

## **How Audio Learning Can Increase Your Child's IQ**

## Executive Summary

The following white paper analyzes the relationship between IQ and intelligence and examines how the use of various audio learning tools, especially audiobooks, can aid in the process of intellectual growth. The main sections of the paper are as follow:

- What is IQ?
  - Can IQ be improved?
  - Relationship between IQ and intelligence
  - Interconnectedness of different elements of intelligence
  - How audio learning relates to these elements
  - Audiobooks for learning
  - Examples of improvement in practice
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## Helping Children Reach Their Full Potential

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*“It is a miracle that curiosity survives formal education.”*

*- Albert Einstein*

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When parents think about what is best for their children, helping them reach their full mental potential often is fairly high on the list of priorities.

So, what things can parents do to help their children harness the full capacity of their gifting? If parents only provide for their children the *standard* course of institutionalized schooling, the children can certainly learn and grow, but likely not to the fullest extent possible. In order to reach that level, parents will need to explore additional means and methods that allow their children to develop their minds in more effective and expansive ways.

Once parents commit themselves to identifying those more effective tools, they will soon find them to be various and diverse. The one that we propose to examine in this study, however, is that of audio learning tools. How might audio resources help children grow and develop their minds? Especially, how might these audio tools help children improve their overall IQ?

## What Is IQ?

## IQ Scoring System

The Intelligence Quotient, or IQ, is an individual's measured level of intellectual advancement is compared to the intellectual advancement of others in his age category. The individual's relative advancement is expressed on a numerical scale. Average performance is expressed by a score in the range of 90 to 110; a score of 130 or greater is usually considered to be gifted, and various other subranges of scores are often identified.

## IQ Test Structure

More significant than the IQ scoring system, however, is the matter of the testing process used to gauge intelligence. How does an IQ test work?

To start with, there is no one single IQ test that is accepted as the official standard. A number of accredited tests are used for official testing, and many more are used without accreditation (and probably should not be trusted as accurate measuring tools for the most part).

Among the accredited tests, each has its own variation on the domains and categories that are tested, but those variations are by and large similar in nature. With the exception of the Universal Nonverbal Intelligence Test (which intentionally seeks to measure intelligence apart from any reference to verbal growth and mastery for individuals who have speech, language, or hearing impairments or other related factors<sup>1</sup>), the norm is for testing to address various categories in both verbal and non-verbal manners.

As one example, the Stanford-Binet test (one of the earliest and most respected, now in its fifth edition) evaluates individuals across five factors of cognitive ability: fluid reasoning, knowledge, quantitative reasoning, visual-spatial reasoning and working memory<sup>2</sup>. These factors are tested "in two separate domains, verbal and non-verbal."<sup>3</sup>

## Can IQ Be Improved?

### The debate

An accredited IQ test is meant to provide a summative assessment of overall mental capacity rather than measure the individual's current level of growth and mastery. To the extent that it succeeds in that effort, the individual's IQ should theoretically remain somewhat constant throughout his life. Because the test is not designed as a knowledge-based evaluation, learning more information should not result in an increase in score. The ability to think and reason is quite distinct from the accumulation of factual knowledge.

However, not everyone would agree that an individual's IQ is really a constant, unchanging value. Many scientists, professors, educators and other experts believe that an individual can certainly improve his IQ through various means and methods.

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<sup>1</sup> "Universal Nonverbal Intelligence Test, Second Edition."

<http://www.mhs.com/product.aspx?gr=cli&prod=unit2&id=overview>. Accessed 09 March, 2016.

<sup>2</sup> "Stanford-Binet Intelligence Scales." <http://www.hmhco.com/hmh-assessments/other-clinical-assessments/stanford-binet>. Accessed 09 March, 2016.

<sup>3</sup> "Stanford-Binet." <https://www.stanfordbinet.net/>. Accessed 09 March, 2016.

## Studies Suggest at Least Temporary Changes

Studies of certain activities have at least indicated that IQ can be temporarily affected. For example, the often referenced “Mozart effect” describes how listening to specific works of Mozart’s classical music has been observed to improve mental performance. An early benchmark study in this area claimed the conclusion that IQ scores increased by about 8 to 9 points for individuals who listened to the music for 10 minutes. The effects of the music lasted about 10-15 minutes.<sup>4</sup>

Though the findings of this study have proven controversial, there are also some very interesting related studies in which the effects of the music on animals has been measured. For example, laboratory rats that were exposed to the Mozart pieces were able to complete mazes faster and with fewer errors than those exposed to white noise or silence.<sup>5</sup>

Many explanations might be given for temporary responses to stimuli, and understanding how those temporary responses work could be beneficial, but permanent increases in IQ levels would surely be far more important. The question remains, though: Is a permanent increase even possible?

