



NSF supported Science of Learning Center on Visual Language and Visual Learning, SBE-1041725.

VISUAL LANGUAGE & VISUAL LEARNING RESEARCH BRIEF:



THE IMPLICATIONS OF BIMODAL BILINGUAL APPROACHES FOR CHILDREN WITH COCHLEAR IMPLANTS 双峰双语方法对植入人工 耳蜗的儿童的影响

Photo by the Laurent Clerc National Deaf Education Center/Gallaudet University

2012年6月份

从研究中学习

6

主要发现:

Key Findings:

- 对于植入人工耳蜗的聋儿童，视觉语言，如美国手语（ASL），可以对孩子的语言，沟通，认知，学术，识字和心理社交发展提供有利条件。
- 神经科学的研究证实，大脑有能力同时学习视觉语言和口语。此外，同时学习视觉语言和口语不会损害任何一种语言的发展。
- 早期开发视觉语言的能力可以有效地促进儿童的口语发展。
- 双峰双语式语言和沟通的方法，解决了视觉语言和口语的习得和使用，有可能通过孩子的视觉促进早期的语言，同时也可能通植入人工耳蜗刺激孩子的听力。
- 与聋人社群的互动对聋儿童或青少年的身份认证和社会情绪发展有帮助的。
- 系统化个别性计划，双峰双语教育能够提供一个丰富的口语环境。

作者:

Julie Mitchiner
PhD Candidate

Debra Berlin Nussbaum
MA, CCC-A

Susanne Scott
MS, CCC-A

儿童佩戴植入人工耳蜗获得的视觉语言的优势

Advantages of Visual Language for Children with Cochlear Implants

对神经科学研究的回顾表明，大脑有能力同时获得视觉语言和口语而不损害任何一种语言的发展。^{1,2,3} 此外，没有证据表明视觉语言抑制长期的口语成果。^{4,5,6,7} 有越来越多的证据表明，早期掌握视觉语言的能力可以有效地支持和促进孩子的口语发展。^{9,10,11,12,13} 此外，大量的研究记录了，对于植入人工耳蜗的儿童和青少年，从视觉语言在语言，沟通，认知，学术，识字，社会心理发展上的优势。^{9, 13,14,15,16,17,18,19}

本研究简报概述了，对于植入人工耳蜗的年轻聋学生，视觉语言及其优势的主要发现。此外，本简报讨论了双峰双语教育对于年轻聋学生的影响。双峰双语教育促进了自然手语和口语的发展和使用的。^{20, 21,22,23,24} 这种做法是“添加剂”，意味着它建立在孩子有一种语言的实力的基础上，同时也解决了第二语言的发展和使用的。²⁵ 换句话说，在植入人工耳蜗之前，一个聋儿童主要是通过视觉方式接触语言。双峰双语教育有助于孩子的视觉语言的发展和使用的，同时加入了口语的开发和使用的。^{26,27,28,29,30,31,32,33,34,35}

为什么家长和教育工作者要了解更多关于视觉语言，及它对植入人工耳蜗的聋学生在语言和沟通发展中的作用，这是很重要吗？

家长和教育工作者了解更多关于视觉语言，及它对植入人工耳蜗的聋学生在语言及沟通发展上的作用，其中一个显著和重要的原因是，研究表明，许多植入的聋儿童没有专为学习和沟通发展而使用的口语能力。发展口语的困难是因为有许

多相互关联的因素，具体到孩子，家庭，和人工耳蜗植入技术本身。

由于对所有耳聋和重听的儿童，口语的结果是不可预知的，如果没有尽早使用可接触的视觉语言，就存在着语言发育迟缓的风险。^{24,36,37,38,39,52}

这种风险也适用于一些儿童，他们在植入前没有很好地接触口语，或他们在植入后刚刚开始发展口语技能，或他们因为任何原因没有在植入后开发口语能力。¹⁷

视觉语言也有利于那些在典型的语言学习年龄后植入的儿童。植入人工耳蜗的儿童的皮质发育研究表明，中枢听觉系统的可塑性在 3 岁半后开始下降，使他们更难学会口语。此外，有证据表明，7 岁后，聋儿童的听觉系统开始进行重组，在这个时间后植入对口语的发展不再是最佳的。^{40, 41} 这更需要那些儿童有熟练的视觉语言以便交流和学习。

双峰双语教学的证据

The Evidence for a Bimodal Bilingual Approach

证据的审查表明，使用视觉语言没有明显的坏处，对植入人工耳蜗的儿童使用双峰双语教学，有许多附加的好处。

关于早期视觉语言的优势：

- 对于所有聋和重听儿童，包括植入人工耳蜗的儿童，有大量的证据记录了早期视觉语言在语言上的优势。⁴²
- 有越来越多的证据表明，不管孩子的听力

状况如何，早期接触双语，视觉语言和口语，可以以有利的方式改变大脑的神经回路；这些变化积极影响语言和其他更高级的认知能力。⁴³

- 有证据显示，使用视觉语言以及与视觉语言的母语使用者互动，有利于使用人工耳蜗的儿童和青少年的身份认同和社交情感的发展。⁴⁴ 根据早期视觉语言的优势的记录，双峰双语教学——它包括了哲学，信仰和实践，以促进开发和使用视觉语言和口语——大力支持植入人工耳蜗的儿童应用。

