Organizing and Describing Information for Children

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In June 2012, the Kansas Association of School Librarians brought a Statement of Concern before the Affiliate Assembly of the American Association of School Librarians (AASL):

“Many school librarians are questioning the method of arranging their library collections. The move away from Dewey classification to genres has resulted in confusion, unanswered questions, and a variety of attempts. We are seeking guidance from AASL to provide answers and guidance in this popular trend. Is it a viable way of arranging library materials; and if so, please help in setting standards and appropriate genres for different age levels.” (Jameson, 2013, p. 11)

This statement reflects a growing trend in school and public libraries, to move away from organizing informational materials according to the Dewey Decimal Classification (DDC) and fictional materials according to author, and toward arranging both types of materials by genre or topic.

Rather than offer a response immediately, AASL convened a panel at the following American Library Association (ALA) Midwinter Conference to discuss the various sides of “the Dewey Debate” (Weisburg, 2013). The discussions were so heated that the AASL Executive Committee determined that further conversation on this topic was required. To facilitate this, AASL devoted the November/December 2013 issue of its practitioner journal, *KnowledgeQuest*, to the topic. In her column for that issue, 2013-2014 AASL president Gail K. Dickinson states that AASL “is leading the way on this issue and others, not by pronouncement or fiat, but rather by providing a space for school librarians to learn from each other and grow” (Dickinson, 2013, p. 6). She indicates, however, that if the organization were to make a recommendation regarding best practices in organizing materials for children, such a recommendation would be based on empirical research. While AASL has not made such a recommendation, school and public librarians who organize materials for children can benefit from an examination of the research on the subject; such an examination also reveals opportunities for scholars of youth services in libraries to contribute further research in this area.

Developmental psychology tells us that children have different cognitive capacities than adults (Bilal, 2007; Druin, 2005; Kuhlthau, 1988). Information retrieval research findings illustrate how this plays out in children’s information behaviors and provide a starting point for designing information organization systems that meet children’s unique needs. Controlled vocabularies and hierarchies can be designed to match children’s vocabulary and cognitive structures, providing a higher information seeking success rate. Metadata schemas designed for children should include classes and attributes of resources that adults might not consider, such as physical appearance, age of main character, and text complexity. Vocabularies, hierarchies, and schemas can be designed not just with children’s needs in mind, but with children as partners in the design process. While there is some research describing the design process and its products, little research addresses the effectiveness of child-driven information organization schemes. Future research might address this gap.

Child Development, Information Needs, and Information Behaviors

Most school and public libraries use the Dewey Decimal Classification system to organize informational texts and organize fiction texts by author’s last name. This method of organizing materials was designed with adult users in mind. Similarly, many digital information organization systems were created primarily for an adult audience. Children have unique developmental needs that influence their information needs and behaviors (Bilal, 2007; Druin, 2005; Kuhlthau, 1988). The full extent of how these developmental needs influence information

needs and behaviors is outside the scope of this literature review; this review will address specifically how these needs relate to organizing information for children's use.

Based on her own research and the cognitive development theory of Jean Piaget, Kuhlthau (1988) identifies four stages of child development: early childhood (Piaget's pre-operational stage), middle childhood (Piaget's concrete-operational stage), preadolescence (a transition between Piaget's concrete-operational and formal-operational stages), and adolescence (Piaget's formal-operational stage); Kuhlthau describes the impact of these developmental stages on library use. In early childhood, ages 2 to 7, children are not yet ready to work with formal classification systems, but are able to understand that favorite materials can be predictably located in the same place each time they visit the library. As they move through middle childhood, ages 8 to 10, children develop their own ability to categorize and classify materials, distinguishing readily between fiction and nonfiction. They can understand that one of the purposes of categorization and classification is to collocate related materials. They can also use subject headings to find materials, though the gap between their vocabulary and the subject headings might require iterative searching and browsing. By the end of this stage, children are ready to begin using full formal classification schemes such as the Dewey Decimal Classification. In preadolescence, ages 11 to 14, children are transitioning and are on their way to adulthood. Their needs and cognitive capacities shift rapidly, but there is not a set of needs or abilities related to classification and categorization that distinguishes this stage from middle childhood. By the time they reach adolescence, ages 15 to 18, children have developed many of the cognitive capacities of adults; information systems designed for adults should meet their needs as successfully as they meet adults' needs. Because of this, research on organizing information for adolescents is outside the scope of this literature review.