## Relationship Between IQ and Intelligence

### Does IQ Accurately Represent Intelligence?

To understand the question better, we really need to explore the entire relationship between IQ and intelligence in general. How well does IQ even represent intelligence?

The answer to that question is complicated, and experts have many different perspectives on the explanation. Without trying to enter into all the details and various views, there are some basic points we can consider.

### ‘Types’ of Intelligence

As we explore the relationship between IQ and intelligence, it might help to distinguish between different aspects of mental development that might be referred to as “intelligence.” We have already noted the difference between measuring an individual’s store of knowledge and their mental capacity, which is a deeper dimension of intelligence.

Within that deeper dimension, however, we still need to distinguish yet further. One type of mental capacity, and perhaps the most accurate meaning of the strict, technical term, is the mere physical ability of the brain to perform its functions. How quickly do nerve impulses travel in someone’s brain? How much is the brain able to process as once? These traits vary from individual to individual and have a definite relationship to IQ. Is this also, then, a fair way to measure intelligence? The simple physical operation of the brain as an organ is at least one

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<sup>4</sup> “The Mozart Effect.” *Journal of the Royal Society of Medicine*. 2001 Apr. 94(4): 170-172. Accessed online 09 March, 2016. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1281386/>.

<sup>5</sup> “The Mozart Effect.” *Journal of the Royal Society of Medicine*. 2001 Apr. 94(4): 170-172. Accessed online 09 March, 2016. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1281386/>.

approach to defining intelligence as mental capacity, and the advance of technology has made it more measurable than ever<sup>6, 7</sup>.

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*“The best way to measure intelligence is to measure those abilities that underlie the acquisition of knowledge, separately from the knowledge we have.”*

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Approaching intelligence as something deeper than a store of knowledge does not mean it must be boiled down to the mere speed of physical activity in the brain, however. Between these two ends of the spectrum, we can identify another approach to intelligence: How skilled is someone at learning and applying various patterns of thoughts and ideas? This moves intelligence beyond the lowest level of knowledge acquisition and into the deeper realm of conceptualization and modes of thought, but it does not necessarily identify intelligence with mere speed of physical brain activity. One university research professor expressed this view, “The best way to measure intelligence is to measure those abilities that underlie the acquisition of knowledge, separately from the knowledge we have.”<sup>8</sup>

The skills and proficiencies measured in an IQ test probably most closely align with this last view of intelligence. An IQ test is not supposed to rely significantly on the size of the subject’s body of knowledge, nor is it designed to be a simple measure of processing speed. It does intentionally set out, though, to focus on proficiency across a number of distinct schema of thought patterns. It is worth keeping this approach in mind when we consider IQ and its relation to intelligence.

### Interconnectedness of Different Elements

So, an IQ test is generally comprised of analysis across a variety of thought disciplines, and intelligence itself is subject to being defined in various ways. In light of these facts, it might be pertinent to point out one other valuable reality about intelligence: Ultimately, each individual is a single, unique, unified, personal self where these various types of categories and skills cannot be neatly divided.

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<sup>6</sup> “Smart People Really Do Think Faster.” Hamilton, Jon. 20 March, 2009.

<http://www.npr.org/templates/story/story.php?storyId=102169531>. Accessed 09 March, 2016.

<sup>7</sup> “Speed Matters, But Not How You Think: IQ & Latent Factors in Reaction Time.” Chatham, Chris. 29 October, 2007. <http://scienceblogs.com/developingintelligence/2007/10/29/speed-matters-but-not-how-you/>. Accessed 09 March, 2016.

<sup>8</sup> “5 Experts Answer: Can Your IQ Change?” Cox, Lauren. 09 February, 2012. <http://www.livescience.com/36143-iq-change-time.html>. Accessed 09 March, 2016.

This obvious reality is reflected even in the testing structure itself and the scoring systems used in IQ tests. We have already pointed out, for example, that each of the five disciplines in the Stanford-Binet test is measured in both verbal and nonverbal ways. This fact alone already begins to show us something of how all the various disciplines are linked together in the testing process by either a verbal or nonverbal skillset. How can any of these areas be tested at all without relying on common, basic communication and processing skills of some sort?

