



**Comparison of Metadata Schemas:
AACR2+ vs. ICDL's metadata schema**

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Abstract:

This study suggests the chance to reconsider the effectiveness of standard school library cataloging by comparing it with the International Children's Digital Library's (ICDL) metadata schema. The study uses a cross-walk method in order to compare two metadata schemas. The results explain how two metadata schemas describe unique characteristics of children's book choices. ICDL's metadata schema tends to reflect more children's unique information seeking behavior for book choices than standard library cataloging does. Standard library cataloging tends to describe children's unique information seeking behavior for book choices in a note area rather than describing in independent metadata elements.

1. Introduction

As children become a substantial user group in the digital environment, the need for children's libraries is also increasing. As a result, school libraries' OPAC systems, children's digital libraries, and children's web portals try to reflect children's unique information seeking behaviors. While previous studies focus on the development of child-friendly interfaces, few of these studies discuss a metadata schema for children's libraries. The purpose of child-friendly interfaces may be to help children's search techniques and eventually to meet children's satisfaction. Given that effective information retrieval is based on well-constructed information organization, we need more research on metadata schema for children's libraries.

School libraries are the most representative library for children. School libraries in the United States usually use the Anglo-American Cataloging Rules, 2nd Edition (AACR2), as a basic

metadata schema. In addition, standard library cataloging in school and public libraries usually use not only AACR2, but also other complementary cataloging and encoding standards such as MARC21, Library of Congress Subject Heading (LCSH), Dewey Decimal Classification (DDC), etc. In this study, “AACR2+” means metadata schemas used in school and public library cataloging, which includes AACR2 and other complementary cataloging and encoding standards such as MARC21, LCSH, DDC, etc. However, standard library cataloging, especially AACR2, is not created specifically for children and their collections. Given that children have different information seeking behaviors than adults, metadata schemas for standard library cataloging may need to be reconsidered in terms of how effective they are for a children’s library.

In comparison, the International Children’s Digital Library (ICDL) introduces a novel search interface. Its colorful and graphical search interface allows children to search by the colors of book covers, characters, ratings, feeling, genres, and so on. The factor that enables ICDL to provide child-friendly search interface is due to a new metadata schema. ICDL has its own metadata schema in order to respond well to children’s information seeking behaviors. The ICDL’s metadata schema can be considered as an application profile, which means it is based on Dublin Core (DC), General International Standard Bibliographic Description (ISBD), and AACR2. Therefore, ICDL’s metadata schema is sufficiently similar to AACR2+.

The purpose of this study is to evaluate the existing metadata schemas of standard library cataloging and ICDL’s metadata schema from the viewpoint of children’s information seeking behaviors for book choices. To identify the characteristics of a metadata schema appropriate for children’s libraries and how well they are represented in current schemas, this study will ask the following basic questions.

1. Can current metadata schemas be evaluated in light of children’s information seeking behaviors?
2. What does previous research indicate about the unique characteristics of children’s information seeking behaviors for book choices?
3. What metadata elements do ICDL and AACR2+ share in common?
4. Which metadata elements are different between ICDL and AACR2+?
5. *How do metadata elements relate to the unique characteristics of children’s information seeking behaviors for book choices in light of information retrieval?*

2. Scope

[Age] This study analyzes the appropriateness and effectiveness of the metadata schemas governing children’s materials, but does not directly interact with children. Given that young children and older children have different information seeking behaviors for book choices, the age of children may play an important role in creating a metadata schema. However, in reality, it is hard for school or public libraries to create and apply separate metadata schemas for different age groups. Therefore, in this study the research literature considered in the meta-analysis will address children ranging from early elementary school students to older elementary school students.

[Different nature of collection] Given the types of collections in ICDL and school libraries, the original characteristics of their metadata schemas may be different. ICDL’s metadata schema may be more effective for electronic books. On the other hand, standard library cataloging may

be more suitable for printed books. In addition, ICDL includes multi-lingual, multi-cultural, and multi-generational books, whereas school libraries typically include less diverse books. The difference in collections itself may require different metadata schemas. However, this study tries to limit the type of collection to books and focus on the characteristics of metadata elements related to children's information seeking behaviors for book choice rather than the characteristics of materials or collections.

