2016-06-01

A Look at the Reliability of an Early Childhood Expository Comprehension Measure

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A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Arts

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June 2016

ABSTRACT

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Although the implementation of the Common Core State Standards has included more informational texts in early grades to emphasize reading to gain knowledge (Green, 2012; Roskos & Neuman, 2014), the lack of available expository assessments leaves teachers unsure of what students need to know in order to be successful comprehenders of these texts (Hall, Markham, & Culatta, 2005; Harding, 2014). Moreover, there are very few early expository assessments available which makes it difficult for teachers to monitor young children's expository text knowledge and skills and then adjust their instruction to meet children's unique needs. The EECA R-2 is an early expository assessment measure that was created in order to meet these demands. Data from 128 preschoolers between the ages of four and five in seven different Title I classrooms were collected to determine the reliability and validity of the EECA R-2. Children were given the Test of Story Comprehension (TSC) subtest of the Narrative Language Measures (NLM) Preschool Assessment as well as two versions of the EECA R-2. A Many Facets Rasch model was used to determine reliability and to allow for examination of individual test items. In addition, correlations were run between the NLM and the EECA to determine the validity of the EECA. Results indicate the EECA R-2 is a reliable and valid measure. High reliability was obtained for all facets (rater .00, person .97, and form .96). Items 6-13, 15, 18, and 23 were deemed quality items. Items 1, 2, 5, 15, 16, 20, 21, 25, and 26 were deemed problematic items. There was a positive correlation between the TSC subtest of the NLM Preschool Assessment and the EECA R-2 tasks ($r=.76$, $p=\leq.01$). Future research could include another rendition of the EECA in order to gain a better understanding of the problematic items. Doing so could support teachers in assessing student abilities and preparing classroom instruction that targets specific areas of focus to move learning to higher levels.

Keywords: comprehension assessment, expository text, preschool

ACKNOWLEDGEMENTS

Thank you to my wonderful chair, Dr. Kendra Hall-Kenyon for all of her dedication, and patience and positivity as she supported me through this process. Thank you also to my committee members Dr. Barbara Culatta and Dr. Stefinee Pinnegar for their additional encouragement and support. I would also like to thank my family, especially my husband for their continual encouragement, kind words, and help throughout my studies.

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Chapter 1:

Introduction

In the U.S., the implementation of the Common Core State Standards has reemphasized a rigorous reading curriculum that fosters comprehension and critical thinking, with an eye to college and career readiness (Green, 2012; Roskos & Neuman, 2014). One of the most notable additions to the core standards is the recommendation for teachers to include a 50/50 mix of narrative and informational texts during instruction (Duke, 2000; Neuman & Roskos, 2012). The inclusion of more expository texts naturally supports reading to gain knowledge, placing a higher emphasis on both literacy and content (Green, 2012). Common core standards build upon one another from grade to grade, extending increasing responsibility to students each year as their understanding of content continually increases. Giving students additional opportunities to read and learn from expository texts in the early years may support students as they are asked to focus more and more on reading for information (Neuman, 2014; Neuman & Roskos, 2012). Thus, early childhood educators must set the foundation for success through literacy instruction that supports expository text comprehension strategies to build and support children's academic knowledge.

Early exposure to expository texts and their unique content features may help support students' future success in many ways. First, learning from expository texts can enhance student learning of other content areas such as science and social studies (Neuman, 2014; Shanahan & Shanahan, 2014). In addition, the expectation to learn from expository texts increases and expository texts become more complex in middle grades (Masoumeh, 2011). Students who have had more exposure to these texts early on could gain important foundational knowledge related to content area material and may be better prepared to learn new content from the other, more complex texts they will read in upper grades (Shanahan & Shanahan, 2014).

Second, learning to gain new information from expository texts can help students begin to recognize the unique characteristics of expository texts which will ultimately support their comprehension and acquisition of academic knowledge (Hall, Sabey, & McClellan, 2005). Unlike narrative texts, expository texts have many different organizational structures depending on the purpose of the text and the content that is being presented. These texts also include unique additional features such as graphics, tables, charts and figures that can further support comprehension if students know how to read them. In older grades students are asked to use their knowledge of structure as well as text features to organize their thinking as they read. Implementing instruction in early grades to help students learn to extract knowledge from informational text may support their learning later on (Masoumeh, 2011; Meyer & Freedle, 1984; Meyer et al., 2002).

Third, learning from expository texts can support young students' knowledge of academic vocabulary (Gardner, 2004; Price, Kleeck, & Huberty, 2009). As students read expository texts related to a specialized area of study, they are exposed to technical vocabulary related to the subject matter again and again, increasing a child's ability to hold on to the meaning of these words (Gardner, 2004). Thus exposing students to expository texts in younger grades increases their vocabulary knowledge relevant to many different content areas and supports their overall comprehension of these subjects in older grades.

Statement of the Problem

Currently teachers have assessment tools that can help them evaluate students understanding of narrative texts. However, even with the increased emphasis on expository texts in early grades, teachers lack tools that appropriately assess young students' ability to comprehend informational texts. This makes it difficult for many teachers to know how to guide

young students in their acquisition of the skills they need to learn and gain meaning from expository texts. Without a reliable and valid measurement tool that shows teachers what students know, they cannot create lessons that will push students forward and help them become better readers. This can leave teachers unsure of exactly what expository skills to teach (Hall, Markham, & Culatta, 2005; Harding, 2014).

Although some comprehension assessments exist for children in grades K-3, little research has been done to aid early childhood educators (prek-2) in assessing their students understanding of expository texts and thus guide their instruction (Williams et al., 2005). In 2005, a study by Hall, Markham, and Culatta focused on the creation of a reliable expository text assessment for preschool. A compare/contrast text structure was used for the assessment. Although the results from this initial study suggested the Early Expository Comprehension Assessment (EECA) was a reliable tool, an expanded version was needed to more fully explore a child's overall comprehension and to increase usability by adding additional text structures.