Further, even though the test is broken down into distinct categories, it is not uncommon for testing analysis to offer scoring reports that draw from data in all of the categories to provide composite scores for different aspects of intelligence.<sup>9</sup> Examples of these subsets are memory, reasoning and quantitative scores. These skills (or aspects of intelligence) can be found across the difference disciplines being tested. Similarly, scoring can be done using only the verbal battery or only the non-verbal battery, resulting in scores for a “verbal IQ” or a “non-verbal IQ.”

### How Audio Learning Relates to These Elements

So, in light of this brief overview of the principles defining IQ, intelligence and the relationship between the two, how do audio learning tools enter into the picture and discussion?

### A Variety of Learning Types

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*“Engage all of your senses...the human brain learns best through multi-sensory association.”*

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As a starting point, we can appeal to the multi-faceted nature of intelligence and conclude that a diversity of modes of learning and thinking can only benefit one’s intellectual development. While a great deal of attention has been placed on written tools of learning, this should only be *one part* of the ideal learning experience. We receive, process, and communicate information in more than just written form, and if we are not careful, we can run the risk of neglecting other modes of intelligence. There is a definite value in intentionally focusing on a variety of learning disciplines, and the same can also be said for incorporating a variety of learning modes, including auditory learning tools. It is a wise approach to combine as many senses as possible in the learning process: “Engage all of your senses. Researchers have found that the human brain learns best through multi-sensory association.”<sup>10</sup>

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<sup>9</sup> “Universal Nonverbal Intelligence Test, Second Edition.”

<http://www.mhs.com/product.aspx?gr=cli&prod=unit2&id=overview>. Accessed 09 March, 2016.

<sup>10</sup> “Fourteen Ways to Increase Your IQ.” <http://daringtolivefully.com/increase-your-ig>. Accessed 09 March, 2016.

## Music as an Example

Take music as an example of this value that is found in diversity. We have already noticed how simply listening to certain musical pieces can have a positive impact on mental functionality. Researchers have also examined other aspects of how involving music in education impacts intellectual development.

One type of approach to studying this question is to measure the impact on students who learn about music. One such study measured the growth of student IQ according to certain types of lessons that they were given. A body of students was divided into groups, and some received free music lessons, while others received free drama lessons or no additional lessons beyond normal classroom instruction. In this study, the IQs of all the groups increased on average, which is a common result for schooled children, but the increase was nearly double for those who were given music lessons.<sup>11</sup>

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*“Essentially the architecture of the brain changes.”*

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Another study indicated that regularly playing a musical instrument leads to benefits in more than one way. For one thing, IQ can improve by a number of points, but interestingly, the very structure of the brain can be altered through the process of repeated training and practice. One expert commenting on the research summarized the finding, “Essentially the architecture of the brain changes.”<sup>12</sup>

## Audiobooks for Learning

Music is one obvious audio tool that can be used to aid learning, but another that is coming more to the forefront is the use of audiobooks. Music has long been a part of society and education, and storytelling has as well, but technology has now opened the door for educators to incorporate audiobooks into the learning process, and there are a number of compelling reasons to consider doing so.

## Improved General Verbal Skills

Remembering that IQ tests rely upon verbal skills throughout the various domains being tested, we should be glad for any tool that improves those verbal skills in general. This is not only a matter of IQ scores, either. Rather, the general ability to function intelligently consistently

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<sup>11</sup> “Music & IQ.” <http://sciencenetlinks.com/science-news/science-updates/music-iq/>. Accessed 09 March, 2016.

<sup>12</sup> “Playing a Musical Instrument Makes Your Brainier.” Alleyne, Richard. 27 October, 2009. <http://www.telegraph.co.uk/news/science/science-news/6447588/Playing-a-musical-instrument-makes-you-brainier.html>. Accessed 09 March, 2016.

requires the mastery of verbal skills. A deficiency in those skills complicates many related intellectual tasks, and a true mastery of those verbal skills would provide a great advantage.

### Allows Focus on Comprehension and Memory

As an example of the advantages on offer from the use of audiobooks, consider the application of their use for training in comprehension and memory. Throughout the learning process, students are often asked to demonstrate an ability to recall key pieces of information from a text and to demonstrate an understanding of the concepts and ideas within the text.

Now, especially for younger students who have yet to develop full reading proficiency, this can be a difficult task. When the very act of decoding written symbols in the reading of a text requires a significant amount of the student's focus and energy, it is a rather difficult task to then also focus on remembering and comprehending what is read. While students must certainly learn the mastery of this skill, the use of audiobooks can remove some of the obstacles of the written text and enable students to focus on developing those other skills in the meantime.<sup>13</sup>

Indeed, the ability to remember what is heard and understand what is expressed in a discourse is of extreme value and must be counted among the key traits of intelligence. Providing students the opportunity to accelerate that aspect of their development would certainly be counted a significant benefit. The lack of practice and experience in listening to and analyzing verbal discourse is a costly omission from both the studies and the life experiences of many students today.