[Contextualizing crosswalk] When metadata schemas are compared and evaluated, metadata elements are stressed more than the element's values such as controlled vocabularies, thesaurus, or LCSH, etc. For instance, the study will simply contextualize whether metadata elements match each other rather than scrutinizing what controlled vocabularies metadata schemas use. It is true that even though the same book is described, depending on users, the way to describe it will differ. For example, if genres are categorized by only three types for children such as picture books, concept books, or fantasy books, genre for adults can be categorized in more detail or by different controlled vocabularies. However, this study is to find whether metadata schemas have a 'Genres' element rather than how genres are described.

3. Methods

Methodology for this study consists of three parts: I. a meta-analysis, II. a crosswalk of the metadata schemas, and III. a comparison of the two data sets from part I. and II.

I. First of all, five research studies (Kragler and Nolley 1996, Moore 1988, Pejtersen 1986, Robinson et al. 1997, Wendelin and Zinck 1983) are consulted to compile the unique characteristics of children's information seeking behaviors for book choices. Unique characteristics of children's book choices are not found in basic bibliographical book information: title, author, publisher, year, editor, etc., although this information is used to select books by children. Therefore, to find out more unique characteristics of children's book choices, this study does not focus on basic bibliographical book information.

II. Second, the metadata schemas crosswalk will consist of links of the metadata schema element sets. The crosswalk will list elements for comparison in order to find which elements are common and different between the schemas. AACR's chapters 1, 2, and 21 are used and ICDL's metadata schema is obtained through the ICDL's website¹. However, the metadata schemas for the crosswalk are the ICDL's metadata schema and AACR2+. AACR2+ indicates metadata schemas for standard library cataloging: mainly AACR2 and other complementary cataloging standards. In other words, AACR2 will be compared as the dominant metadata schema. However, to contextualize standard library cataloging and ICDL's metadata schema, other complementary cataloging standards will also be considered.

Through a crosswalk, metadata elements can be divided into four categories: matched metadata elements, the metadata elements that are similar but not quite the same, the metadata elements found only in ICDL's metadata schema, and the metadata elements found in only standard library cataloging. The results of the crosswalk comparison are described in a table.

¹ <http://en.childrenslibrary.org/about/policies/metadata.shtml> (Accessed April 13, 2011)

III. Third, this study will compare the results of the meta-analysis with the results of the metadata schemas crosswalk in order to evaluate how the metadata elements correlate with the unique characteristics related to children’s information seeking behaviors for book choices.

4. Results

4.1. Meta-analysis

Through the meta-analysis, nine characteristics are identified: Physical characteristics, Intellectual difficulty, Prior knowledge, Recommendation, Topics, Media connection, Emotions, Frame, and Genre. The detailed results of the meta-analysis were presented at the third conference of the North American Society for Knowledge Organization (2011).²

4.2. Metadata Schemas Crosswalk

A crosswalk is a good method to examine which metadata elements are identical, similar, or different among metadata schemas. Standard library cataloging (AACR2+) and ICDL’s metadata schema are used for a crosswalk. The elements marked with * are not in the ICDL’s metadata specification, but they still play roles as metadata elements when books are retrieved. In addition, [MARC21] means that although AACR2 does not have elements matching ICDL’s metadata schema, the elements can be described in MARC21. Besides MARC21, there are also other complementary cataloging standards that accommodate with AACR2 in cataloging such as LCSH, DDC, etc. They cover some parts such as subjects, genres, classification number, etc. that AACR2 does not deal with. Again, this crosswalk focuses on the description of metadata schemas. Therefore, to contextualize two comparing objects of metadata schemas, standard library cataloging and ICDL’s metadata schema are compared. Especially, AACR2 and MARC21 are usually used as a descriptive metadata schema and as an encoding metadata schema in practices, it is true that the elements, which appear in MARC21, not in AACR2, cannot be ignored in this study. Table 1 shows the resulting crosswalk.