In a follow up study in 2014 by Harding, the EECA was revised and entitled the Early Expository Comprehension Assessment-Revised (EECA-R) and included a problem/solution as well as a compare/contrast text structure. More general expository tasks were also included such as a request to identify the purpose of the text, and match pictures to text. Harding found the *EECA-R* tasks to be reliable using problem/solution text structure.

Purpose of the Study

The purpose of this study is twofold: (a) to test the reliability of the EECA R-2 with the addition of the sequencing structure and (b) to test the validity of the EECA R-2.

Chapter 2:

Review of Literature

In order to better prepare students for career and college readiness, there has been an increased focus to including deeper readings of texts that can support students in gaining higher levels of comprehension and academic knowledge (Green, 2012; Roskos & Neuman, 2013). Students are expected to focus on reading for understanding (p. 380). This implies that students should be using comprehension skills and strategies to critically think about and analyze texts. This increases a student's chances of connecting the new information they read to information they already know, allowing them to remember it long term (Conner et al., 2014; Kintsch & Kintsch, 2005).

As students move up into older grades they engage in varied ways of thinking, reasoning, and discussing texts from different disciplines including math, science, and social studies. More sophisticated texts such as these are more likely to use structures other than narrative ones. Shanahan and Shanahan (2004) describe the difference present among disciplines when they explain the following:

> Since historical accounts are always contestable, historians read everything critically. Scientists read critically too, but they do it differently. Uncovering author bias isn't as central to the reading of experiments as is an analysis of the adequacy of a study's methods and instrumentation (p. 637.)

Thus, in social studies, students must know how to examine texts for different perspectives and biases, whereas a student in a science class may focus more on analyzing the text for rigor and precision (Shanahan & Shanahan, 2004). These different expectations require students to know how to navigate through a text, use text features to locate information and read a text for different purposes to construct meaning. If we expect students to do this, they likely need an

early foundation that will support them in developing the many skills necessary to successfully navigate and learn through expository texts.

Expository Texts in Early Reading Instruction

Students are primarily exposed to narrative texts as they are learning to read. The structure of this type of text is predictable and consistent and the content is generally relatable to children's lived experience. Familiar organization, accessible content, and increased exposure support students in their knowledge of how to understand these narrative texts they read (Duke & Kays, 1998; Paris & Paris, 2011).

In contrast, many students do not have adequate exposure to expository texts until the middle elementary grades. Unlike narrative texts, expository texts have varied text structures depending on the type of information being relayed in the text and can often times be very dense and difficult to understand (Duke & Kays, 1998; Hall et al., 2005; Moss, 1997; Pappas, 1991; Witmer, Duke, Bilman, & Bets, 2014). Thus, students cannot rely solely on narrative skills to comprehend expository texts and must instead become familiar with the unique skills and strategies needed to learn from and comprehend what this new discourse demands.

Specific Skills and Strategies Needed to Comprehend Expository Texts

Some skills and strategies that readers must be aware of include the use of text features, understanding text purpose, locating the main idea and key details in a text, identifying text structure, asking and answering questions while reading and making connections among ideas and experiences (Burton, 2008; Guillaume, 1998). For the purpose of this paper, a few of these skills and strategies will be outlined below including understanding text purpose, utilizing text features, and developing an awareness of text structure.

Identifying the purpose of the text. The purpose of expository texts is to teach and relay information about a topic. These texts inform readers about content area knowledge and help support readers in authentic learning that relates to the world around them (Harding, 2014). Because readers primary purpose in reading expository texts is to learn, students must go into reading with an understanding of how to best locate the information they need and know how to process and understand the information presented to them. When students are given a purpose for their reading, they understand that they are reading to learn more about the world and are better able to follow through with the goals that they set before reading (Guillaume, 1998).

Use of text features. Another skill that students need to know is how to use text features to gain information. Features include the table of contents, headings, a glossary, an index, and graphics. These features help students navigate their way through a text and provide support in locating specific information as they read. The table of contents located in the front of the book helps organize the information that will be relayed and allows students to selectively turn to the section of information they need to read. Headings indicate what the main idea of the section will be. A glossary provides definitions of challenging vocabulary words that are present throughout the text. An index gives a list of keywords that tell you which pages the words are located on. Graphics help support information that is relayed in the text to further explain key ideas. According to Norman (2010), graphics help to extend information, give representations to help explain the abstract, and support the interpretation of ideas presented in a text. Graphics can be especially helpful in supporting young children's comprehension as they appear in most children's books and can support early readers understanding of the information presented in a text.

Awareness of text structure. One skill that students could attend to in younger years that may support them in older grades is having an awareness of text structure. Meyer, Brandt, and Bluth (1980) stated that "The structure of a text specifies the logical connections among ideas in a text as well as subordination of some ideas to others" (p. 74). In other words, text structure is how a text is organized or how the ideas are connected to support overall meaning (Hall et al., 2005). It is important for readers to be aware of text structure because it allows them to understand relationships among ideas in a text.

As stated previously, narrative texts follow a common structure (i.e., a story structure that consists of characters, setting, problem, solution, outcome) while expository texts can have many different structures (Masoumeh, 2011). Within each text structure, organizational patterns are indicated through words that help readers organize information as they read (Burton, 2008; Englert & Heibert, 1984; Harding, 2014; Mcgee, 1982; Westby, Culatta, & Hall-Kenyon, 2014; Williams et al., 2005). Three expository structures that will be focused on for the purpose of this paper include sequencing, problem/solution, and compare/contrast.