### Audiobooks Result in Improved Reading Scores

In an interesting and profound demonstration of how interconnected these various intellectual activities are, the use of audiobooks has actually been found to improve reading scores for students who use them on a regular basis.<sup>14, 15</sup> How could removing the emphasis from the written text actually help students learn to manage the written text? Again, when we realize how comprehension applies equally in both written and spoken contexts, this makes perfect sense. As students gain comprehension skills through one form, they can transfer those same skills over to another form without great difficulty.

### Auditory Learning and Processing

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<sup>13</sup> "Listening, Literacy and the Common Core: How Audio Books Improve Reading Ability by Meeting Specific ELA Standards." <http://www.techlearning.com/events/0004/listening-literacy-and-the-common-core-how-audio-books-improve-reading-ability-by-meeting-specific-ela-standards/62489>. Accessed 09 March, 2016.

<sup>14</sup> "Audio Books Improve Reading Scores." <https://www.smores.com/p58z-audio-books-improve-reading-scores>. Accessed 09 March, 2016.

<sup>15</sup> "Use of Audiobooks in a School Library and Positive Effects of Struggling Readers' Participation in a Library-Sponsored Audiobook Club." *School Library Research. Research Journal of the American Association of School Librarians*. Volume 16, 2013. Jeff Whitingham, Stephanie Huffman, Rob Christensen, and Tracy McAllister. [http://www.ala.org/aasl/sites/ala.org.aasl/files/content/aaslpubsandjournals/slr/vol16/SLR\\_Use\\_of\\_AudiobooksV16.pdf](http://www.ala.org/aasl/sites/ala.org.aasl/files/content/aaslpubsandjournals/slr/vol16/SLR_Use_of_AudiobooksV16.pdf). Accessed 09 March, 2016.

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*“Hearing is the primary resource for retention.”*

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When we step back and consider how broadly prevalent auditory communication is in the general process of life, it really is no surprise that gaining skills and understanding of that process would set a student in good stead in many ways. The reality is, as valuable and important as skills such as reading are, “hearing is the primary resource for retention.”<sup>16</sup> Students will almost certainly receive more and share more information through oral communication in their lifetime than through written communication. Mastering the skills involved in understanding that communication process is an essential life skill that manifests itself in countless ways, including the very act of taking an administered IQ test with oral instructions.

### Examples of Improvement in Practice

For the final segment of our study, let’s take a look at a couple of case study examples related to this discussion, including one where the specific use of audiobooks made a significant difference. While these tools could be used in nearly any setting with the potential benefits to be expected, one situation for which they hold great promise is as an aid to students who are struggling to advance along with their classmates at the expected rate of progress.

“Low IQ: Fact or Interpretation?”

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*“After 30 years of working in special education, many of them in public schools, I no longer have much faith in the IQ tests and their interpretations.”*

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In our first article, an educator with more than 30 years of experience working in the field of special education reveals her perspective on IQ levels of struggling students, the correct way to view the meaning of those IQ scores, and her experience of interventions that proved helpful in addressing the struggles of such students.

The starting point as this teacher relates her experience to us is what took place in her analysis of students who came to her with low IQs that led to their being classified as “slow learners.” She

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<sup>16</sup> “How Audiobooks Make You Smarter.” Entrepreneur Publishing. 2015.

explained that “after 30 years of working in special education, many of them in public schools, I no longer have much faith in the IQ tests and their interpretations.”

Why is this? She believes that the intention of IQ tests to measure intellectual levels is thwarted by the underlying reliance upon auditory processing skills throughout the testing process. Basically, so much of the testing process requires students to listen to and understand audible instructions or information that this is really the primary skill and proficiency being tested. Thus, if a student struggles with auditory processing, the IQ testing process will indicate that the student has a low IQ and perhaps even that he is a slow learner, although the reality may be that he simply needs help developing his auditory processing skills.

This educator explains how she often interpreted the results of IQ testing in light of this perspective and provided interventions to the students based on the assumed primary need to improve auditory processing. She relates that the results were often very encouraging, with students able to improve their IQ scores significantly over the course of a year of training with various interventions. It was not unusual for a student to be able to test high enough that he or she was no longer considered to be a “slow learner.”