These developmental stages provide a foundation for understanding the findings of the studies described in this literature review. While Kuhlthau provides an overview of children's needs, the literature on children's information-seeking behavior and information organization provides specific examples of how these developmental stages manifest in the information environment.

Information Retrieval and Information Organization

The richest literature on children's information behaviors is in the field of information seeking and information retrieval (IR). While an in-depth look at such literature is outside the scope of this literature review, IR research does provide some insight into some key considerations for information organization. This research includes such areas as searching and browsing behaviors, child-friendly interface design, and mismatches between child-generated search terms and controlled vocabularies.

Several of these studies indicate that existing information systems conflict with children's cognitive abilities, conceptual skills, and vocabularies. In particular, keyword search presents difficulties, as it relies on children inputting search terms that match the terms used to describe the information (C. L. Borgman, Hirsh, Walter, & Gallagher, 1995; Busey & Doerr, 1993; Hirsh, 1997; Hutchinson et al., 2005; Pejtersen, 1986, 1989; Sandlian, 1994; Solomon, 1993; Walter, Borgman, & Hirsh, 1996). Children are more successful at finding information using browsing rather than keyword searching (Beheshti, Large, Julien, & Tam, 2010; Bilal, 2000, 2001, 2002; C. Borgman, Chignell, & Valdez, 1989; C. L. Borgman et al., 1995; Large, Beheshti, & Rahman, 2002; Pejtersen, 1986; Sandlian, 1994; Walter et al., 1996). For browsing to be effective, it is key that information be described and organized in a way that enables children to find the relevant information about a resource and determine if it meets their needs. To ensure this happens, we

must build controlled vocabularies, information hierarchies, and metadata schemas with children's developmental needs in mind.

Controlled Vocabularies

A controlled vocabulary is an organized list of words or phrases used to label content in order to facilitate information retrieval (Leise, Fast, & Steckel, n.d.). Rarely have controlled vocabularies been developed with children in mind. Some standard controlled vocabularies have been modified for use with children's resources. Borgman and colleagues, when designing the Science Library Catalog, an online catalog of books related to science topics, originally used the Dewey Classification Schedule terms to describe materials located in a particular section of the catalog's hierarchy (C. L. Borgman et al., 1995). As they generated and tested a vocabulary using these terms, however, they found that many were inappropriate for the reading level of their users, aged 10 to 12. In response to this, they started over, generating a new controlled vocabulary from subject headings applied to works in the catalog and terms used in the titles of works.

Abbas (2005) suggests that the Library of Congress's Annotated Card subject headings could provide a scaled-down vocabulary for use in describing materials for children, but points out that reducing the number of terms also reduces the system's ability to represent a wide variety of materials. According to Abbas,

Jansson, as reported by Lundgren (1998), developed a special thesaurus for children consisting of about 800 simple, concrete words within 21 areas of interest. Librarians using the list to represent documents are encouraged to supplement it when necessary.

This list has been distributed to libraries in Sweden, where, Lundgren reports, it has met with much approval. (Abbas, 2005, p. 1513)

In light of this lack of child-centered controlled vocabularies, Abbas (2005) studied the extent of matches between children's search terms and the controlled vocabulary used in the ARTEMIS Digital Library (ADL). The ARTEMIS Digital Library is a database of records describing web resources for middle and high school science students. Abbas gathered transaction logs of sixth grade classes' use of the ADL, collected from January 2001 to May 2001 from 32 schools, most of them located in the United States. The unit of analysis was a "user group," a group of "two to three students randomly placed in groups by the teacher" (p. 1516). A total of 754 user groups provided data that fit the requirements of the study.