聋教育中双语实践的历史的简要回顾，将有助于了解双峰双语的背景。在 20 世纪 80 年代，聋教育的教师和语言专家开始发展双语实践来教育聋学生。这些双语实践解决了聋学生的需求，特别是在语言的可及性和文化，认同发展方面。这些实践被称为双语 - 双文化（“双-双”）的教法。在美国的双-双教法中，视觉语言-ASL-发展晋升为第一语言，并作为指导和沟通的媒介；英语习得是主要通过阅读和写作来学习。^{45, 46, 47, 48} 最近，双语教育者包含了英语口语的发展，以适合和符合孩子的口语/听力发展。^{46, 49} 现在，越来越多的聋儿童通过数码助听器和人工耳蜗植入接触口语，许多双语教育计划已经纳入了额外的策略和机会，以便让儿童开发和使用口语。这类双语教法，可以在上学的特定时间提供听觉接触，被称为**双峰双语教法**。

双峰双语对植入人工耳蜗的儿童和青少年的优势

The Bimodal Bilingual Advantage for Children and Adolescents with Cochlear Implants

双峰双语教法对植入人工耳蜗的儿童和青少年有许多好处。相比于单语/口语的方法，这种方法有以下优势：

- 对植入人工耳蜗的儿童，提供被证实的双语的好处（例如，沟通和认知的灵活性，增强的语言意识和解决问题能力，以及更多的文化接触和知识）。^{25, 44}
- 提供一个两种语言相互依存的环境，学习一种语言有助于另一种语言的学习。^{10, 50}
- 促进语言能力，而不损害认知能力的发展，及学校的学习和社交情感的成长。⁵¹
- 维护语言的习得和通过聋儿童的完整的视觉方式学习语言，同时刺激，使用和评估口语。在孩子的语言发展关键时期，这种保护尤其重要。^{36, 37, 38, 39, 52}
- 在两种语言中，扩大早期词汇扩展^{38, 53, 54, 55}和音位发展的机会^{56, 57}（已发现对读写能力的发展产生积极的影响）。
- 在视觉语言和口语中，提供语言基础，以便聋学生除了在学术环境中学习方式的选择，在社交中也有沟通方式的选择。^{49, 58}
- 提供一个环境，让学生可以与聋社区的成员互动。与那些视觉语言的使用者，和那些有共同经验，信念和价值观的人互动，⁵⁹有益于聋儿童和青少年的身份认同和社会情感的发展。^{15, 18, 19, 51, 60, 61, 62, 63, 64, 65, 66, 92}
- 促进视觉语言和口语的能力，为孩子和他

或她的家庭成员之间直接和方便的沟通，提供了更多的机会。这已被证明可以提高孩子的自我认识以及整体的生活质量。⁶⁷ 提供可接触的语言和沟通，以便，当他或她的口语能力有限时，或无法使用人工耳蜗或助听器时，或在一个具有挑战性的听力环境中时（如设备故障的情况），或与没有人工耳蜗的聋同伴互动时，孩子可以选择沟通的方式。^{5, 17}

教法，家庭和职业教育应包括：

- 对植入人工耳蜗的儿童的整体发展，进行研究并记录视觉语言的优势。
- 语言学和神经科学的研究，它表明双语不会引起语言迟缓或混乱。⁸⁶
- 如何有效地设计这种教法以促进口语发展的具体战略。^{4, 14, 69, 83, 87}
- 研究讨论典型的双峰双语发展的顺序。给予一个完全可触及的语言环境，ASL 和英语口语有同样的发展里程碑。⁹⁴
- 讨论以下作法的价值：促进孩子从一开始就使用视觉语言和口语，而不是只有当口语无法发展时，才加入视觉语言。^{17, 24}

家庭和专业教育的参与

Implications for Family and Professional Education

虽然许多听力正常的家庭，为植入人工耳蜗的孩子，使用某种形式的手语，但手语通常被他们视为通往口语的桥梁，或对口语的支持。很少有家庭和专业人士意识到充分接触视觉语言的意义和好处。^{4, 15, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81} 有证据表明，

适当的教育，使听力正常家庭接受，并学习到视觉语言的好处及与聋社区和文化互动的价值。

^{15, 16, 17, 66, 80, 82, 83}

有越来越多的聋家庭为他们的孩子选择人工耳蜗植入。许多这些家庭声明，他们孩子的目标是除了英语口语能力，还拥有流利的 ASL 和书面英语能力。他们的目的是，让他们的孩子用视觉语言和口语发展社交和学术水平，以及让他或她有机会参与聋和听力正常社区的活动。^{83, 84, 85, 93} 在聋社区内，作为一种工具，有越来越多的人接受了人工耳蜗植入技术，其中几分之一是聋儿童。聋社区的一些成员继续对人工耳蜗植入表示忧虑，特别是对儿童植入。^{61, 92}

