

The Evolution of Braille: Can the Past Help Plan the Future?

A three-part article from the Braille Authority of North America

Part 3

The Challenges Ahead

Previous installments of this article traced the changes in braille and print production methods over the past decades and discussed some of the challenges caused by the interaction of current codes with current production methods. This final section discusses the history of efforts to resolve these issues and briefly outlines possible solutions.

With the proliferation of better and more efficient technology, the relevance of braille as a reading and writing medium is frequently questioned. Technology has made it easier than ever for people who are blind to access a wide variety of texts, to create print documents, and to be more productive at work and home. Some people report that they can read faster with speech than with braille—and they probably can. But are those same people continuing to use braille? Have the ways braille readers use braille in their daily lives changed so dramatically that it should impact the development of braille codes?

The answer to both questions is a resounding yes. While the ways people are using braille have changed over the years, braille remains a viable and crucially important medium for communication. Speech access allows for quick skimming of information, but braille gives access to text in a manner that allows the reader to read independently and to see the spelling of words, the format of documents, and the symbols used. For these reasons, it's imperative that the codes are kept up to date so braille users can read and write accurately.

For many years, BANA has continued to make small changes to the braille code where absolutely necessary. Out of consideration for the impact on braille readers, teachers, and transcribers, BANA has acted conservatively in making changes. However, the “small fixes” made over the years have, in some cases, increased the complexity and ambiguity of the braille code. An example of how an effort to make a seemingly simple change to the code led to bigger complications was illustrated in the second installment of this article. To resolve many of the shortcomings of the current braille code outlined in the previous installments, serious efforts at code restructuring have taken place in the past two decades. A more comprehensive approach was needed to create flexible solutions for the changing needs of braille users.

Unified English Braille

The first of these efforts was the Unified English Braille (UEB) code project, which was initiated in 1992 by the Braille Authority of North America (BANA). The impetus for this effort was a memorandum sent to the BANA Board in January, 1991, by Abraham Nemeth and Tim Cranmer. In this memo, Drs. Nemeth and Cranmer expressed their concern over the "proliferation of braille codes" with different symbols for common characters. They stated: "For a long time now, the blindness community has been experiencing a steady erosion in braille usage, both among children and adults. This trend shows no sign of abatement, so that there is now a clear and present danger that braille will become a secondary means of written communication among the blind, or that it will become obsolete altogether." Later in their memo, they cited "the complexity and disarray" of the braille codes then in use, and they asked BANA to give the braille code a major overhaul to improve its usability and flexibility. They stated clearly: "It is time to modernize the braille system." Based on the recommendations in this memo, BANA established a committee to explore the development of a unified code.

The original intent of the unified code project was to explore the possibility of bringing together three of the official braille codes that are used for various purposes: English Braille, American Edition (literary material), Nemeth Code (mathematics and scientific notation), and Computer Braille Code (computer notation). In 1993, the project was adopted by the full International Council on English Braille (ICEB). The project was expanded in scope to explore the possible unification of the braille codes that are used for those purposes in all seven ICEB member countries: Australia, Canada, New Zealand, Nigeria, South Africa, United Kingdom, and the United States. Work to develop a unified code was conducted primarily by braille readers in those countries with input from transcribers and educators.

At the time the project began, the braille codes used for English literary purposes were similar, though not identical, in most English-speaking countries. Because of this, substantial preservation of that code was one of the basic goals in the development of UEB. However, the codes used for technical purposes in the other ICEB countries were very different from those used in the BANA countries, so that UEB can be regarded as bringing together the braille codes used in different countries as well as those used for different kinds of notation. The only notation specifically exempted from consideration under the UEB project was the music braille code, which was already and still is a well-accepted international code.

In the initial stages of UEB development, one of the most pressing issues to be decided was the placement of numbers. In the U.S., numbers in the literary code were written using the four dots in the upper portion of the cell while in math and science, numbers were written in the lower portion of the cell. For a consistent code, one method for writing numbers had to be chosen, using either the upper or lower part of the cell.

In addition to these two possibilities, a third way of writing numbers was considered. Called "dot 6" or "Antoine" numbers, this system forms numbers by using the same dots as upper-cell numbers with dot 6 added. In this system, 1 is dots 1-6, 2 is dots 1-2-6, and so on. The zero departs from this pattern. Dot 6 numbers are still widely used in France, Germany, and other European countries.

To decide which system of numbers should be used, the committees, both in the U.S. and internationally, looked at the ramifications of using upper numbers, lower numbers, or the dot 6 numbers. Using lower numbers would mean changing all of the punctuation signs or having a special mode for numbers. The number sign would still have been needed in most cases because numbers standing alone could easily be misread. Use of Antoine numbers would mean losing ten frequently-used contractions, and many people reported that they were slower to read. Upper numbers had the advantage of being familiar to everyone and not conflicting with punctuation. In an analysis conducted using literature that contained frequent numbers, such as math and economics textbooks, numbers were found to come in contact more frequently with punctuation than with letters. After intense debate, the familiarity of the standard upper number system with its advantage of keeping current punctuation was judged to be more important and suitable, especially for the general reader. Based on this rationale, the upper number system was selected for all purposes within UEB.