Abbas compiled a list of terms used five times or more in children's searches; after filtering out terms with misspellings, typographic errors, off-task terms, terms containing geographic names, and terms with Boolean operators or other unsupported search techniques, Abbas was left with a list of 466 terms. These terms were compared with the ADL's Controlled Vocabulary (CV) and coded for extent of match with the CV. Of the 466 terms, only 145 were exact matches for terms in the CV. The remaining terms either did not match at all (163 terms) or were partial/synonymous matches (158 terms). Abbas concluded that the CV terms did not "adequately represent the user groups' information needs" (2005, p. 1519) and that this finding justified the addition of "student-generated keywords" (SGKs) to the controlled vocabulary. A final list of 205 SGKs was added to the ADL Controlled Vocabulary. Abbas concludes, "Providing user-centered, age-appropriate representations is no easy task, but it is one that can be improved by using the student's own words" (p. 1520).

Information Hierarchies

As mentioned earlier, children are most successful at meeting their information needs when they are able to browse categories of information. While a simple controlled vocabulary is

useful in facilitating information retrieval, a hierarchical system is more effective for browsing. Studies have examined children's browsing-behavior when interacting with adult-generated hierarchies; they have also explored how children create their own hierarchies. Children's browsing and categorization behaviors can inform the design of information organization systems.

Adult-generated Hierarchies

The Science Library Catalog. In a pilot study early in their design of the Science Library Catalog (SLC), Borgman and colleagues found that children in the late elementary school grades were able to organize science topics into hierarchies (C. Borgman et al., 1989). They found, however, that the categories children generated were too idiosyncratic to be used to create a category system for use by a wide variety of children. Based on this finding, they implemented in the SLC a hierarchical system of organization based on Dewey Decimal Classification (C. L. Borgman et al., 1995).

Over the course of four experiments involving children ages 9 to 12, with 32 to 34 children in each sample, they asked students to explore the SLC to find books about six to eight specific science topics; in the first three experiments, all topics were chosen by the experimenters, but in the last experiment, the children were allowed to choose one of the topics. In all four experiments, children were able to navigate the hierarchy successfully in most cases. The DDC hierarchy seemed much more useful for science topics than technology topics; in science, it is divided by discipline (Physics, Chemistry, Biology, etc.) but in technology its divisions are less clear-cut. Additionally, at the time of the study, elementary school students tended to study science topics more than technology topics, so vocabulary mismatch might have contributed to this difficulty. Borgman and colleagues also found that children struggled more as the database of records became larger and the hierarchy had more levels; in one experiment, the hierarchy was six levels deep. In the final form discussed in the article, the SLC hierarchy only extended four levels.

The Kid's Catalog. Busey and Doerr (1993) drew on the Science Library Catalog hierarchy when designing the Kid's Catalog, a browseable graphic user interface to help children find books in school and public libraries. One portion of the Kid's Catalog, titled "Explore," consisted of a visual hierarchy using icons; unlike the Science Library Catalog, which only drew on two of the DDC top-level classes (500 Science and 600 Technology), the Kid's Catalog covered a much wider range of subjects. Busey and Doerr prototyped and tested a DDC-based hierarchy for this portion of the Kid's Catalog, but they found that the discipline-based organization of the DDC "was not relevant to children's information needs" (p. 79). With this in mind, they increased the number of classes in their hierarchy from ten to fifteen and featured classes based specifically on children's expressed interests such as "Animals," "Scary Stuff," "Jokes & Cartoons," "Sports & Games," and "Fairy Tales & Myths." To determine which classes to include, they reviewed curriculum guides and browsed the shelves of the Denver Public Library.

Child-generated Hierarchies

While Bilal and colleagues (1995) and Busey and Doerr (1993) drew on the Dewey Decimal Classification as the basis of their hierarchies, some researchers have asked children to create their own hierarchies. These hierarchies can be used to inform the design of information systems intended for children's use.