Table 1. Metadata Schemas Crosswalk

AACR2+		ICDL		Notes
Main Elements	Sub Elements	Sub Elements	Main Elements	
Title	Title	Title , Other Title	Title Information	
	Complementary Title	Alternative Title		
	Uniform Title	Alternative Title		
	Collective Title			
	Variant Title	Alternative Title, Other Title		

² Beak, Jihee and Olson, Hope A. (2011). Analysis of metadata schemas for children’s libraries. *Proceedings from NASKO 2011: Expanding Our Horizons, Evaluating Our Parameters. June 16-17, 2011. Toronto, Canada.*

AACR2+		ICDL		Notes
Main Elements	Sub Elements	Sub Elements	Main Elements	
Statement of Responsibility	Person, Corporate Body, Translators, Illustrators, etc.	Role(s): Author, Illustrator, Editor, Adaptor, Translator, etc.	Creator(s)	
Edition	Edition Statement	Edition Statement	Publication Information	
	Statements of Responsibility Relating to the Edition	Editor	Creator(s)	
	Statement Relating to a Named Revision of an Edition			
	Statements of Responsibility Relating to a Named Revision of an Edition			
Publication, Distribution, etc.	Place of Publication, Distribution, etc.	Publisher Location	Publication Information	
	Name of Publisher	Publisher(s) Name		
	Statement of Function of Publisher			
	Date of Publication	Publication Year Copyright Year		
	Place, Name and Date of Manufacture			
		Publisher URL		
Physical Description	Extent of Item The number of physical units		Physical Characteristics	
	Pagination	Page Count		
	Large Print			
	Illustrative Matter			
	Dimensions	Dimensions		
	Accompanying Material			
		Reading Direction		Left to Right or Right to Left
Series	Title Proper of Series	Series Title	Title Information	

AACR2+		ICDL		Notes	
Main Elements	Sub Elements	Sub Elements	Main Elements		
	Complementary Title of Series				
	Other Title Information of Series				
	Statements of Responsibility Relating to Series				
	ISSN of Series				
	Numbering within Series	Series Number/ Information	Title Information		
	Subseries				
	More than One Series Statement				
Note	Nature, Scope, or Artistic Form	Note	Note		
	Language of Item and/or Translation or Adaption	Book Language(s)	Language		
	Source of Title Proper				
	Variations in Title	Alternative Title	Title Information		
	Complementary Titles and Other Title Information	Alternative Title , Other Title			
	Statement of Responsibility				
	Edition and History				
	Publication, Distribution, etc.				
	Physical Description	Cover colors*	Others*		
		Length*			Long, Medium, or Short.
		Format*			Chapter books, Play(s), Short story, Picture books, Series, or Comic books.
		Shape*			Rectangle, Narrow, Square, Irregular, Wide, or Tiny.
	Accompanying Materials				

AACR2+		ICDL		Notes
Main Elements	Sub Elements	Sub Elements	Main Elements	
	Series			
	Dissertations			
	Other Formats			
	Numbers (not ISBN)	Other Number(s)	Identifying Numbers	
	Copying Being Described, Library's Holding, and Restriction on use			
	"With" Notes			
	Audience	Age Range	Abstract, Keywords, etc.	
	Summary	Abstract (Summary)		
	Contents	Subunits of Book		
		Reader Notes		
	<i>[MARC21: 6XX]</i>	Subjects and Keywords		
	<i>[MARC21: LitF]</i>	Type		Fiction or Nonfiction
	<i>[MARC21: 655]</i>	Genre		Action adventure, Classics, Concept books, Folk and fairy tales, Funny/humorous, Historical fiction, Mystery, etc.
	<i>[MARC21: 648, 650-subfield /y and /z, 651]</i>	Setting: When & Where		
	<i>[MARC21: 568]</i>	Award(s)		
		Rating*	Others*	Three star rating, Four star rating, Five star rating.
		Feeling*		Happy, Scared, Sad, Funny, etc.
		Characters*		Adults, Kids, Real animals, or Imaginary creatures