Sequencing is used primarily to relay a series of instructions or events that have happened. A text explaining how to fix a tire, or a text outlining the events of WWII could have a sequencing structure. A text describing lifecycles could also have a sequencing structure in order to describe the sequence of events that occur as a seed grows into an adult plant. Common indicators would include the words *'first, next, then, last.'* These words help clarify which events happened in which order and support the reader in organizing and remembering when each event occurred (Englert & Heibert, 1984).

In a problem and solution structure, a problem is explained followed by a solution to the problem. Indicators could include words such as *'problem, solution, question, answer, if,* and

then.' A text explaining the importance of not littering could start out by expressing the problems that are occurring due to littering and end with how to fix these problems. Readers who recognize this structure while reading are guided to the most important pieces of information through the problems and the solutions that are outlined

In a compare and contrast structure, ideas or information are compared or contrasted with other pieces of information. For example, a book about big cats might compare and contrast the differences between different types of cats to one another. Key words could include *'similarly, in contrast, if, then,* or *but'* (Englert & Heibert, 1984). Table 1 briefly defines each of these structures, including some key words and phrases associated with each structure and an example.

All of these strategies can be utilized to help a reader make sense of a text. The following is an example of how a student might implement these strategies while reading. The book Making Pizza by Rebecca Sandies (readinga-z.com) is an expository text that explains the steps you go through to make pizza. A child reading this text could use their knowledge of sequencing, text purpose, and text features to better understand what they read. The signal words used throughout the book could help the reader identify this text as having a sequencing structure. Using text features such as the graphics would support the reader in understanding the steps explained through the use of pictures, which could add to the student's overall comprehension. Thinking about learning the steps to make a pizza as the purpose of the text would also support the reader in their overall understanding. Teachers who have a good understanding of these skills and strategies and have a way to assess children's abilities of these skills can support students as they read to critically think and learn from these texts as they employ the strategies listed above (Neuman & Roskos, 2012).

Table 1

Different Types of Expository Text Structures

	Definition	Key words and phrases	Content area example
Sequencing	Author lists events in sequential order	First, next, then, after that, last	Life cycle of plants and animals
Problem/Solution	Author describes a problem followed by a solution to the problem	Problem is, if so, because, question, answer	Responsibility of community helpers
Compare/Contrast	Author describes the similarities and differences between several things or ideas	Similarly, in contrast, however, on the other hand, different, alike	Animal characteristics

Need for Expository Text Comprehension Assessment Tools

Witmer, Duke, Bilman, and Bets (2014) described the need for educators to teach students the specific structures (described above) and text features that students need to become good comprehenders. Because there are so many strategies and skills that students must use to successfully engage with and understand expository texts, teachers need a valid assessment tool that will allow them to see how their students interact with and comprehend expository texts.

Although some comprehension assessments exist in early grades, there is a limited amount of assessments available for the use of early childhood educators (Harding, 2014). This study aims to create an assessment tool for early preschool teachers that will not only gauge a student's overall comprehension of expository texts, but their understanding of specific comprehension skills such as text structure, text features, identifying the purpose of the text, and retelling ability.

Some comprehension assessments that are used in early grades include The Dynamic Indicators of Basic Early Literacy Assessment, The Qualitative Reading Inventory 4, and The

Concepts of Comprehension Assessment. These assessments are outlined in more detail below to better understand what is currently available to teachers and how the EECA R-2 might contribute to the identification of specific comprehension skills for expository texts.

The Dynamic Indicators of Basic Early Literacy Assessment is a common assessment used among teachers in grades K-3. This test focuses mostly on a student's phonics skills and fluency while reading. Although there is one section of the test related to comprehension, it only examines how long a student takes to retell a text and does not focus in on any of the important components related to a child's overall understanding of what was read (Shelton, Altwerger, & Jordan, 2009).

Other tests created for the assessment of students' comprehension skills do not focus on the specific strategies and structural knowledge that students possess. For example, The Qualitative Reading Inventory 4 (Leslie & Caldwell, 2006) focuses on whether or not students can retell what they have read. This assessment was created for grades 1-12 and uses a child's ability to read in assessing both narrative and expository texts. Although students are asked to retell passages and are asked comprehension questions about what they have read, this test doesn't focus on specific strategies or skills that children use to understand a text, particularly informational ones.

One assessment, The Concepts of Comprehension Assessment, was created to measure and analyze specific comprehension strategies students use as they read expository passages. This assessment was created for first-and second-grade students (Harding, 2014; Witmer et al., 2014). In one section of the test, a teacher reads aloud an expository passage and the student is asked questions that relate to what is happening in the text. A child might have to match up a picture with the most important information learned or recall what they just read. This test gives

teachers a detailed understanding of how children are using strategies and skills to comprehend and pull information from what they are reading but it was only created for first grade and above (Harding, 2014).

Although a few assessments exist to analyze students understanding of expository texts in younger grades, there are still no valid assessment tools that have been created for the use of Kindergarten and Preschool teachers (Hall, Markham, & Culatta, 2005; Harding, 2014). In 2005 the EECA measure (Hall et al., 2005) was created to assess preschool students' comprehension of expository texts. It included a compare and contrast text structure and asked students to use manipulatives to explain how text events were similar and different. Three response tasks were used included mapping, retelling and comparing. Results from this study showed the EECA to be a reliable assessment tool (Hall et al., 2005).

In a 2014 follow up study, the EECA-R was created (Harding, 2014). This measure included a problem/solution text structure to test the reliability of more than one structure and also added a more diverse population of participants. This study also included other important comprehension strategies and skills such as identifying a text's purpose and using pictures to see how students were able to use these skills to understand the texts they read. Results found the EECA-R to be a reliable assessment tool.