The focus of this educator’s experience was not specifically on audiobooks, but her identification of the basic problem as one of auditory processing and her success in helping students on that basis is very pertinent. Basically, certain students with low IQs may simply have a need to learn how to process auditory information more effectively. They need practice, guidance and instruction in how to master that skill, and this is directly in line with one benefit of and motivation for utilizing audiobooks as learning tools.<sup>17</sup>

### Improved Reading Skills of Children with a Mild Intellectual Disability

In our second study, two middle school teachers determined to test the use of audiobooks as supplementary aids with students identified as having a mild intellectual disability.<sup>18</sup> These students were identified by their IQ scores, with a score in the range of 50-70 classified as indicating a mild intellectual disability.

Students were placed in control and experimental groups and required to read 20 minutes per school day during an intervention period. The experimental group was given access to audiobooks as an aid to their reading, and the control group was not provided the audiobooks.

Based on testing of the students both before and after the duration of the study, the authors found that the gains in reading fluency demonstrated by the experimental group (those with audiobooks) were significant. The average fluency rate for the students increased from 55 correct words read per minute to 75 correct words read per minute. While this still was some distance short of the national average of 120 correct words per minute, it was still a very significant increase.

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<sup>17</sup> “Low IQ: Fact or Interpretation?” Dianne Craft. <http://www.diannecraft.org/low-iq-fact-or-interpretation/> Accessed 09 March, 2016.

<sup>18</sup> “The Impact of Audio Books on Middle School Students with a Mild Intellectual Disability.” Schanck, Justin and Waller, Milkia. *The Corinthian. The Journal of Student Research at Georgia College*. Volume 14. <https://corinthian.gcsu.edu/volume-14/impact-audio-books-middle-school-students-mild-intellectual-disability>. Accessed 09 March, 2016.

Within this research, the authors told of one particular student's case who received individual tutoring for the duration of a school year. He was an eighth grader, but his reading rates were measured to be on a third grade level. Through the use of interventions including audiobooks, he was able to increase his fluency considerably during the course of the study.

Interestingly, however, the study results suggest that his reading rates really only increased when reading certain types of materials. When reading biography, his reading rates remained the same, but when reading books with narrative texts or books that he indicated he was interested in, his rates increased substantially. The authors suggest that this reveals the importance of allowing students to read texts that interest them, and this is yet another potential benefit of audiobooks in that they are able to appeal to the student through the additional features that are not possible to provide through only written text. These additional features can provide extra excitement and engagement that will help students become more involved in the reading process.

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*“Since the reading process develops through our experiences with oral language, audiobooks simply provide another opportunity to increase the understanding of written word.”*

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As the authors attempted to analyze the relationship between comprehension of audiobooks and that of written text, they focused on a few key aspects of the natural learning process. They remind us that “the reading process develops through our experience with oral language.” That is, we first learn to interact with language in oral form, and later those skills are transferred to the realm of language in written form. It is a valuable reminder that our form of representing language in writing is based upon the phonetic sounds of the written symbols. The basis for reading, to begin with, is simply the ability to transfer the written form to the correct corresponding sounds. Then the student is in the same position of needing to be able to understand and comprehend that language in its oral form.

The authors assert that more and more children enter school today without the same degree of exposure to oral forms of text. Specifically, children are not read to by parents and other adults as much as they used to be. This seemingly basic activity actually provides a great deal of beneficial exposure to language and text, and students have far less practice with those skills when they first enter school today. Audiobooks provide an opportunity for that deficiency to be addressed. Audiobooks, storytelling and reading aloud “familiarize students with the sound and sense of written language.”

## Conclusion

The use of audiobooks in helping students improve their IQ, then, appears to be a fruitful tool in many situations. They provide students the opportunity to gain experience in interacting with written texts without the additional burden of symbolic decoding, thereby enabling them to develop their processing and understanding skills. The centrality of auditory communication and processing in a wide range of daily activities only serves to emphasize the importance of this skill further. (There are many additional articles that could be referenced to support the case.)<sup>19</sup>

The reality is, too, that we have barely even touched on many of the secondary benefits of audiobooks, such as the excitement and creativity that they can bring to a student's experience of literature. Adventure and imagination are valuable parts of the learning process. If nothing else, the very fact that students tend to enjoy audiobook productions is a strong case for their use. Getting students interested in reading, after all, is often half of the battle.

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<sup>19</sup> "Research & Articles on the Benefits of Audiobooks for Young People."  
<http://www.audiopub.org/Annotated%20Bibliography%20of%20Literature%20on%20Benefits%20of%20Audiobooks%20for%20Young%20People%20-%20Final.pdf>. Accessed 09 March, 2016.

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