AACR2+		ICDL		Notes
Main Elements	Sub Elements	Sub Elements	Main Elements	
Standard Number and Terms of Availability	ISBN	ISBN	Identifying Numbers	
	Terms of Availability			
	Key-Title			
	Qualification			
	<i>[MARC21: 082, 080]</i>	Dewey Decimal Classification or Universal Dewey Classification Number	Identifying Numbers	
		Metadata language	Language	
Supplementary Items				
Items Made up of Several Types of Material				
Facsimiles, Photocopies, and Other Reproductions				

AACR2 tends to be more specific than ICDL's metadata schema, which may be because AACR2 addresses general books and other manifestations, but ICDL's metadata schema concentrates on children's books. Nevertheless, both have basic bibliographical data such as title, authors, edition, publishers, etc. In terms of Statement of Responsibility/ Creator(s), ICDL's metadata schema defines individual's role(s) in the statement of responsibility in detail. In other words, ICDL's metadata schema allows catalogers to select one of the roles such as author(s), illustrator(s), editor(s), etc., whereas AACR2 assumes that personal and corporate bodies cover generic individual's role(s) for books. AACR2 does not require, but does allow inclusion of roles. The roles of individuals, person(s) and corporate body can mean author(s), illustrator(s), editor(s), adaptor(s), translator(s), etc. According to the rule 1.1F8 in AACR2, catalogers can "add a word or short phrase to the statement of responsibility if the relationship between the title of the item and the person(s) or body (bodies) named in the statement is not clear." In this case, the role of individuals should be added in [square brackets]. The way to describe the statement of responsibility is different between AACR2 and ICDL's metadata schema. However, the fact that both have a metadata element for the statement of responsibility is common.

4.2.1. Elements only in ICDL's metadata schema

There are several elements that appear only in ICDL's metadata schema: Publisher URL, Reading direction, Subjects and keywords, Type, Genre, Setting, Award(s), DDC or Universal Dewey Classification (UDC) number, and Metadata language. However, it does not necessarily mean that standard library cataloging does not deal with them at all. For example, Subjects and keywords, Type, Genre, Setting, Award(s), and DDC or UDC number are controlled by other cataloging standards such as MARC21, LCSH, Sears, or DDC, while accommodating AACR2.

Reading direction “indicates whether the book is read left to right (such as in English books) or right to left (such as in books in Arabic).” This element is a sub-element under the Physical characteristics. Therefore, although there is no matching sub-element in AACR2+, it may be involved in the main element, Physical description in Note AACR2.

Given that the main element, Abstract and Keywords, etc., in ICDL’s metadata schema includes sub-elements in AACR2’s main element, Note, the following several sub-elements of ICDL’s metadata schema are considered sub-elements of Note in AACR2.

Subject and keywords do not appear in AACR2 because they are covered by different standards such as LCSH, Sears, DDC, but they are covered in ICDL’s metadata schema. Subject terms and keywords in the ICDL can be provided by contributors or users by adding tags for a book. However, these terms will be controlled by the ICDL’s own subject thesaurus. Although AACR2 does not have the element for subject or keywords, MARC21 has 6XX fields for subject access entries and terms of other subject heading lists and thesauri.

Type includes fiction books and non-fiction books.

Genre “describes the general style, form, or content of the book.” It ranges from Action adventure, Classics, Concept books, Folk and fairy tales, Funny/humorous, Historical fiction, Mystery, Plays, Poetry/rhyming books/songs, Scary/horror, Science fiction and fantasy to Short story collections. The element, Genre, is also not addressed in AACR2, but is now controlled by LCSH and MARC21 fixed field (LitF: Literary Form). MARC21 has a 655 field, Index term-Genre/Form. However, the definition of the 655 field, it does not mean exactly same as the Genre element in ICDL’s metadata schema. MARC21 defines “Genre terms for textual materials designate specific kinds of materials distinguished by the style or technique of their intellectual content (e.g., biographies, catechisms, essays, hymns or reviews).”