The current study adds to the development of the EECA by adding the sequencing structure and by testing the validity of the tool. Because it is important for students to have a strong understanding of multiple structures, adding the sequencing structure will allow teachers to have access to their students understanding of multiple expository text structures. This study also adds a digital component to the EECA. Results from the previous study found that the visual representations used were often difficult to represent (figures were used to represent events

occurring in the text) and may have been misinterpreted by students. Administrators read the expository text, while representing the ideas with props and pictures, which also resulted in some undesirable variation in the administration procedures. Therefore, the EECA R-2 was administered on an iPad, which allowed for the use of more complex graphics/images and also helped standardize assessment administration. The children listened to instructions, text and questions from pre-recorded audio, that played as the children were shown corresponding pictures and graphics. Assessors sat next to participants to record answers and clarify confusion when necessary.

Summary

Comprehending expository texts is a vital skill that students need in order to be successful readers and writers. The rigor of Common Core State Standards and high expectations for students to be college and career ready has increased the demand for the inclusion of expository text instruction in early grades (Conner et al., 2014; Duke & Block, 2012; Hall et al., 2005; Hall et al., 2005; Roskos & Neuman, 2013). Due to the lack of reliable and valid expository texts that exist for early childhood educators, an expository assessment is needed that will identify young learners' comprehension skills utilized to make sense of these texts. Therefore, the purpose of this study is to test the reliability of the EECA R-2 while adding a sequencing text structure and to test the validity of the EECA R-2.

Chapter 3:

Methodology

Participants

Children from seven Title I preschool classrooms within a large suburban school district in the western United States and two classrooms from a university lab school participated in this study. Students were between the ages of three and five years. Some participants were English Language Learners, although only students with sufficient English language abilities (based on teacher judgment) participated. The total count of participants was 128.

Measures

Narrative Language Measures. Participants were given the Test of Story Comprehension (TSC) subtest of the Narrative Language Measures (NLM) Preschool Assessment. The TSC subtest consists of two short narrative passages that are read aloud followed by specific questions that are asked related to the structure of each passage (e.g., Who was this story about? What was his/her problem? What did he/she do to fix the problem? What happened at the end of the story?). This subtest was used because the questions focus on the narrative structure of the text rather than a narrative retelling and are therefore similar to the questions utilized on the EECA R-2. Furthermore, narrative structure has some overlap with two of the expository structures used on the EECA R-2 (sequencing and problem/solution). As a result, the format and focus of the TSC subtest were a good fit for the EECA R-2. It should be noted however, that it would have been preferable to have an expository comprehension assessment to test validity. Because there are currently no expository comprehension assessments available for preschool children, the TSC subtest of the NLM Preschool Assessment was the best assessment option available to determine validity. Nevertheless, caution should be taken in determining construct validity.

EECA R-2. The original EECA measure was created to examine preschool children's ability to comprehend compare/contrast texts (Hall, Markham, & Culatta, 2005). The measure was expanded to include problem/solution texts and then retested for reliability (Harding, 2014). The current study will again expand the EECA by including a sequencing text and also testing for the validity of the measure. The EECA R-2 was also digitized to help ensure consistency in test administration and allow for greater use of pictures and other visual tools to enhance the assessment.

The EECA R-2 consisted of 27 total items and included the following tasks: identifying the purpose, identifying graphics, labeling, retelling, mapping, and sequencing. Below, each of the test items is explained in detail (see Appendix A and B for version A and B protocol).

Identifying the purpose (items 1 and 2). Students were shown book covers for an expository text about giraffes and a narrative text about giraffes. They were asked to identify the book they would read if they wanted to read a make believe story about giraffes and asked to explain how they knew the book they chose was a made up story. They were then asked to identify the book they would read if they wanted to learn real information about giraffes and were asked to explain how they knew this book would tell them real information.

Graphics (items 3, 4, and 5). Students were read a portion of the expository book about giraffes and asked to match a picture to the part of the text that was just read to them for two pages of the text.

Labeling (items 6 through 12). Students were shown a picture from the giraffe text labeling different parts of the giraffe's body. Students were then asked to point to a specific label indicating a part of the giraffe's body.

Retelling (items 23 and 24). After reading a book with a sequencing text structure (How We Get Beans or How Frogs Grow) students were asked to retell what they read (e.g., Can you tell me what happened in the story?) An open retell was used to gauge the students understanding of relevant information related to sequencing.

Mapping (items 25 and 26). Students were asked to move pictures from the text onto an organizer that was specific to sequencing (e.g., I will ask you a question, you choose the picture that shows the answer and move it to the correct box.) The organizer consisted of a two-column chart that said 1st, 2nd, 3rd, and 4th along the side. Students were asked to move pictures onto the chart in the order of when they occurred in the text (e.g., What happens first for us to get beans?). The organizer was filled out by dragging pictures onto the chart for what happened 1st, 2nd, 3rd and 4th in the text.

Structure questions (item 27). Students were asked questions related to the order of events that exist in the text. Questions included the following: What happened first? What happened next? What happened last?

Procedures

Permission from the university Institutional Review Board (IRB) and participating school district was obtained prior to data collection. Once permission was granted, teachers were recruited through email. Teachers then sent home parent consent forms for parents to sign indicating that the data collected from subject participation could be used in this study.

Pilot testing. A pilot test of the digitized version of the EECA R-2 was administered to children in order to determine if refinements needed to be made to any of the tasks before administration. Two examiners administered the assessment to two children each. After the pilot, changes were made to the protocol in order to clarify questions and procedures.

Examiner training. Administrators were trained on the administration of the TSC subtest of the NLM preschool assessment and the EECA by a BYU faculty member. They were then given scripted prompts for each of the test components and practiced in pairs. Once they were familiar with the assessment procedures, they gave the assessment to pilot participants, these data were not included in the study.