Typification and library intersubjectivity. Cooper examined the cognitive categorization process of children in grades Kindergarten through 4 in an extensive case study (2002a, 2002b, 2004a, 2004b). Cooper introduces the concept of personal typification, cultural typification, and the typification shared by a thought community. In the case of personal typification, we construct categories based on our own experiences. To communicate using cultural typifications, we must move over time from a personal and idiosyncratic view to one that consists of intersubjectivity, an understanding of shared meanings of categories. In a more specific thought community, such as a library, there will be specific typifications rooted in the practices of that community; in a library, for example, typifications might be embodied by a system such as Dewey Decimal or Library of Congress Classification.

As a school librarian, Cooper was interested in applying this theoretical foundation to the school libraries where she worked in order to organize her collection so that children could find materials in the library independently. Between the two schools where she worked, 518 children in grades kindergarten through 4 participated in the study as part of their regular weekly visits to the school library. The case study took place over the course of four sessions. In the first session, students were asked to brainstorm a list of materials they thought it would be important to have in the collection of a hypothetical school library. Cooper selected terms from this list and, in the second and third sessions, asked students to sort them into categories and then name those categories. In session 4, students were given a list of the categories they generated in session 3 and asked to place them on a graphic representation of a bookshelf to indicate how they thought those materials should be placed in the library in relation to one another. In session 5, students repeated the process from session 3, but this time focusing only on terms related to animals.

Cooper found that children in kindergarten and grade 1 tended to primarily categorize terms either as People or Animals; both informational texts and fictional texts about these topics were collocated under the two categories. Children in grades 2 and 3 maintained the People/Animal distinction, but also distinguished between fiction and non-fiction. The concept of fiction vs. non-fiction is a library-based typification; children's tendency to distinguish between these categories indicates their increasing intersubjectivity with the library thought community's typifications. Students in grade 4 created many more categories than students in the lower grades did. Overall, Cooper found that younger children's categories were "less detailed and more concrete," while older children's were "more detailed and abstract" (Cooper, 2004b, p. 325).

Based on this study, Cooper (2002a) concludes that students gain a more socialized conception of information categories over time, increasing their intersubjectivity with the library as evidenced by the use of terms such as "fiction" or "non-fiction" and the placement of terms in categories that more closely resemble the categories of the Dewey Decimal Classification system as they get older, as well as the ordering of those categories according to alphabetical order. Cooper (2004b) posits that this shift cannot be attributed exclusively to developmental changes, but rather that in the two school libraries studied, students interacted with a curriculum carefully designed to teach them how to use the school library, and so students who had received this curriculum longer had more intersubjectivity with the library. Cooper (2004b) suggests that school librarians "may wish to consider the cognitive categories that their own students have for library information at different grade levels. They may wish to consider accommodations to possible differences in cognitive categories for library information that support their students' information behaviors" (p. 330).

Web directories. While Cooper (2002a, 2002b, 2004a, 2004b) compared children's categories with library-based categories, Bilal and Wang (2005) sought to determine the extent to which the hierarchies of web directories matched with children's conceptual structures of science topics. The sample for their study consisted of 11 seventh graders at a Tennessee middle school. Students were given cards with terms generated from Yahoo!igans! and KidsClick!, two web directories designed for children. They were asked to sort the terms into three categories: general subjects, specific subjects, and most specific subjects; they were then asked to arrange the terms in tree structures. Finally, they were asked to draw concept maps based on these cards, indicating relationships between the concepts.

Bilal and Wang found that none of the children's maps were full matches for the Yahoo!igans! or KidsClick! hierarchies; they did, however, sometimes have partial matches in which a set of relationships the children identified was arranged the same way in the web directory structure, especially at the deeper levels of the hierarchy. Children's hierarchies were more similar both to each other and to the directories when dealing with concrete categories than when dealing with abstract categories, reflecting Cooper's findings (2004b). As they interviewed participants, Bilal and Wang found that most of the students' conceptual groupings were based on "perceptual, experiential, and situational relationships" rather than abstract reasoning (p. 1311).