Setting requires information about “when and where the book takes places, not when the book was published or necessarily when the author lived.” Time periods are divided into six categories: Prehistory, Ancient history, 500-1500, 1501-1900, 1901+, or the Future. The subjects for a background setting can be specific or real places. In addition, the element also allows an imaginary place as a subject. For instance, Alice’s Adventures in Wonderland happens in an imaginary place. Therefore, this book can be found in “Subject > Places > Imaginary places.” These elements are not addressed in AACR2. However, they may be covered by LCSH. Also they may be accommodated in MARC21. There are the 648 field, subject added entry-chronological, sub-fields: |y Chronological subdivision and |z Geographical subdivision in 650 field, topical terms, or 651 field, geographical name for setting. However, they play roles as subject under 6XX field in MARC21. Therefore, it is hard to say that the setting element in ICDL’s metadata schema and the fields in MARC21 or LCSH are not coextensive.

Award(s) is information about the awards associated with a book. This element allows the name and year of award and a URL address for the award if it is available. MARC21 also has the field for awards in 586.

DDC or UDC numbers are identifying numbers. In MARC21, 080 field (DDC number) and 082 field (UDC number) can match with this element.

Metadata language means the English name of the language for cataloging. “This is the only field where English translation is required because [ICDL] need to know what language [contributors] are using [ICDL] so we can work with translators, if necessary.”

There are several elements that the ICDL uses as metadata elements, but does not explain in the metadata schema: Cover colors*, Length*, Format*, Shape*, Rating*, Feeling*, and Characters*. These elements are found by this study and added to Others* that this study decides to consider as a main element for them. When users search books with the advanced search function, they can see there is an Appearance category including Cover colors, Length, Format, and Shape. These sub-categories are about physical descriptions. However, they do not exactly match with the area, Physical description in AACR2. Therefore, these sub-categories are arranged in physical description as a sub-element in Note.

Cover colors* describe the colors in book covers. Dominant colors in book covers or objects’ dominant colors in book covers can be described in this element. As a result, children can search books by cover’s colors such as red, blue, or rainbow color.

Length* includes three types: long books, medium books, or short books.

Format* is not defined in ICDL’s metadata schema. However, the format plays a role as an element in the advanced search. According to sub-categories of the format, it includes chapter books, plays, short story, picture books, series, or comic books. It overlaps with genres, but because there is no definition of the format, this study cannot determine with a reasonable degree of certainty, the difference between format and genre.

Shape* describes the shape of books such as rectangle, narrow, square, irregular, wide, or tiny.

Rating* is not explained in ICDL’s metadata schema. However, it may be used as information like book reviews. This element enables readers to evaluate a book by rating on a scale of one to five stars.

Feeling* is also not explained in ICDL’s metadata schema. This element provides information about the set of emotions that children may feel after reading a book. For example, books may intend to make the reader feel happy, scared, sad, or amused after reading the books.

Characters* offer the information about objects in book covers. Characters do not have to be specified, but they need to be divided into adults, kids, real animals, or imaginary creatures.

4.3. How do the two metadata schemas describe unique characteristics of children’s book choices?

As the metadata- analysis does not include the bibliographical information as the characteristics of children’s book choice, there are no matching characteristics with the elements in the first four main elements of the crosswalk: Title, Statement of Responsibility / Creator(s), Edition, Publication Information. Moreover, there are difficulties in how Note is interpreted because of the nature of Note. In other words, it can include almost all information that does not fit into other elements. However, this study does not expand further on the usage of Note than AACR2 and ICDL’s metadata schema suggest. This study tries to evaluate how well existing description in metadata schemas for children’s libraries function in light of children’s information seeking behaviors for book choices. Therefore, regardless of the generous nature of Note, this study

focuses on whether or not the unique characteristics of children's book choices appear as discrete elements in metadata schemas. As the result, in this study, the characteristics of children's book choice, the type of book cover: hardback or paperback, is not described in Note. Of course, depending on librarians or libraries' policies, these characteristics can be provided in Note. Except for the one characteristic, the others appear in either AACR2+ or ICDL's metadata schema, or both. The following comparison will explain the results based on nine unique characteristics of children's books choices that found in meta-analysis.