为了促进越来越多地认识双语，和支持双峰双语

双峰双语的规划和实施

Bimodal Bilingual Planning and Implementation

每个孩子成为双语的途径都是独一无二的；因此，系统地个性化地规划和监测每种语言的开发和使用，是实施双峰双语教学的中心。⁸⁸ 使用个性化的规划，量身定制视觉语言和口语的使用，以反映儿童在植入前和植入后的各种特点。这种规划过程可以应用于具有不同人口学特征的儿童，包括那些有额外残疾的，那些在语言发育早期获得人工耳蜗植入的，以及那些在早期语言发展年龄之后的青少年时期获得植入的。^{49, 58} 规划和实施包括，发展孩子的个性化资料和评估然后用于指导学习活动，如何和何时在课堂上和家里使用每一种语言，以及提供建议给支持服务。

^{49, 58, 88}

当设计双峰双语教学以解决口语和视觉语言的发展和使用时，重要的是，孩子的环境要包括以证据为基础的与每种语言不可分割的策略和技巧。对于口语，这包括一种环境，促使人工耳蜗植入设备的连续使用，促使丰富的口语模型的提供，促使口语的连续进步和使用，以及存在知道策略和技术的专业人士和家庭，以协助口语的发展和使用的。^{13, 35, 70, 74, 78, 89, 90} 同样对于视觉语言，提供一个环境，其中包括丰富的视觉语言模型，以及知道策略和技术的专业人士和家庭，以协助视觉语言的发展和使用的，这是非常重要的。^{44, 49, 88}

人工耳蜗植入研究的几个问题

Issues in Cochlear Implant Research

在研究和写这篇简报时，当作者回顾关于植入人工耳蜗的儿童使用视觉语言的文献时，几个问题出现在他们的脑海中。早期语言的习得和人工耳蜗植入的研究是临床性的，主要涉及语音感知和言语发音技能的发展。本研究往往不能反映语言发展的所有方面。⁹¹

此外，在文献中讨论时，很少定义“手语”，通常没有讨论手语使用的数量和质量。当研究包含手语的教学时，一般在综合沟通的设定上。这些设定的研究人员经常把手语作为口语的支持来探讨它的使用。这篇简报的作者没有发现对于开发和完整的视觉语言和口语的纵向研究。此外，作者发现，许多研究人员没有考虑到语言模式的复杂性，以及模式如何与众多因素互动在各种领域影响口语的成果和人工耳蜗植入结果，例如在社会心理发展，文化，和学业成就领域。^{53, 90} 在模式的使用（视觉相对于听觉）如何相关生活质量上，人们也是有限地关注人工耳蜗植入者的

观点。¹⁰

进一步的研究

Further Research

研究是需要的，它不仅仅把口语成果作为衡量一个植入人工耳蜗的儿童成功的标准，并且探讨：

- 早期视觉语言习得的影响，和早期植入儿童在语言，认知，社会情感和学术的发展。
- 后期植入的儿童和青少年的视觉语言的使用，对语言，认知，社会情感和学术发展的影响。
- 受口语教育的植入儿童和使用 ASL /英语双峰双语教法的儿童的纵向结果的比较。
- 在双峰双语计划中，促进植入儿童视觉语言和口语发展的有效练习。
- 对于人工耳蜗使用，双峰双语发展和生活质量，家庭和儿童/青少年的观点。

把 VL2 的研究转化为实践

Translating VL2 Research to Practice

国家科学基金资助的视觉语言和视觉学习中心（VL2）（The National Science Foundation-funded Science of Learning Center on Visual Language and Visual Learning (VL2)发布研究简报，作为教育工作者和家长的资源。我们的目标是，告知教育社区研究结果，总结相关的知识，并提供建议给教

育工作者和家长，以便他们可以解决在教育耳聋和重听孩子时面临的多方挑战。

这个简报中所提供的信息，试图解释双峰双语教法对植入人工耳蜗或戴助听器的年轻聋儿童的优势。

研究简报在 v12.gallaudet.edu 可看到。

这项研究简报，是 Laurent Clerc 国家聋教育中心和 VL2 中心共同资助的。

This research brief is co-sponsored by the Laurent Clerc National Deaf Education Center and the VL2 Center.