In a similar study, Bar-Ilan and Belous (2007) used card-sorting and enveloping methods to explore children's conceptual structures of web directories covering leisure and entertainment topics. Groups of fourth- and fifth-graders in Israel were given 61 cards with topics drawn from the Yahoo!igans! and Walla web directory sections on leisure and entertainment. They were asked to sort these into categories and then name these categories, either by promoting one of the cards contained in the category to the status of the category title or by creating a new card to describe the category. Within these categories, participants were then asked to create subcategories by placing cards within envelopes to represent the subcategories and placing those envelopes within larger envelopes representing the larger categories.

Like Cooper (2004b) and Bilal and Wang (2005), Bar-Ilan and Belous (2007) found that children were better able to categorize concrete terms than abstract terms. They found that fifth-graders were better able to understand hierarchical structures than fourth-graders were. Bar-Ilan and Belous created a "consensus structure" that reflected all of the structures generated by the groups of children. Overall, they found that the children's structures closely resembled the original directory structures, although the original directory structures were slightly more complex.

Conclusion

Based on these studies, hierarchies designed for children are most effective when they are shallow and include top-level categories tailored to children's. As children develop, they move from a more personal, concrete understanding of information organization to a more socialized, abstract understanding. Information organization systems for children might be more effective if they are designed with children's varying cognitive capacities in mind.

Metadata Schemas

Controlled vocabularies and information hierarchies organize materials to facilitate access. It is not enough, however, to simply place resources in categories that will help children find them. Resource description can provide valuable information to children to help them determine whether a particular resource will meet their needs. Metadata schemas provide a structure for this resource description; in particular, they consist of well-defined elements that

describe particular qualities of a resource. Like the Dewey Decimal Classification system, commonly-used metadata schemas, such as the *Anglo-American Cataloging Rules, Second Edition* (AACR2) used by school and public libraries and the Dublin Core used to describe electronic resources, are designed primarily for adult use. Children select and evaluate resources based on certain characteristics that might not be included in these schemas (Beak & Olson, 2011a).

Children's Book Selection Considerations

One potential source for ideas of elements to include in a metadata schema designed for children's use is studies of children's book selection practices. Beak and Olson (Beak & Olson, 2011a) performed a meta-analysis of five studies of children's book selection practices (Kragler & Nolley, 1996; Moore, 1988; Pejtersen, 1986; Robinson, Larsen, Haupt, & Mohlman, 1997; Wendelin & Zinck, 1983). Based on this meta-analysis, they identified nine characteristics of books that children used to help them make selections. Additional studies confirm the potential value of including these characteristics as elements in a metadata schema intended for children's use.

Physical characteristics. Physical characteristics that might influence a child's choice of book include cover illustration and whether the book is a paperback or hardback (Kragler & Nolley, 1996; Moore, 1988; Pejtersen, 1986; Reuter, 2007; K. A. Reuter, 2007; Wendelin & Zinck, 1983).

Intellectual difficulty. Children prefer to read a "just right book" that is neither too difficult nor too easy. Strategies they might use to determine whether a book is of an appropriate difficulty include flipping through it, examining the vocabulary used in the book, and considering the book's length (Moore, 1988; Pejtersen, 1986; K. Reuter, 2007, 2007; Robinson et al., 1997).

Prior knowledge. Children select books based on their familiarity with characters in the books, the book's position in a beloved series, or because they are tie-ins to movies or television (Heninger, 2014; Kragler & Nolley, 1996; K. Reuter, 2007, 2007; Robinson et al., 1997).

Recommendations/awards. Kragler and Nolley (1996) found that students' top reason for selecting a book was that it had been recommended by a peer or teacher.

