

# Cochlear Implants, Psychopathology, and Psychosocial Functioning

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## Cochlear Implants

A cochlear implant is a hearing device that is surgically implanted and electronically stimulates nerves inside the inner ear to produce hearing sensations for a person with severe to profound deafness (U.S. Food and Drug Administration, n.d.). The primary components of a cochlear implant are an externally worn microphone that takes in auditory input, sound processor and transmitter system, and an implanted receiver and electrode system that receives signals from the external system and sends electrical currents to the inner ear to stimulate the nerves (U.S. Food and Drug Administration, n.d.).

## Origin of Psychopathology in Children With Cochlear Implants

The auditory input provided by a cochlear implant improves the speech perception and spoken language skills of children who are Deaf and Hard of Hearing (DHH), especially when implantation occurs at an early age. Many children with cochlear implants (CWCI) are able to perceive and produce spoken language well enough to attend mainstream schools and interact using spoken language with hearing peers, family, and strangers. However, even with speech and language habilitation, many CWCI still experience delays in language development (Freeman et al., 2017). CWCI were found to have significantly poorer speech intelligibility compared to peers with typical hearing (Ashori, 2020).

When speech intelligibility is less than optimal, other areas of development, daily living, and social functioning, may be affected. This is because speech intelligibility influences how peers and teachers view the personalities, abilities, and intelligence of children with hearing loss. Typically hearing peers' attitudes about CWCI personal qualities were closely related to CWCI speech intelligibility: as intelligibility improved, so did peers' attitudes (Freeman et al., 2017).

These findings establish the importance of speech intelligibility as an important link between linguistic and psychosocial abilities. If a child's speech intelligibility is difficult to understand, peers may avoid social contact, and with less social interaction, the child has fewer opportunities to learn appropriate social behaviors. In addition, because verbal communication is essential to friendship and peer interactions, poorly intelligible CWCI with few friends or poor-quality social interactions may become lonely and experience other

negative emotions, known as psychopathology, that may impact psychological development (Freeman et al., 2017).

## Psychopathology

Psychopathology refers to a broad spectrum of mental disorders (Theunissen et al., 2015). These researchers found that symptoms of psychopathology during childhood can be divided into two categories: internalizing and externalizing symptoms. Internalizing symptoms are composed of depressive and anxious feelings, while externalizing symptoms refer to hyperactive, aggressive, and antisocial behavior.

Better communication skills, better language skills, lower age at detection, lower age at intervention, and higher socio-economic status were significantly related to lower levels of internalizing symptoms. For externalizing symptoms, only communication skills contributed significantly (Theunissen et al., 2015).

CWCI are shown to have similar levels of psychopathological symptoms when compared to children with typical hearing (Theunissen et al., 2015). Although CWCI and children with typical hearing have similar levels of psychopathological symptoms, they differ in the source of the symptoms. As discussed previously, the source of symptoms for CWCI is poor speech intelligibility, which can impact psychosocial functioning.

## Relationship Between Psychosocial Functioning and Speech Intelligibility in CWCI

The relationship between psychosocial functioning and speech intelligibility in CWCI as compared to children with typical hearing is mixed.

- Social competence: Despite documented gains in oral language in CWCI, deficits in social competence remained after several years of implant use (Hoffman et al., 2016).
- Socialization and social integration: CWCI made significant progress over time and achieved age-appropriate social development (Bat-Chava, Martin, & Kosciw, 2005).
- Social skills and self-esteem: CWCI who were mainstreamed for more than half of the day reported having hearing friends. More than 75% reported good spoken language skills enabled them to participate more fully in all aspects of their lives (Moog et al., 2011).

The following research focused on the general population of DHH children and children who wear hearing aids, but the sentiments can be generalized to CWCI.

- Social adjustment and self-image: Students with higher degrees of speech intelligibility were better adjusted than those with lower degrees of speech intelligibility. The positive feedback from teachers and peers may result in a positive self-image because the DHH student may feel like part of a larger social network (Polat, 2003).
- Social functioning: Parents of DHH children reported lower social functioning and more behavioral problems. Higher communicative abilities were related to better social functioning and less behavioral problems (Netten et al., 2015).

## Tips for Teachers and Peers for Improving Inclusion and Psychosocial Functioning

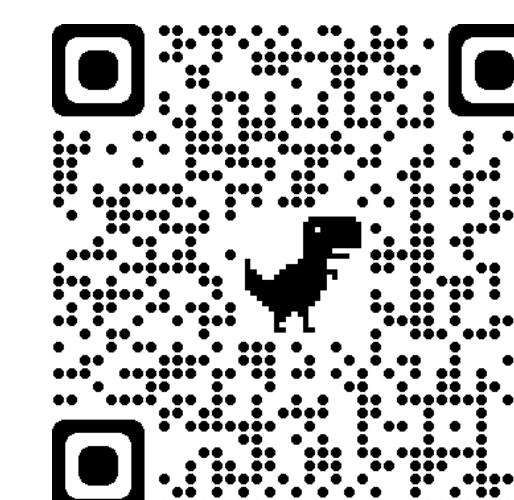
Teachers:

- Be prepared to troubleshoot and care for the cochlear implant.
- Reduce background noise in the classroom by carpeting the floor, padding the walls, and hanging drapes over the windows.
- Encourage positive peer interactions using a buddy system for group work that pairs CWCI with peers with typical hearing.

Peers:

- Be in-the-know about cochlear implants. Don't be shy to ask questions and learn more.
- Make eye contact with your peer during conversation so that they know you are talking to them and can see your lips as you speak.
- Check in with your peer about how they are feeling. Cheer them up with a funny joke if they need it!

For an expanded version of this chart, including more tips, scan this QR code:



## References