欲了解更多关于视觉语言和人工耳蜗植入的信息，请看 Clerc 中心人工耳蜗植入教育中心的网页：

www.gallaudet.edu/Clerc_Center/Information_and_Resources/Cochlear_Implant_Education_Center.html。

VL2 中心的目标宣言

VL2 Center Mission Statement

该中心的主要使命是，通过理解行为和大脑的机制来促进学习，这个机制就是学习主要通过视力和视觉过程，同时我们的科学问题被令人兴奋的平衡所激励和告知，这种平衡是在科学的进步和问题和学习和社会环境的进步和问题之间。我们的使命是，使用双向发现模型建立一个学习的科学，其中医生和科学家可以自由地相互交流思想，识别教育和社会实践的核心问题，通过行为和大脑的科学知识这一科学将从根本上进步。这使命涉及两个总体互补的团体的进步。

Clerc 中心的目标宣言

Clerc Center Mission Statement

Clerc 中心，一个由联邦政府资助的国家聋哑教育中心，确保全国不同族裔的耳聋和重听学生（从出生到 21 岁）拥有受教育的权力，并且拥有语言能力作为生产和贡献的社会成员去最大限度地发挥潜力。这可以通过语言的早期接触和获得，教学的卓越，家庭的参与，研究，最佳实践的识别和实施，合作，以及全国学校和课程之间的信息分享来实现。

本研究简报的发展，部分由联邦经费资助。这项工作的发表，并不意味着美国教育部批准或接受这里的调查结果，结论或建议。Gallaudet 大学是一个机会均等的雇主/教育机构，没有基于种族，肤色，性别，国籍，宗教，年龄，听力状况，残疾，退伍军人身份，婚姻状况，个人外表，性取向，家庭责任，预科，政治派别，收入来源，营业或居住的地方，怀孕，分娩的歧视，或其他任何非法基础的歧视。

参考文献

References

1. Kovelman, I., Shalinsky, M. H., White, K. S., Schmitt, S. N., Berens, M. S., Paymer, N., et al. (2009). Dual language use in sign-speech bimodal bilinguals: fNIRS brain-imaging evidence. *Brain & Language, 109*, 112-123. doi: 10.1016/j.bandl.2008.09.008
2. Petitto, L. A., Katerelos, M., Levy, B. G., Gauna, K., Tetreault, K., & Ferraro, V. (2001). Bilingual signed and spoken language acquisition from birth: Implications for the mechanisms underlying early bilingual language acquisition. *Journal of Child Language, 28*, 453-496.
3. Petitto, L. A., & Kovelman, I. (2003). The

- bilingual paradox: How signing-speaking bilingual children help us resolve bilingual issues and teach us about the brain mechanisms underlying all language acquisition. *Learning Languages*, 8(3), 5-18.
4. Archbold, S., Sach, T., O'Neill, C., Lutman, M., & Gregory, S. (2008). Outcomes from cochlear implantation for child and family: Parental perspectives. *Deafness and Education International*, 10(3), 120-142. doi:10.1002/dei.243
 5. Giezen, M. R. (2011). *Speech and sign perception in deaf children with cochlear implants* (Doctoral dissertation, Universiteit van Amsterdam, Amsterdam, Netherlands, 2011). Retrieved from <http://dare.uva.nl/en/record/374190>
 6. Marschark, M., & Hauser, P. C. (2012). *How deaf children learn: What parents and teachers need to know*. New York: Oxford University Press, Inc.
 7. Marschark, M., Schick, B., & Spencer, P. E. (2006). Understanding sign language development of deaf children. In B. Schick, M. Marschark, & P. E. Spencer (Eds.), *Advances in the sign language development of deaf children* (pp. 3-19). New York: Oxford University Press.
 8. Spencer, P. E. (2009, April). *Research to practice*. Presented at Cochlear Implants and Sign Language: Building Foundations for Effective Educational Practices, Laurent Clerc National Deaf Education Center, Gallaudet University, Washington, DC.
 9. Jimenez, M. S., Pino, M. J., & Herruzo, J. (2009). A comparative study of speech development between deaf children with cochlear implants who have been educated with spoken or spoken + sign language. *International Journal of Pediatric Otorhinolaryngology*, 73(1), 109-114. doi:10.1016/j.ijporl.2008.10.007
 10. Preisler, G., Tvingstedt, A. L., & Ahlström, M. (2005). Interviews with deaf children about their experiences using cochlear implants. *American Annals of the Deaf*, 150(3), 260-267.
 11. Seal, B. C., Nussbaum, D. B., Belzner, K. A., Scott, S., & Waddy-Smith, B. (2011). Consonant and sign phoneme acquisition in signing children following cochlear implantation. *Cochlear Implants International*, 12 (1), 34-43.
 12. Tait, M., Lutman, M. E., & Robinson, K. (2000). Preimplant measures of preverbal communicative behavior as predictors of cochlear implant outcomes in children. *Ear & Hearing*, 21(1), 18-24.
 13. Yoshinaga-Itano, C. (2006). Early identification, communication modality, and the development of speech and spoken language skills: Patterns and considerations. In P. E. Spencer & M. Marschark (Eds.), *Advances in the spoken language development of deaf and hard-of-hearing children* (pp. 298-327). New York: Oxford University Press.
 14. Bat-Chava, Y., & Deignan, E. (2001). Peer relationship of children with cochlear implants. *Journal of Deaf Studies and Deaf Education*, 6(3), 186-199. doi: 10.1093/deafed/6.3.186
 15. Christiansen, J. B., & Leigh, I. W. (2004). Children with cochlear implants: Changing parent and deaf community perspectives. *Archives of Otolaryngology- Head and Neck Surgery*, 130(5), 673-677.
 16. Hyde, M., & Punch, R. (2011). The modes of communication used by children with cochlear implants and the role of sign in their lives. *American Annals of the Deaf*, 155(5), 535-549.
 17. Kermit, P. (2010). Choosing for the child with cochlear implants: A note of precaution. *Medicine, Health Care, and Philosophy*, 13(2), 157. doi:10.1007/s11019-010-9232-2
 18. Most, T., Wiesel, T., & Blitzer, T. (2007). Identity and attitudes towards cochlear implants among deaf and hard of hearing adolescents. *Deafness Education International*, 9(2), 68-82. doi:10.1002/dei.100
 19. Preisler, G., Tvingstedt, A. L., & Ahlström, M. (2005). Psychosocial follow-up study of deaf preschool children using cochlear implants. *Child: Care, Health & Development*, 28(5), 403-418. doi:10.1111/j.1365-2214.2005.00291.x
 20. Berent, G. (2004). Spoken language-spoken language bilingualism: Code mixing and code mixing by American English bilinguals. In W. C.