Topics. Children select books based on their personal interests or because of story content (Heninger, 2014; Kragler & Nolley, 1996; Pejtersen, 1986; K. Reuter, 2007, 2007).

Media connections. Children are likely to choose a book if it has been adapted to a movie or television show they enjoy (Kragler & Nolley, 1996; Wendelin & Zinck, 1983). Beak and Olson (2011a) draw a distinction between this and tie-ins mentioned under "prior knowledge."

Emotions. Children seek out books intended to provoke a particular emotional response (Heninger, 2014; Pejtersen, 1986; K. Reuter, 2007). Children might describe these books as "funny, exciting, adventurous, humorous, scary, sad, suspenseful, etc." (Beak & Olson, 2011a, p. 7).

Frame (time period, setting). Children might prefer to read about a certain time period, such as World War II, or a certain setting, such as a jungle (Pejtersen, 1986). This is not part of a book's main topic, but can still be a key factor in selection.

Genre. Children tend to prefer books of certain genres (K. Reuter, 2007, 2007; Robinson et al., 1997). For example, they might prefer non-fiction to fiction, or fantasy books to realistic books.

Evaluating Metadata Schemas for Children's Use

Based on the meta-analysis described above, Beak and Olson (2011a, 2011b) created a crosswalk, mapping these characteristics of children's book selections to the AACR2 and the metadata schema for the International Children's Digital Library. They found that the International Children's Digital Library schema accommodated more of the characteristics with specific elements than the AACR2 did. The AACR2 does provide for a "Note" area in records; characteristics of interest to children might be described in this space. Managing these characteristics in such a fashion might make this information less useful during information retrieval than it would be if it were contained in a dedicated element. Beak and Olson also reviewed Resource Description and Access (RDA), a new metadata schema intended to replace AACR2, but found that it had the same issues of lacking elements appropriate to describe resources for children.

Developing Metadata Schemas for Children's Use

According to Beak (2012, 2014), "there is no specialized metadata schema that describes children's resources that also is developed by children" (2014, p. ii). The International Children's Digital Library schema draws on research about how children select books, but children were not directly involved in the process of generating the schema (Druin, 2005). With her 2012 pilot study and 2014 dissertation, Beak set out to change this.

Resource-centered, user-centered, and user-driven schemas. Beak (2014) draws a distinction between resource-centered schemas, user-centered schemas, and user-driven schemas. Most knowledge organization systems in use in school and public libraries, such as the AACR2 and the Dewey Decimal Classification, focus on describing resources accurately without considering user perspectives; these are resource-centered schemas (Beak & Olson, 2011a, 2011b). A user-centered approach prioritizes user perspectives over technical issues related to resource description, but it does not rely on empirical data gathered from users to create the metadata schema. A user-driven approach, however, "requires empirical data from targeted end users" (Beak, 2014, p. 4). A child-driven metadata schema (CDM) must be informed by research on children's information-seeking behaviors and cognitive processes. Beak (2014) designed a child-driven metadata schema based on her own research and the research of others.

Cognitive and emotional factors and facets informing CDM. Using a triangulated qualitative research design that included questionnaires, think-aloud paired activities, and interviews, Beak (2014) observed the book selection behaviors of 22 children ages 6-9 in the Denver, Colorado area. Based on the transcription of videos and field notes recorded during library visits with the children, Beak identified cognitive facets and factors that might inform the development of a child-driven metadata schema. "Factors are referents often directly mentioned or pointed by participants or observable children's behaviors... On the other hand, facets emerge from these factors" (Beak, 2014, p. 74). By grouping related factors together, Beak was able to identify facets. There is significant overlap between these facets and the nine characteristics Beak and Olson (2011a) identified. The facets include basic bibliographic information, characters, difficulty, engaging elements such as interactive materials or textured illustrations, familiarity, genres, illustrations, novelty, physical characteristics, recommendations and awards, series or chapter books, stories and themes, and subjects. Each facet grew out of several factors mentioned by the children; for example, the facet of difficulty grew out of children's discussion of the number of words or pages in a book, a reading level indicator provided by the publisher, the title, or the vocabulary within the book.