A full discussion of all characteristics of any code would be beyond the scope of this article. However, the primary changes in UEB from the current literary code used in the U.S. are:

1. Spacing: Words that are currently written together such as "and the" must have a space between them as they do in print.
2. Less ambiguity: Nine contractions are eliminated: "ally," "ation," "ble," "by," "com," "dd," "into," "o'clock," and "to" because of translation difficulties and confusion with other symbols.
3. Punctuation: A few punctuation marks are different (for example, parentheses are two-cell sequences of dots 5, 1-2-6 and 5, 3-4-5). This change follows a new systematic pattern developed for creating symbols in UEB. In addition, symbols are included for different types of brackets, quotation marks, dashes, and others to show the braille reader exactly which symbol is used in the original text.
4. Indicators: Bold, underline, and italics each have their own indicators. There is a method using three capital signs to show a long passage of uppercase text.
5. Math symbols: Numbers are shown in the upper portion of the cell as they are now in literary braille; operational symbols such as plus and

equals, which do not exist in current literary code, have been added and are different from those in the Nemeth code.

In 2004, the international community voted that UEB was sufficiently complete to be considered an international standard and for braille authorities of individual countries to vote on its adoption for their respective use. To date, UEB has been adopted in six of the seven ICEB countries, including Canada. The United Kingdom voted in favor of UEB adoption in October 2011.

Nemeth Uniform Braille System

The decision to write numbers in the upper portion of the braille cell had a major impact on the technical aspects of the development of UEB.

Dr. Abraham Nemeth, the developer of the Nemeth Code for Mathematics and Science Notation, recently completed development of a code that uses lower numbers throughout called the Nemeth Uniform Braille System (NUBS). Like UEB, it is also designed to represent literary, math, and computer information--combining all three codes into one unified system. While this system proposes changes to some parts of all three codes, it makes no changes to current literary braille contractions.

The primary changes from the present literary braille code would be:

1. Numerals: Numbers in all contexts occupy the lower part of the cell; these are referred to as "dropped numbers."
2. Use of modes: There are two modes—*narrative*, for normal literary material, and *notational*, for numeric and technical material. Notational mode is invoked with the number sign (dots 3-4-5-6) or by the "begin notational mode indicator" (dots 5-6). Notational mode is terminated by a dash or a space when the space is not within a string of numbers or a mathematical expression. Notational mode can also be terminated by a hyphen or a slash, and when these characters are not followed by a space, they are preceded by a dot 5. Contractions are not allowed in notational mode.
3. Punctuation: Proposed changes in punctuation include new symbols for parentheses, brackets, quotation marks, and the dash. Because the NUBS symbols for parentheses (dots 1-2-3-5-6 and dots 2-3-4-5-6) could be confused with the words "of" and "with," a punctuation indicator (dots 4-5-6) must precede each parenthesis when used in narrative mode. The semicolon, exclamation point, and question mark remain unchanged, but require a punctuation indicator in notational mode to distinguish them from digits. The period, the comma, and the colon are completely different in the two modes.

4. Type indicators: There are some changes in the technique for capitalization and for implementing italics and other types of emphasis.

Similarities of the Codes

Both proposed codes employ the use of "modes." It should be noted that even the current literary code uses modes, although they are not often referred to in this way. For example, when the word "dance" is written in contracted braille, it uses three cells (d, dots 4-6, e). When a number sign is placed before these three cells, their meaning is completely different; that is, it becomes the number 4.5. It can be said that the number sign has invoked a "numbers mode." Similarly, the use of a letter sign before a "c" changes the "mode" so that "c" means "c" instead of "can."

Although modes are not a feature requiring much notice in current literary code, the concept is inherent in the code. Modes do not create conflict within a code if their application is systematic. Part of the problem with current codes, however, is that the concept is not applied systematically, and creates conflict and ambiguity. Both UEB and NUBS were designed to be systematic in their application of modes and symbol construction.

At a Crossroads

As clearly indicated in the previous parts of this three-part article, braille in the United States must change to keep up with current trends in publishing and technology. It must also be more flexible and responsive to changing conventions of text. Two new braille codes have been developed, one of which has been adopted internationally. Both codes were developed with an effort toward retaining as much of the current literary braille code as possible; both codes have the reduction of ambiguity as a guiding principle to facilitate ease of learning and production. Easier facilitation of forward and backward translation would make it simpler for the user to create print documents and would also make the "on-the-fly" translation required for accessing the screens of computers and mobile devices much more accurate and reliable. It could also significantly reduce the cost of producing paper braille, which could have the effect of making much more braille material available for readers.

BANA will soon be at a critical juncture. It appears we have several choices as to how to proceed:

1. We can continue to tinker with the current codes we have, potentially making them less easy to use and more ambiguous;
2. We can adopt UEB, as have all of the other ICEB countries;
3. We can adopt NUBS;

4. We can do nothing at all to change braille, realizing this might cause braille to become obsolete.

The BANA Board recognizes that to preserve the viability of braille, changes must be made. The BANA Literary Technical Committee believes that continuing to make small changes to the current code will place braille readers and transcribers in an ever-worsening spiral of ever more complicated braille codes. The committee recommends that BANA adopt a system such as UEB or NUBS that was designed to be extendible, flexible, and consistent.

BANA is conducting an impact analysis that will look at the costs and benefits of making changes to the current system of codes as well as the costs inherent in *not* changing. The impact on transcribing and embossing various materials, training of new teachers and transcribers, the retraining of current braille teachers and transcribers, costs for creating e-texts, and other critical factors are being considered.

Any major change in braille would necessitate careful planning and implementation. New code books would be needed, as well as training sessions for transcribers and teachers. A phase-in period would be necessary with diligent attention to the needs of all braille readers—from the very youngest who are just learning to read and write to the reader who has known and loved braille for many years. The most important consideration of all is to keep braille as practical, usable, and flexible as possible in the future as it has been for the past 150 years.

As BANA examines the past and considers options for the future of braille, we encourage you to share your ideas, concerns, and suggestions with BANA Board members. Please visit www.brailleauthority.org and share your thoughts with us.

References

For more information about the history of current braille codes, UEB, and NUBS, please see the following references and resources.

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