- Ritchie & T. K. Bhatia (Eds.), *The handbook of bilingualism* (pp. 312-335). Malden, MA: Blackwell.
21. Bishop, M. (2006). *Bimodal bilingualism in hearing, native users of American Sign Language* (Doctoral dissertation, Gallaudet University). Available from ProQuest Dissertations and Theses Database. (UMI No. 3337513)
22. Emmorey, K., Bornstein, H. B., & Thompson, R. (2005). Bimodal bilingualism: Code-blending between spoken English and American Sign Language. In J. Cohen, K. T. McAlister, K. Rolstad, & J. MacSwan (Eds.), *ISB4: Proceedings of the 4th International Symposium on Bilingualism* (pp. 663-673). Somerville, MA: Cascadilla Press.
23. Emmorey, K., & McCullough, S. (2009). The bimodal bilingual brain: Effects of sign language experience. *Brain and Language*, *109*, 124-132. doi: 10.1016/j.bandl/2008.03.005
24. Humphries, T., Kushalnagar, P., Mathur, G., Napoki, D. J., Padden, C., Rathmann, C., et al. (2012). Language acquisition for deaf children: Reducing the harms of zero tolerance to the use of alternative approaches. *Harm Reduction Journal*, *9*(16). doi:10.1186/1477-7517-9-16
25. Baker, C. (2006). *Foundations of bilingual education and bilingualism* (4th edition). Clevedon, England: Multilingual Matters.
26. Belzner, K. A., & Seal, B. C. (2009). Children with cochlear implants: A review of demographics and communication outcomes. *American Annals of the Deaf*, *154*(3), 311-333.
27. Fagan, M. K., Pisoni, D. B., Horn, D. L., & Dillon, C. M. (2007). Neuropsychological correlates of vocabulary, reading, and working memory in deaf children with cochlear implants. *Journal of Deaf Studies and Deaf Education*, *12*(4), 461-471. doi: 10.1093/deafed/enm023
28. Hawker, K., Ramirez-Inscoe, J., Bishop, D. V., Twomey, T., O'Donoghue, G. M., & Moore, D. R. (2008). Disproportionate language impairment in children using cochlear implants. *Ear & Hearing*, *29*(3), 467-471.
29. Inscoe, J. R., Odell, A., Archbold, S., & Nikolopoulos, T. (2009). Expressive spoken language development in deaf children with cochlear implants who are beginning formal education. *Deafness and Education International*, *11*(1), 39-55. doi:10.1002/dei.252
30. Nicholas, J. G., & Geers, A. E. (2007). Will they catch up? The role of age at cochlear implantation in the spoken language development of children with severe to profound hearing loss. *Journal of Speech, Language, and Hearing Research*, *50*(4), 1048-1062. doi:10.1044/1092-4388(2007/073)
31. Pisoni, D. B., Conway, C. M., Kronenberger, W. G., Horn, D. L., Karpicke, J., & Hennings, S. C. (2008). Efficacy and effectiveness of cochlear implants in deaf children. In M. Marschark & P. C. Hauser (Eds.), *Deaf cognition: Foundations and outcomes* (pp. 52-101). New York: Oxford University Press.
32. Robbins, A. M., Koch, D. B., Osberger, M. J., Zimmerman-Phillips, S., & Kishon-Rabin, L. (2004). Effect of age at cochlear implantation on auditory skill development in infants and toddlers. *Archives of Otolaryngology—Head Neck Surgery*, *130*, 570-574.
33. Sarant, J. Z., Holt, C. M., Dowell, R. C., Rickards, F. W., & Blamey, P. J. (2009). Spoken language development in oral preschool children with permanent childhood deafness. *Journal of Deaf Studies and Deaf Education*, *14*(2), 205-217. doi:10.1093/deafed/enn034
34. Spencer, P. E. (2004). Individual differences in language performance after cochlear implantation at one to three years of age: Child, family, and linguistic factors. *Journal of Deaf Studies and Deaf Education*, *9*(4), 395-412. doi:10.1093/deafed/enh033
35. Wie, O. B., Falkenberg, E. S., Tvete, O., & Tomblin, B. (2007). Children with a cochlear implant: Characteristics and determinants of speech recognition, speech-recognition growth rate, and speech production. *International Journal of Audiology*, *46*(5), 232-243. doi: 10.1080/14992020601182891
36. Mayberry, R. I. (1993). First-language acquisition after childhood differs from second-language acquisition: The case of American Sign Language. *Journal of Speech, Language, and*

Hearing Research, 36(6), 1258-1270.