[Physical Characteristics] The physical characteristics about a book cover's colors, characters, or objects may be provided in Physical description in Note in AACR2. Physical description in Note is for information about physical descriptions that does not fit into the main area, Physical description. Because Physical description in the main area deals with illustrative matters such as color illustration, maps, plans, etc., but not a book cover's colors, a book cover's colors may be described in Note. Even though Note can provide all of the relevant information, it is true that there are no suggestions in the rules for Note for characters or objects in book covers. Therefore, when children want to search books that have a yellow cat in a book cover, AACR2 cannot give information about this query. However, ICDL's metadata schema has metadata elements for cover colors and characters, allowing children to search the books by book cover's colors and characters. In addition, the information about size of print is provided in AACR2, not ICDL's metadata schema. However, As AACR2 says, when books are in large print for use by the visually impaired, the phrase, '(large print)', is supposed to state in Physical description. Therefore, the element for the size of print in AACR2 is also not for books that are printed large for children.

Table 1. Representation of unique characteristics of children’s book choices in two metadata schemas

Unique characteristics of children’s book choice		Metadata elements from crosswalk			
		AACR2+		ICDL’s metadata schema	
		Main Elements	Sub Elements	Sub Elements	Main Elements
Physical characteristics	Size of the print	X	X	X	X
	Hard / Paper cover	X	X	X	X
		X	X	Format*/Shape*	Others*
	Book cover’s color	Note	Physical description	Cover colors*	
Physical characteristics / Prior knowledge	Book cover’s characters or objects/ Particular characters	X	X	Characters*	
Prior knowledge	Series	Series	Title proper of series	Series title	
Intellectual difficulty		X	X	Length*	Others*
	# of pages or words	Physical description	Pagination	Page count	Physical characteristics
	Difficulty of words	Note	Summary	Abstract	Abstract, keywords, etc.
	Age appropriateness	Note	Audience	Age range	
Topics	[MARC21: 6XX]		Subject & Keywords		
	[MARC21: LitF]		Type		
Genres	[MARC21: 655]		Genre		
Frame	[MARC21: 648, 650 y z, 651]		Setting: When & Where		
Recommendation / Awards	[MARC21: 586]		Award		
	X	X	Rating*	Others*	
Emotions	X	X	Feeling*		
Media Connection	Uniform title [MARC21: X30, 6XX, 700 t]		X	X	

[Intellectual difficulty] Children tend to test how difficult or easy a book is when they select books. To judge the difficulty, they use several ways such as referring to the number of pages or age appropriateness, or reading beginning parts of a book or summaries. AACR2 and ICDL’s metadata schema provide the number of pages. In addition, ICDL’s metadata schema has one more element, Length*, for the difficulty. Because Length* is not defined in ICDL’s metadata schema, it is not clear whether the length is decided by the number of the page or other rules. However, by allowing children to limit the searching by the length such as long, medium, or short, children can judge the difficulty of books. Furthermore, AACR2 and ICDL’s metadata schema supply a book’s age appropriateness and summary or abstract. However, neither provides the beginning parts of books. A beginning part of books and summaries not only are different,

but also play different roles. Given that summary or abstract tends to be written by authors, reviewer, or librarians, it is unclear as to whether summaries are useful for children to judge the difficulty.

[Recommendation / Award] ICDL's metadata schema has Award(s) and Rating* elements. These elements can be used when children are looking for books that their peers, teachers, or family members recommend. Strictly speaking, although awards are a little bit different from recommendations, books receiving awards can be considered as recommendable books. Therefore when teachers, parents, or even librarians recommend books for their students or children, the information about awards is useful. Recommendations may also be associated with book ratings and reviews. ICDL's metadata schema permits children to rate a book on a scale of one to five stars. The more children like a book, the more stars a book has. Rating* element shows not only the number of stars, but also other information such as feelings or summaries from other readers. As above, the summaries from children's reviews may be more helpful than summaries by adults to judge the book's difficulty. However, AACR2 does not have metadata elements for awards or rating, although the information about awards can be recorded in MARC21. Therefore, children cannot search books by recommendation or rating of books by AACR2+.