Administration and data collection. After the pilot test and examiner training was completed, study participants were assessed three times, each lasting 15-20 minutes. During the first assessment session, the TSC subtest of the NLM preschool assessment was administered. We used this to test the validity of the EECA R-2 measure. During the second and third assessment sessions, two versions of the EECA R-2 (version A and version B) were given to each student to ensure the reliability of the measure. Students were randomly selected and rotated through eight possible administration combinations (see Table 2). By following Table 2 the administration of the tasks were systematized to include all combinations of version and examiner with randomized assignment. Prior to data collection all possible examiner and version order combinations were delineated.

Administration procedures. The assessment was digitized and administered on iPads. Students were shown each section of the test by the administrator. As each section played on the iPad, students were asked to respond to questions by pointing to the iPad screen. Following each section, administrators asked students to retell what they had just learned and then were asked to move pictures onto an organizer to show their understanding of text structure. All student answers were manually recorded on a student recording sheet as the test was being administered. Scripted prompts were given to all test administrators to ensure that every student was being assessed in the same way.

Table 2

Administration Orders

Possibilities	First		Second	
	Version	Examiner	Version	Examiner
1	A	1	B	2
2	A	1	B	1
3	A	2	B	1
4	A	2	B	2
5	B	1	A	2
6	B	1	A	1
7	B	2	A	1
8	B	2	A	2

Test administrators were put in pairs. As the assessment was being given to the student by one administrator, the other administrator audio recorded and watched to ensure the assessment was being given the same way to each student. The examiners and co-examiners administered all of the tests in order to control examiner effect. Ten percent of these assessments were video recorded and analyzed by an outside source to make sure tests were being given in the same way among administrators, giving feedback to the administrators to ensure uniformity and understanding of the protocol.

Scoring procedures. All assessments were audio recorded to ensure that vague or lengthy responses on the measure were recorded correctly. Then, participant sample responses were used to create a scoring protocol for the EECA R-2. Sample items and the scoring protocols were used to practice scoring, and make adjustments where needed. A faculty member, another

graduate student and the author scored the sample items individually and then discussed what changes should be made to the test protocols. Adjustments were made to the retelling scoring, where a four-point scale was used according to participant responses to allow for more consistency among scoring procedures. After this initial meeting, a faculty member, another graduate student, and the author met with eight undergrad students to train them on the scoring of the EECA measures. Each examiner was given EECA version A sample items and were asked to score these items using the test protocols. We discussed our answers and came to a consensus for each item where there was variance to come to a consensus. Following this meeting, examiners were asked to take home two version A sample items and score them individually. Examiners then attended a follow up meeting with a graduate student to discuss any variance in scoring. This same process was repeated for two version B sample items to ensure inter-examiner reliability among scorers. Changes were made to the test protocols throughout the training process, including possible participant answers and scores that were given based on the discussion at each training session. After the training was complete, all version A tests were divided among the eight examiners according to the scoring design. Upon the completion of this scoring, all version A tests were resorted and rescored according to the scoring design. This process was repeated for all version B tests. The author and a faculty member reviewed and discussed the scoring of the TSC subtest of the NLM preschool assessment. The author then followed the published scoring guidelines.

Data Analysis

Reliability of the EECA R-2. A many-facet partial credit Rasch model was used to estimate the reliability of the EECA R-2 ratings. A brief explanation of the basic Rasch model

and the partial credit model are included, followed by an explanation of the many-facet partial credit Rasch model (the model that we used) because the three models build on one another.

The basic Rasch model is a probabilistic model in which the probability of a correct response to an item is a function of the difference between person ability and the item difficulty. Each person is assigned an ability estimate, and each item is assigned a difficulty estimate. The basic Rasch model can only be used for dichotomous items (items with two possible responses, only one being correct.)

Because the EECA R-*2* has both dichotomous and non-uniform polytomous items the basic Rasch model is insufficient. The partial-credit Rasch model adds a threshold parameter which is the point at which a student has an equal chance of obtaining that score (k) and the adjacent score (k-1). This model can be used for polytomous items (items with partial credit answers.) Figure 1 indicates the difference between what a dichotomous item looks like after an analysis has been run in comparison to a polytomous item.

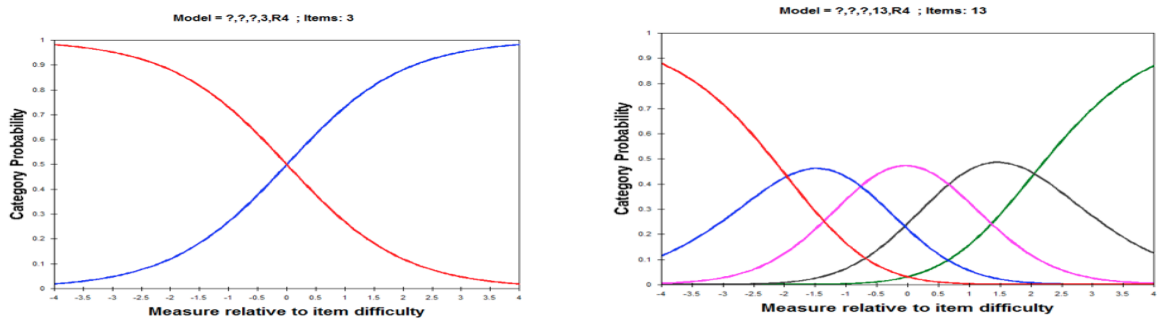

Figure 1. Dichotomous and polytomous items.

A more detailed explanation of the three models can be found in Appendix F.