37. Mayberry, R. I., & Eichen, E. B. (1991). The long-lasting advantage of learning sign language in childhood: Another look at the critical period for language acquisition. *Journal of Memory and Language*, 30(4), 486-512. doi:10.1016/0749-596X(91)90018-F
38. Mayberry, R. I., Lock, E., & Kazmi, H. (2002). Linguistic ability and early language exposure. *Nature*, 417(6884), 38. doi:10.1038/417038a
39. Schick, B., de Villiers, J., de Villiers, P., & Hoffmeister, R. (2007). Language and theory of mind: A study of deaf children. *Child Development*, 78(2), 376-396.
40. Sharma, A., & Dorman, M. F. (2006). Central auditory development in children with cochlear implants: Clinical implications. *Advances in Otorhinolaryngology*, 64, 66-88.
41. Sharma, A., Dorman, M. F., & Kral, A. (2005). The influence of a sensitive period on central auditory development in children with unilateral and bilateral cochlear implants. *Hearing Research*, 203, 134-143.
42. Visual Language and Visual Learning Science of Learning Center. (2011, January). *Advantages of early visual language* (Research Brief No. 2). Washington, DC: Sharon Baker.
43. Petitto, L. A. (2009). New discoveries from the bilingual brain and mind across the lifespan: Implications for education. *International Journal of Mind, Brain and Education*, 3(4), 185-197.
44. Swanwick, R., & Tsverik, I. (2007). The role of sign language for deaf children with cochlear implants: Good practice in sign bilingual settings. *Deafness and Education International*, 9(4), 214-231. doi:10.1002/dei.226
45. Nover, S. (1995). Politics and language: American Sign Language and English in deaf education. In C. Lucas (Ed.), *Sociolinguistics in deaf communities* (pp. 109-163). Washington, DC: Gallaudet University Press.
46. Nover, S. M., Christensen, K. M., & Cheng, L. L. (1998). Development of ASL and English competence for learners who are deaf. *Topics in Language Disorders*, 18(4), 61-72.
47. Reynolds, D. O., & Titus, A. M. (1991). Bilingual/bicultural education: Constructing a model for change. In S. Polowe-Aldersley, P. Schragle, V. Armour, & J. Polowe (Eds.), *Proceedings of the New Orleans 1991 CAID/CEASD Convention* (pp. 127-133). Silver Spring, MD: The Convention.
48. Vernon, M., & Daigle, B. (1994). Bilingual and bicultural education. *Deaf American Monograph*, 44, 121-126.
49. Garate, M. (2011). Educating children with cochlear implants in an ASL/English bilingual classroom. In R. Paludneviene & I. Leigh (Eds.), *Cochlear implants: Evolving perspectives* (pp.206-228). Washington, DC: Gallaudet University Press.
50. Cummins, J. (2006, October). *The relationship between American Sign Language proficiency and English academic development: A review of the research*. Paper presented at the conference of Challenges, Opportunities, and Choices in Educating Minority Group Students, Norway. Retrieved from http://www.gallaudet.edu/documents/cummins_sl-eng.pdf
51. Grosjean, F. (2008). *Studying bilinguals*. Oxford, UK: Oxford University Press.
52. Mayberry, R. I. (2007). When timing is everything: Age of first-language acquisition effects on second-language learning. *Applied Psycholinguistics*, 28(3), 537-549. doi:10.1017/S0142716407070294
53. Connor, C. M., Hieber, S., Arts, H. A., & Zwolan, T. A. (2000). Speech, vocabulary, and the education of children using cochlear implants: Oral or total communication? *Journal of Speech, Language, and Hearing Research*, 43(5), 1185-1204.
54. Connor, C. M., & Zwolan, T. A. (2004). Examining multiple sources of influence on the reading comprehension skills of children who use cochlear implants. *Journal of Speech, Language, and Hearing Research* 47, 509-526.
55. Vermeulen, A., van Bon, W., Schreuder, R., Knoors, H., & Snik, A. (2007). Reading comprehension of deaf children with cochlear implants. *Journal of Deaf Studies and Deaf Education* 12(3), 283-302.