[Topics] When children select books, their learning, social activities or interests influence book choices. Therefore the subjects should be described with children's views. It may require less hierarchical structures among subjects or easy controlled vocabularies. ICDL has not only a metadata element for subjects and keywords, but also its own subject thesaurus. In the case of AACR2, there are no elements for subject, but MARC21's 6XX fields are for subject access entries and terms from other subject heading lists and thesauri. Along with MARC21, LCSH, LCSH for Children's Literature, Sears, or Juvenile Subject Heading may be used in order to provide subject access points. Again, this study will not examine what kinds of subject headings or thesaurus AACR2 and ICDL's metadata schema use. However, the fact that AACR2 and ICDL's metadata schema have a metadata element for subjects or keywords is regarded as important.

[Media Connection] Children feel familiar with books associated with television shows, movies, etc. that they know. It implies the relationship among books and other forms of media. For example, a movie originates from a book, although the content of the movie may be a little or a lot different. If children can get the information that there is a relationship between two works, the information may motivate children to choose either the book or the movie. However, by using ICDL's metadata schema, the information about media connection cannot be provided. In case of AACR2, uniform title can function as a connection between manifestations. According to AACR2's rule 25.1.A.,

“Uniform titles can be used for different purposes. They provide the means:

- for bringing together all catalogue entries for a work when various manifestations (e.g., editions, translations) of it have appeared under various titles;
- for identifying a work when the title by which it is known differs from the title proper of the item being catalogued;

- for differentiating between two or more works published under identical titles proper;
- for organizing the file.”

In addition, current cataloging of media resources that are adapted or reproduced, based on original novels or stories, provides some connections as access points between original novels and media resources in X30 (Uniform titles), 6XX (Subject access fields) for characters, or 700 (Added entry-personal name) in MARC21. For instance, *Babe* is a movie produced by Universal Pictures. The movie is based on the book, *The sheep pig* by Dick King-Smith. In the bibliographical record for the movie, it can have the title, *The sheep pig*, in 130 or 730 field or in 700 field's subfield |t as an access point. Therefore, when children search the movie, *Babe*, they still can get access to the original book. Vice versa, although children do not know about the movie, when they search the book, the results will include bibliographical records about the movie. It may motivate children to choose either one of the works.

[Emotions] Children tend to express their information needs with the feelings that they may experience after reading books. For example, children may ask librarians to show “happy” books, which means they want to read books that make them feel happy after reading. This characteristic is significantly different than adults’ information seeking behaviors for book choices. The set of emotions is usually intended by the author. However, in AACR2, there are no elements to describe the information about the set of emotions. In contrast with AACR2, ICDL’s metadata schema has an element, Feeling*. Therefore, children can search books by emotions with ICDL’s metadata schemas.

[Frame] Children search books not only by subjects, but also by frame, which, according to Pejtersen (1986), is the background of content such as time, geographical, or social setting. ICDL’s metadata schema provides a Setting element, including time periods and the place(s) that the book takes places. Due to this element, children can limit their searching by six different time periods: Prehistory, Ancient history, 500-1500, 1501-1900, 1901+, or the Future, and the places such as continents, oceans, or imaginary places. Like Subjects, AACR2 does not deal with frame of a book’s contents. However, MARC21 and LCSH may correspond to the Setting element in ICDL’s metadata schema. In MARC21, there are 648 field, subject added entry-chronological; the sub-fields of fields in the 600-650 fields: |y Chronological subdivision and |z Geographical subdivision which are usually used for the corresponding LCSH subdivisions; or 651 field, geographical name for setting. There are also MARC fields to code geographic and chronological subjects (043: Geographic Area Code and 045: Time Period of Content) which could be used to limit searching. It is impossible to compare AACR2 to the ICDL’s metadata schema, it does not cover subjects, and is, therefore, outside of the scope of this study. There are no options in AACR2 to indicate frame information except free text notes.