In addition to polytomous items, there were also external variables (i.e., rater and form) which could systematically influence scores students obtained. For example, eight undergraduate students scored the tests. As there were a number of items for which scoring was ambiguous it

was recognized that the person scoring the test could affect the score assigned to the ambiguous items. Thus, *rater* was included as a facet in the model. In addition, two forms of the same test were created: Form A and Form B. The structure of each form was exactly the same, but the content was different. Each form was administered to all students. The different content included in the two forms could influence student responses and so *form* was included as an additional facet. Thus, a many-facets partial credit Rasch model was used. This model allowed us to run an analysis for student ability, item difficulty, rater and form.

FACETS, version 3.7.1.4 (Linacre, 2013) computer software was used to conduct the analysis of the Many-Facets Partial Credit Rasch model in order to determine reliability. Prior to running the analysis, the data were formatted in Excel to create a data input file and a specification file was created as a text document containing instructions for the FACETS software to analyze the data. Within the specifications, person ability was centered (the mean person ability parameter was set to 0). This enables the FACETS software to estimate parameters for all facets (Linacre, 2013).

Validity of the EECA R-2. Concurrent validity was examined by determining the relationship (correlation) between student scores on the EECA R-2 and student scores on a narrative comprehension measure, the TSC subtest of the NLM Preschool Assessment which was similar to the EECA R-2 in terms of format and emphasis. Correlations were calculated to examine the relationship between each of the EECA R-2 tasks and the TSC subtest of the NLM Preschool assessment. If the EECA R-2 is valid, the tasks on the EECA R-2 will be highly correlated with the TSC subtest of the NLM Preschool Assessment, retelling and comprehension question tasks.

Chapter 4:

Findings

The purpose of this study was to test the reliability of the EECA R-2 while adding a sequencing text structure and to test the validity of the EECA R-2. The following sections will first describe the results for the reliability of the EECA R-2 followed by the results for the validity of the EECA R-2.

Reliability of the EECA R-2

The reliability estimates produced by FACETS are analogous to the well-known Cronbach's Alpha used in classical test theory. Essentially, they are "the ratio of 'True' variance to 'Observed' variance for the elements of the facet" (Linacre, 2013, p. 314). Although the reliability obtained in a FACETS analysis is analogous to Cronbach's Alpha, it is not the same, as an interval scale is being used as opposed to an ordinal scale. The reliability of each facet included in the model can be seen in Table 3.

Table 3

Reliability of Each Facet

	Rater	Person	Item	Form
Model Sample Reliability	.00	.97	.99	.96

An estimate of .00 for rater reliability was obtained. This indicates that the raters "are not reliably different from one another" (Linacre, 2013, p.287). Of the 27 items being scored by raters, there were 13 non-ambiguous items and 14 ambiguous items. We would only expect variation to occur on the 14 ambiguous items. "FACETS models raters to be "independent experts" (Linacre, 2013, p. 187) on all items. Thus, the exceptionally desirable reliability

estimate of .00 for raters may be overestimated somewhat due to almost half of the items being non-ambiguous.

High reliability estimates were obtained for all facets (i.e., person, item and form). An estimate of .97 for person reliability indicates that the ratings obtained for the students tested are reliable. If the test was administered to a different but similar group of students and similar raters scored the test, similar results would be obtained. A reliability estimate of .99 for items and .96 for form indicates that the difficulty estimates obtained for items and form would likely be reproduced on subsequent administrations of the test. "Conventionally, only a Person Reliability is reported and called the "test reliability" (Linacre, 2013, p. 314).

Item statistics. Statistics obtained for each item are displayed in Appendix C. A measure statistic is given for each item indicating the relative difficulty of each item. Fit statistics are also given for each item indicating how well the data fit the model. It is recommended that the infit mean square statistic be used, which is a weighted statistic giving less weight to outliers. Fit statistics are expected to be close to 1. Linacre (2013) recommends that infit statistics should ideally be between .5 and 1.5 in test construction. Item 3 (graphics item 5) was the easiest (-1.46). Students were shown two pictures and were read a description, they were then asked to point to the picture that fit the description that was read. Item 13 (compare/contrast 1f) was the most difficult (1.83). After reading a compare/contrast passage, students were asked to retell what they had read. The infit mean square statistic for every item was between .79 and 1.38, suggesting the data fit the model in a way that is useful for test construction.

In addition to item difficulty and fit statistics, FACETS also estimates the probability of obtaining a particular score for each polytomous item. The results are reported as a threshold between two adjacent scores. The first threshold indicates the ability level at which the

probability of obtaining a score of 0 is equal to the probability of obtaining a score of 1. Similarly, the second threshold reported for an item indicates the point at which the ability level at which the probability of obtaining a score of 1 is equal to the probability of obtaining a score of 2. The threshold results for each item are displayed in Appendix D.

The probability of obtaining a particular score on each item can be displayed visually as category probability curves (see Appendix E). Each line in the graph represents the probability of obtaining that score. From both the graphs and the threshold statistics, the quality of the item and/or the quality of the scoring can be determined. As noted in Appendix E there were a number of items that worked well. For example, on item eight (shown here in Figure 2) a student with a low ability level of -3 has a high chance of getting a 0, a .05 chance of getting a 1 and an almost 0 chance of getting a 2 (the highest score for this item) whereas a student with a high ability level of 3.5 has a very high chance of getting a 2, a .05 chance of getting a 1 and an almost 0 chance of getting a 0. Items 6-13, 15, 18, and 23 were also determined as quality items (see Appendix E).