doi:10.1093/deafed/enm017

56. Goldin-Meadow, S., & Mayberry, R. I. (2001). How do profoundly deaf children learn to read? *Learning Disabilities Research & Practice, 16*(4), 222-229.
57. Petitto, L. A. (2000). On the biological foundations of human language. In K. Emmorey & H. Lane (Eds.), *The signs of language revisited: An anthology in honor of Ursula Bellugi and Edward Klima* (pp. 447-471). Mahway, NJ: Lawrence Erlbaum Associates, Inc.
58. Nussbaum, D. B., & Scott, S. M. (2011). The Cochlear Implant Education Center: Perspectives on effective educational practices. In R. Paludneviene & I. W. Leigh (Eds.), *Cochlear implants: Evolving perspectives* (pp. 175-205). Washington, DC: Gallaudet University Press.
59. Ladd, P. (2003). *Understanding deaf culture: In search of deafhood*. Tonawanda, NY: Multilingual Matters.
60. Archbold, S., & Wheeler, A. (2010). Cochlear implants: Family and young people's perspectives. In M. Marschark & P. Spencer (Eds.), *Oxford handbook of deaf studies, language, and education* (Vol. 2, pp. 226-240). New York: Oxford University Press.
61. Paludneviene, R., & Harris, R. L. (2011). Impact of cochlear implants on the deaf community. In R. Paludneviene & I. Leigh (Eds.), *Cochlear implants: Evolving perspectives* (pp. 3-19). Washington, DC: Gallaudet University Press.
62. Leigh, I. W., & Maxwell-McCaw, D. (2011). Cochlear implants: Implications for deaf identities. In R. Paludneviene & I. W. Leigh (Eds.), *Cochlear implants: Evolving perspectives* (pp. 95-110). Washington, DC: Gallaudet University Press.
63. Swanwick, R., & Gregory, S. (2007). *Sign bilingual education: Policy and practice*. Coleford, UK: Douglas McLean Publishing.
64. Keating, E., & Mirus, G. (2003). Examining interactions across language modalities: Deaf children and hearing peers at school. *Anthropology and Education Quarterly, 34*(2), 115-135.
65. Wald, R. L., & Knutson, J. F. (2000). Deaf culture identity of adolescents with and without cochlear implants. *The Annals of Otology, Rhinology and Laryngology, 109* (12), 87-89.
66. Wheeler, A., Archbold, S., Gregory, S., & Skipp, A. (2007). Cochlear implants: The young people's perspective. *Journal of Deaf Studies and Deaf Education, 12*(3), 303-316. doi:10.1093/deafed/enm018
67. Kushalnagar, P., Topolski, T. D., Schick, B., Edwards, T. C., Skalicky, A. M., & Patrick, D. L. (2011). Mode of communication, perceived level of understanding and perceived quality of life in youth who are deaf or hard of hearing. *Journal of Deaf Studies and Deaf Education, 16*(4), 512-523. doi:10.1093/deafed/enr015
68. Archbold, S., & O'Donoghue. (2009). Education and childhood deafness: Changing choices and new challenges. In J. K. Niparko (Ed.), *Cochlear implants: Principles & practice*. (pp. 313- 345). Baltimore: Lippincott, Williams & Wilkins.
69. Archbold, S., Sach, T., O'Neill, C., Lutman, M., & Gregory, S. (2006). Deciding to have a cochlear implant and subsequent after-care: Parental perspectives. *Deafness and Education International, 8*(4), 190-206. doi: 10.1002/dei.20
70. Geers, A. E. (2006). Spoken language in children with cochlear implants. In P. E. Spencer & M. Marschark (Eds.), *Advances in the spoken language development of deaf and hard-of-hearing children* (pp. 244-270). New York: Oxford University Press.
71. Moeller, P. M. (2006). Use of sign with children who have cochlear implants: A diverse set of approaches. *Loud and Clear, 2*, 1 & 6-10.
72. Chute, P., & Nevins, M. E. (2006). *School professionals working with children with cochlear implants*. San Diego, CA: Plural Publishing, Inc.
73. Berg, A. L., Ip, S. C., Hurst, M., & Herb, A. (2007). Cochlear implants in young children: Informed consent as a process and current practices. *American Journal of Audiology, 16*(1), 13-28. doi:10.1044/1059-0889(2007/003)
74. Geers, A. E., Spehar, B., & Sedey, A. (2002). Use of speech by children from Total