[Genre] In addition, genre is also regarded as one of the unique criteria for children’s book choices. School libraries and children’s sessions in public libraries usually separate books by two general categories: fiction and non-fiction. ICDL’s metadata schema treats fiction and non-fiction as the type of books, and it also has a different metadata element for genre. The concept of genre in ICDL is differently interpreted. Children can browse searching by genre including action adventure, concept books, folk and fairy tales, etc. On the contrary, AACR2 does not embody a metadata element for genre, but MARC21, LCSH, or Library Congress’s Genre and

Form heading assist with genre. However, the definition of genre in MARC21 seems to not be suitable for children's libraries. "[...] A genre term designates the style or technique of the intellectual content of textual materials or, for graphic materials, aspects such as vantage point, intended purpose, characteristics of the creator, publication status, or method of representation. [...] Examples of genre terms for textual materials are: biographies, catechisms, essays, hymns, or reviews." Also, because genre plays a role as a subject in MARC21, it is hard to distinguish among subjects, genres, and type of books.

[Prior Knowledge] Children are apt to select books when they are familiar with the books because of particular character(s) in the books or series, particular series, other media connections like television shows or movies, recommendation or awards. Most of the factors that cause familiarity have already been mentioned in previous metadata elements. In terms of series, AACR2 and ICDL's metadata schema have a metadata element for series title. However, sometimes children refer differently to a series title from the exact series title. In particular, if a series title has a particular character's name, children may remember only the name of the character, instead of remembering a whole series title. For example, *The Adventures of Benny and Watch* is one well-known children's series. However, children may try to search books with only one character's name, like Benny or Watch, because characters' names are more familiar to them. Like this example, if books or series have particular character(s), the names of the characters play a significant role as access points to search for books. Therefore, metadata schemas need to not only provide series title, but also have a separated metadata element for character's name(s). AACR2 and ICDL's metadata schema have a metadata element for series title, but not for character's names, although fictional names like Mickey Mouse (Fictitious character) may be used as subject headings in LCSH.

5. Conclusion

In general, the study has found that ICDL's metadata schema has more effective metadata elements than standard library cataloging to describe children's collections in light of children's information seeking behaviors. By having more metadata elements related to the unique characteristics of children's book choices, ICDL's metadata schema provides more access points. In addition, considering the relationship between information organization and information retrieval, the information that is described in a note, not in an independent metadata element may have a different impact on information retrieval. Due to discreet metadata elements, ICDL's metadata schema is more effective in a browse search system. By using keyword searching, information in a note can be found. Nevertheless, as the literature review about children's searching behaviors shows, browse searching is more effective for them. This implies that separated metadata elements function as diverse access points based on unique characteristics of children's book choices. In other words, if information such as rating, emotions, or characters is described in separated metadata elements, children can limit searching (field search or category search) books by these elements. It may not only offer more access points in the browse searching, but also increase the precision of the results.

However, ICDL's metadata schema also does not cover all unique characteristics of children's book choices. In addition, although ICDL's metadata schema has more elements for unique characteristics of children's book choices, it does not mean that elements function well enough to represent children's information needs. For examples, although ICDL's metadata schema has a Characters* element, it limits by objects of characters such as animals, kids, or adults. It does not

identify the character's names. These facts suggest that metadata schema needs to provide more searchable elements for information related to characters.

While focusing on metadata elements rather than the value of them, the study suggests a similar study of the more complex area of subject representation. AACR2 coordinates with other standards like LCSH, LCSH for Children's Literature, or Sears in order to describe subjects, genres, or forms. The ICDL has its own subject thesaurus and controlled vocabularies. However, this study has considered them only at the structural level. Therefore, future studies may require evaluating the contents of the metadata elements related to subjects, genres, etc.

In conclusion, in terms of the relationship of metadata schemas and information retrieval systems, ICDL's metadata schema seems to allow the information retrieval system to function effectively for children. However, the findings of the study have not been ratified in a real environment. Therefore, to confirm the findings, direct research with children comparing the effectiveness of the two schemas in a real environment would be required. This study points to the variables that would be starting point for such ongoing research.

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