In addition to identifying these facets and factors, Beak (2014) explored the role that emotional interest played in book selection by noticing when children used emotional vocabulary such as “like (don’t like), interesting, fun, cool, awesome, wow, happy, scary, etc.” (p. 120). Beak determined that “emotional vocabularies play a central role in the relationship among the children’s cognitive factors and facets” (p. 126). Pictures had the strongest relationship with children’s emotions, but other factors were connected with emotional vocabularies, including “book cover, title, subject, characters, plot, series, genre, etc... when participants perceived those factors, they experienced emotional states” (p. 126).

A child-driven metadata schema. Based on these findings, Beak (2014) developed a child-driven metadata schema based on the Dublin Core Metadata Initiative (DCMI). Beak named and defined five classes and thirty-three elements that grew out of her findings. The five classes are Story, which includes elements addressing issues of plot, setting, and subject; Character, which includes elements designed to describe a specific character; Illustration, which includes elements to describe both the content and format of a front book cover; Physical Characteristic, which includes elements addressing the shape and texture of the book; and Understandability, which includes elements concerned with length and reading level. Ten of the thirty-three elements were not assigned to a class. All thirteen of the facets from Beak’s findings were operationalized and included in the schema.

Beak’s intention with this study was not to create a “fully-functioning” child-driven metadata schema, but rather to improve “knowledge organization systems to better represent children’s perspectives.” Beak did not implement this metadata schema or perform empirical research to determine its effectiveness.

Conclusion

Children’s behaviors and strategies when selecting books can provide insight into what types of description might help them both locate and evaluate resources. Metadata schemas designed for adults do not include dedicated elements for many of the characteristics that children consider in book selection. The International Children’s Digital Library and Beak’s child-driven metadata schema provide a starting place for considering how to describe resources with children’s perspectives in mind.

Conclusion

Children have unique information needs and behaviors based on their developmental state. These unique needs require organization and description of resources that is child-driven, not adult-driven. Controlled vocabularies, information hierarchies, and metadata schemas all offer ways to meet these needs while keeping children’s perspectives in mind.

Controlled vocabularies generated for adults often include terms that are too sophisticated for children; they also often fail to address children’s interests. This can be mitigated by adding child-generated keywords derived from children’s search logs to controlled vocabularies. Hierarchies facilitate browsing, but adult-generated hierarchies are often too complex for children to use easily or aren’t relevant to children’s information needs. Children are capable of creating their own hierarchies. As they age, these hierarchies move from the concrete and simple to the abstract and detailed. While the hierarchies children create might be idiosyncratic, they are similar enough to provide insight into how best to design a hierarchy for their use. Metadata schemas can draw on children’s book selection behaviors to describe resources using elements that are not included in traditionally-used adult-oriented metadata schemas. Controlled vocabularies, hierarchies, and metadata schemes can be designed with children’s perspectives in mind, but determining their effectiveness requires further research.

The body of literature surrounding information organization for children is not robust. In particular, few studies evaluate the effectiveness of information organization systems designed for children. Future research in this area might examine how successful children are at using child-driven information organization systems such as Beak's metadata schema (2014). With the body of literature as it stands, the American Association of School Librarians would not be able to make a research-based recommendation for whether the Dewey Decimal Classification system, a genre-based system, or an entirely different system is most viable for organizing library materials, both physical and digital.

While this examination of the literature cannot provide a definitive answer to the Kansas Association of School Librarians Statement of Concern as to whether "ditching Dewey" is the best method of organizing and describing materials for children's use, it does offer several options for description and organization processes that take children's perspectives into account. As school and public librarians determine how best to organize their materials, they can evaluate their own communities' needs and consider this array of options to determine what suits their communities best. Across this entire body of literature, the theme of children as design partners emerges most strongly. Regardless of what method school and public librarians use to organize and describe materials, the children they serve should be included in the conversation.

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