- Communication programs who wear cochlear implants. *American Journal of Speech-Language Pathology*, 11(1), 50-58. doi:10.1044/1058-0360(2002/006)
75. Hammes, D. M., Novak, M. A., Rotz, L. A., Willis, M., Edmondson, D. M., & Thomas, J. F. (2002). Early identification and cochlear implantation: Critical factors for spoken language development. *The Annals of Otolaryngology, Rhinology and Laryngology*, 111, 74-78.
76. Huttunen, K., & Välimaa, T. (2010). Parents' views on changes in their child's communication and linguistic and socioemotional development after cochlear implantation. *Journal of Deaf Studies and Deaf Education*, 15(4), 383. doi:10.1093/deafed/enq029
77. Spencer, L. J., & Tomblin, J. B. (2006). Speech production and spoken language development of children using "Total Communication." In P. E. Spencer & M. Marschark (Eds.), *Advances in the spoken language development of deaf and hard of hearing children* (pp.166-192). New York: Oxford University Press.
78. Spencer, L. J., & Bass-Ringdahl, S. (2004). An evolution of communication modalities: Very young cochlear implant users who transitioned from sign to speech during the first years of use. *International Congress Series*, 1273, 352-355.
79. Watson, L. M., Archbold, S. M., & Nikolopoulos, T. P. (2006). Children's communication mode five years after cochlear implantation: Changes over time according to age at implant. *Cochlear Implants International*, 7(2), 77-91. doi:10.1002/cii.301
80. Watson, L. M., Hardie, T., Archbold, S. M., & Wheeler, A. (2008). Parents' views on changing communication after cochlear implantation. *Journal of Deaf Studies and Deaf Education*, 13(1), 104-116. doi:10.1093/deafed/enm036
81. Wheeler, A., Archbold, S. M., Hardie, T., & Watson, L. M. (2009). Children with cochlear implants: The communication journey. *Cochlear Implants International*, 10(1), 41-62.
82. Hyde, M., & Power, D. (2006). Some ethical dimensions of cochlear implantation for deaf children and their families. *Journal of Deaf Studies and Deaf Education*, 11(1), 102-111. doi:10.1093/deafed/enj009
83. Hyde, M., Punch, R., & Komesaroff, L. (2010). Coming to a decision about cochlear implantation: Parents making choices for their deaf children. *Journal of Deaf Studies and Deaf Education*, 15(2), 162-178. doi:10.1093/deafed/enq004
84. Mitchiner, J. C., & Sass-Lehrer, M. (2011). My child can have more choices: Reflections of deaf mothers on cochlear implants for their children. In R. Paludneviciene & I. W. Leigh (Eds.), *Cochlear implants: Evolving perspectives* (pp. 71-94). Washington, DC: Gallaudet University Press.
85. Mitchiner, J. (2012, May). *Deaf families with children who have cochlear implants: Beliefs & perspectives on bilingualism in American Sign Language & English*. Poster session presented at the 1st International Congress on Family-Centered Early Intervention for Children Who are Deaf and Hard of Hearing, Bad Ischl, Austria.
86. Petitto, L. A., & Holowka, S. (2002). Evaluating attributions of delay and confusion in young bilinguals: Special insights from infants acquiring a signed and spoken language. *Sign Language Studies*, 3(1), 4-33. doi: 10.1353/sls.2002.0025
87. Mayer, C., & Leigh, G. (2010). The changing context for sign-bilingual education program: Issues in language and the development of literacy. *International Journal of Bilingual Education and Bilingualism*, 13(2), 175-186.
88. Nussbaum, D. B., Scott, S., & Simms, L. E. (2012). The "why" and "how" of an ASL/English bimodal bilingual program. *Odyssey*, 13, 14-19.
89. Geers, A. E. (2002). Factors affecting the development of speech, language, and literacy in children with early cochlear implantation. *Language, Speech, and Hearing Services in Schools*, 33(3), 172-183. doi:10.1044/0161-1461(2002/015)
90. Marschark, M., Rhoten, C., & Fabich, M. (2007). Effects of cochlear implants on children's reading and academic achievement. *Journal of Deaf Studies and Deaf Education*,

12(3), 269-282. doi:10.1093/deafed/enm013

Proofreader: Catherine Valcourt-Pearce

91. Beadle, E. A. R., McKinley, D. J., Nikolopoulos, T. P., Brough, J., O'Donoghue, G. M., & Archbold, S. M. (2005). Long-term functional outcomes and academic-occupational status in implanted children after 10-14 years of cochlear implant use. *Otology & Neurotology*, 26(6), 1152-1160.
92. Christiansen, J. B., & Leigh, I. W. (2011). Cochlear implants and deaf community perceptions. In R. Paludneviene & I. W. Leigh (Eds.), *Cochlear implants: Evolving perspectives* (pp. 39-55). Washington, DC: Gallaudet University Press.
93. Nussbaum, D. B., & Mitchiner, J. (2012, May). *Cochlear implants: Where do visual language & deaf culture fit in?*. Poster session presented at the 12th International Conference on Cochlear Implants and Other Implantable Auditory Technologies, Baltimore, MD.
94. Andrews, J., Logan, R., Phelan, J. (2008, January). Milestones of language development for speech, hearing & ASL. *ADVANCE for Speech-Language Pathologists and Audiologists*, 18(2), 16. Retrieved January 15, 2010, from <http://www.advanceweb.com>.

这篇简报的出处

To cite this brief:

Visual Language and Visual Learning Science of Learning Center. (2012, June). *The Implications of Bimodal Bilingual Approaches for Children with Cochlear Implants* (Research Brief No. 6). Washington, DC: Julie Mitchiner, Debra Berlin Nussbaum, and Susanne Scott.

荣誉

Credits

Writers: Julie Mitchiner, PhD candidate; Debra Berlin Nussbaum, MA, CCC-A; & Susanne Scott, MS, CCC-A
Content developer and copyeditor: Kristen Harmon, PhD
Consultant: M. Diane Clark, PhD
Designer: Melissa Malzkuhn, MA
Research assistant: Erica Wilkins