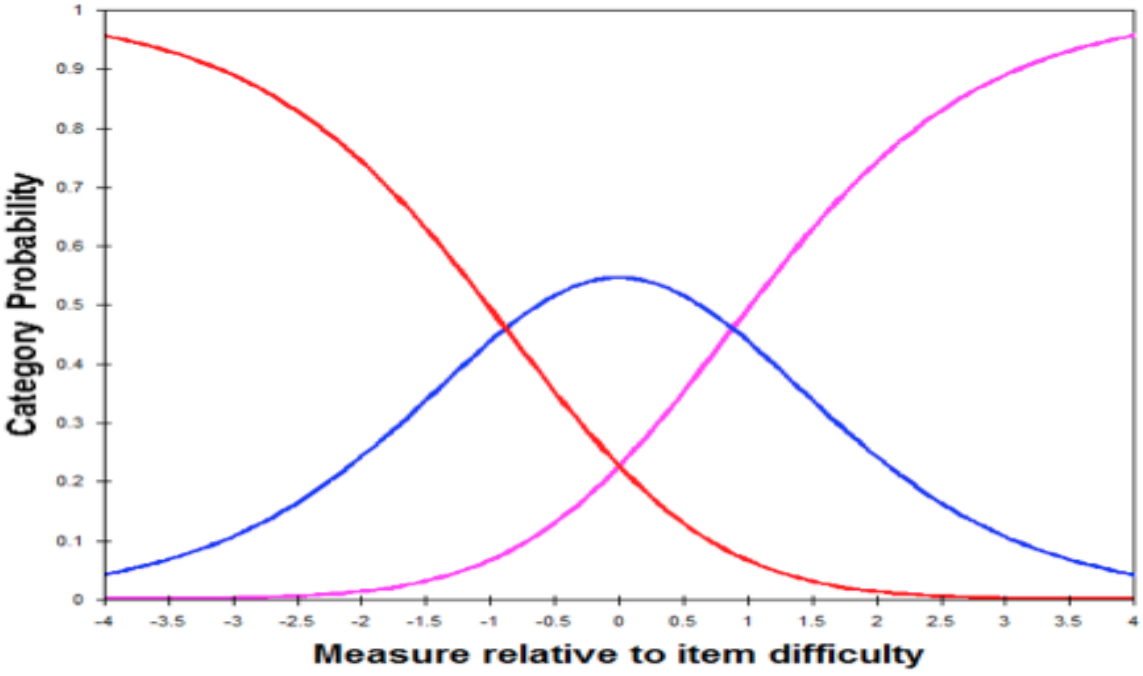

Figure 2. Probability category curve for item 8.

There were also a number of items that were problematic (see Table 4). For example, item 16 (shown here in Figure 3) did not work well. A student with an ability of 0 has the same chance of getting a 0 as they do of getting a 4 (the highest score for this item). All problematic items need to be carefully examined. Consideration must be given to the usefulness of each item as well as possible improvements to the task (e.g., prompt, pictures/graphics, task demands) and/or scoring procedures.

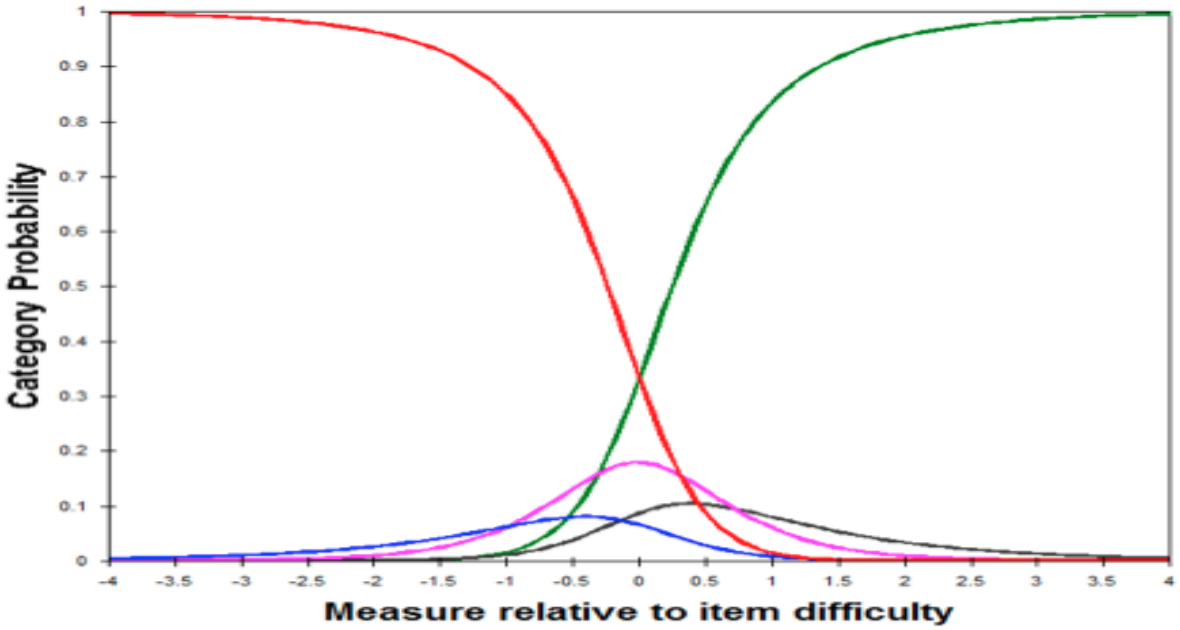

Figure 3. Probability category curve for item 16.

A brief explanation of each problematic item will be described below. See Chapter 5 for a more detailed description of each item and implications for future research. Items 1 and 2 were collapsed items. With item 1, students were shown a picture of both a fiction and a non-fiction text, and then asked "Which book would I choose if I wanted to read a pretend, make believe story about giraffes? Point to the book that I should choose." Students were then asked to explain why they chose that book. With item 2, this same process was repeated for a non-fiction text. Item 5 was the only graphics item that was problematic. Students were shown a picture from the text that was read to them and asked to tell what was happening in that picture.

