; he was given a Sprint Sidekick text message phone and an X-box game system. The third transition was when he moved to high school, and his family microsystem changed dramatically. His father opted out of his life at this time and has continued to stay out. Also his deaf grandmother died. Finally, he, his mother and sister moved to St. Augustine, FL in order for him to go to the Florida School for the Deaf and Blind. At this new school he was faced with new peers and teachers. He remained there a mere three months for two reasons. The first was his personal unhappiness at the Florida School for the Deaf and Blind. He felt rejected by the other deaf students. And secondly, his mother was not able to find employment.



His fourth transition was to move to Indiana. Although he and his mother wanted to move back to Niceville, she could not find employment so they moved in with his brother in Indiana for the remainder of that school year. With this move he lost the immediate influence of his sister who had been a stabilizing presence in his life. She met and later married a naval man so she stayed in Jacksonville instead of moving with the family. This new school microsystem brought another new set of teachers, interpreters, and peers, both hearing and deaf. The fifth transition was for him and his mother to move back to Niceville. Upon his return to Niceville he was reunited with some of his most supportive microsystems. At school he reconnected with former interpreters and teachers. He also reconnected with old deaf and hearing friends which resulted in strengthening his peer microsystems. His sixth transition was to start school at Northwest Florida State College where he has encountered a new school microsystem with new teachers and interpreters. He also has both old and new peers at the college. The last transition occurred this past summer when he got a cochlear implant. A cochlear implant is a “ surgical treatment for hearing loss that works like an artificial human cochlea in the inner ear, helping to send sound from the ear to the brain. As many as 24 electrodes (depending on the type of implant) carry the impulses that stimulate the hearing nerve. The brain then interprets the signals as specific sounds”. (“ Cochlear Implant,” 2003) His use of the cochlear implant could potentially change the way he interacts with hearing teachers and peers. As the sound he hears becomes more and more meaningful to him, there may come a time where he doesn’t need an interpreter.

**Recommendations**

With this particular student, because he has had so many transitions in his life, Maslow's Hierarchy of Needs is most appropriate to apply while building a teaching plan. Due to moving so often in his high school years, the absence of his father and grandmother, and the feelings of isolation of mainstreamed deaf students, this student has needs for belongingness, love, and self-esteem.

Maslow points out that "belonging, love and self-esteem were essential and prerequisite human needs that have to be met before one could ever achieve a sense of self-worth." (Frame, 1996, pp. 13-22) This student needs to feel accepted, wanted, and appreciated by peers as well as the instructor. This can be achieved through group projects where the student has interaction with his peers and also is bringing valuable information to the group. Also, with class discussion and interaction you can build a sense of community that will provide an opportunity for friendships and positive encouragement for the student.

Another thing to be aware of in teaching deaf/hard of hearing students is that observational learning as described by Bandura doesn't occur with deaf students. Observational learning is learning through observing the behavior of others during classroom and social situations. In observational learning you both see and hear the activities and behaviors of the other students and teachers. Deaf children only see the activities and behaviors of others, but only if they have been directed visually to look at them. Almost all learning for the deaf student is directed learning. For example, a student talking to another student about information which creates a question for the class

which you address, the conversation between the two students, which was overheard by the rest of the class, was not heard by or interpreted to the deaf student. Therefore he doesn't understand the context of your answer unless you repeat the students' interchange for his benefit.

To help the student be the responsible learner he needs to be, you will need to modify your teaching style. And for the most part this means adding time for interaction with the student through his interpreter. For example, the student can't take notes from the board and watch an interpreter at the same time. If you want the student to take notes for himself, then you could write part of the information on the board and wait for him to copy it. When he has finished copying the information, you can lecture while pointing to the appropriate information on the board. Another option for note taking is to provide an outline for the student to take notes, but you would still need to wait while he is writing in information. Lastly, you could have another student be a note taker for him. The last two note taking options don't promote as much personal responsibility for his education as the first option. Also, when using an interpreter it is best if you do not turn your back on the student or interpreter. The interpreter needs to stand close to you with an unobstructed view of the student. This makes it easier to understand what you are saying. If you ask the student a question, you will have to wait for the interpreter to sign for you and then for the interpreter to voice the student's answer for him.

In conclusion, examining this "othered" student in light of Bronfenbrenner's Bio-Ecological Systems theory reveals all the influences on the student. By considering the student more holistically, rather than only what happens

exclusively in the present classroom, it would help the instructor develop a teaching plan for this student to maximize his learning potential. It might take a little research to fill in all the different systems needed to understand this student holistically but it would make the task of teaching this student easier. Understanding all the motivations and influences on a student can only help to make a more thoughtful plan of education. Since the previous recommendations take into consideration all the systems influencing this student, it can be reasonably expected that the student's performance will be successful at the college level if the recommendations are implemented. Consequently, the student becomes invested in his own academic success, as he then begins to see the correlation between that success and the quality of his future life.

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