Items 15, 20, and 25 were all the same task for each of the structures (compare/contrast, problem/solution, and sequencing.) After reading a text with each of these structures, students were given a blank graphic organizer and pictures from the text they just read. They were asked to put the pictures in order on the organizer based on the information they learned from the text. Items 16, 21, and 26 were follow up questions where students were asked to describe the events from the text that they read using the pictures that they organized for each of the three text structures.

Table 4

Problematic Items

Item #	Item Description
1	Purpose 1&2
2	Purpose 3&4
5	Graphics 7
15	Comp/Cont map
16	Comp/Cont 6f
20	Prob/Sol map
21	Prob/Sol 6f
25	Sequence map
26	Sequence 6f

Form statistics. From the measure estimates obtained for each form of the test, it can be determined that Form A (measure .05 logits) is a little more difficult than Form B (measure -.05 logits) with infit mean square statistics of 1 and 1.12 respectively, indicating a good fit of the data to the model.

Validity of the EECA R-2

Correlations were calculated to examine the relationship between each of the EECA R-2 tasks and the TSC subtest of the NLM preschool assessment. There was a positive correlation between the EECA R-2 (M=34.89 SD=13.22) and the TSC from the NLM preschool assessment (M=4.74 SD=3.67), r=.76, p= ≤.01, n=128. This suggests that the EECA R-2 is a valid measure.

Chapter 5:

Discussion

Although Common Core State Standards include more informational texts in early grades to emphasize reading to gain knowledge (Green, 2012; Roskos & Neuman, 2014), the lack of available expository assessments make it difficult for teachers to determine and monitor young children's expository skills (Hall et al., 2005; Harding, 2014). This study examined the reliability and the validity of the EECA R-2 an early expository assessment tool that may be helpful as teachers work to place greater emphasis on expository text skills in early childhood education classrooms.

As stated in Chapter 4, the EECA R-2 was deemed both valid and reliable. However, it is important to carefully analyze the problematic items and then consider possible revisions for the next iteration of the EECA. In the next section, each of the problematic items (compare/contrast retell, identifying the purpose of the text, graphics, and mapping) will be discussed in terms of practical significance, followed by a brief explanation of possible revisions to be considered in future research.

Compare/Contrast Retell

According the Englert and Heibert (1984) the compare/contrast text structure is a more complex structure for students to process (p. 94). On this version of the EECA, students had the most difficulty with the compare/contrast retell question (students listened to a compare/contrast text and were asked to tell the person sitting next to them what they learned), which confirms Englert and Hiebert's assertion that this structure is the most challenging. When teachers administer the EECA R-2, they should be aware of the relative difficulty of each of the

structures. This is particularly important as preschool teachers use the EECA and interpret student scores.

Because the retelling tasks worked well for the other two structures (problem/solution and sequencing), adjustments to the item itself may not be necessary. Suggested changes for future research of this item could include another iteration of the EECA to determine whether the compare/contrast retell item is again the most challenging item for students. If future studies indicate that this is the case, a stronger case could be made for the importance of emphasizing this text structure during classroom instruction to better support students or to suggest preschool teachers teach the compare/contrast structure for the end of the year, or even that it not be used on the pre-k version of the EECA and reserved for older students (e.g., kindergarten or first grade).

Items Related to Identifying the Purpose of the Text

Distinguishing between different genres of a text is an important, but challenging task (Reutzel & Fawson, 2008). In addition, young children may still easily confuse reality and fantasy (Sharon & Wooley, 2004). Thus, it is not surprising that the items related to identifying the purpose of the text (items 1 and 2) were deemed problematic. Students were asked to point to the picture of either a narrative or informational text based on a description of what they would learn about while reading and explain why they chose the cover that they did (i.e., Which book should I choose if I want to read a pretend, make-believe story about giraffes? Tell the person sitting next to you why you chose that book.)

It could be that this task is simply too challenging for students of this age group and should be excluded from future iterations of the EECA. However, it is also possible that the scoring could have been the problem. These items were collapsed items (two test questions were

combined because students had to answer the first question in order to respond to the second question). Students could have received partial credit for choosing the right book but not having a valid explanation as to why they chose it. By keeping this item on the next iteration of the EECA and making the scoring dichotomous, we would have a better understanding of the students who can identify each genre and those who cannot by only giving them credit if they got both items right. Careful attention to this item is needed on the next iteration of the EECA.

Graphics Item

Norman (2010) describes graphics as a key component to comprehension as it supports the words in a text and helps readers make meaning of what they are reading through a visual representation. Because making meaning through graphics supports overall comprehension, it is important that students learn how to identify relevant information from graphics and use this information to support the words they are reading to make meaning. Of the three graphics items on the EECA R-2, item 5 (graphics item 7) was the only one deemed problematic. In the graphics items that worked well, students were shown two pictures and read description, then they were asked to point to the picture that best matched the description. In graphics item 7, students were shown a picture from the text (a baby giraffe drinking milk from its mother) and asked to describe what was happening in the picture. As students were assessed on this item, many of them pointed out things that were in the picture (e.g., tall grass, a tree) that were irrelevant to the important information being expressed about giraffes (giraffes drink milk from their mothers). This could indicate the difficulty of this task and the importance of supporting students in their understanding that graphics support the words in a text just as Norman described.

Suggested changes to this item could include changing the picture that was used to make it less confusing to students by showing only giraffes in the picture from a closer angle and taking away distractions such as the tree next to them and the tall grass in front of them. Another idea would be to change the picture to one that more students might have background knowledge in to help them to better understand what was being depicted. We could then see if after changing the picture, students still have a difficult time with this task indicating its relevance to be more of a focus of preschool classroom instruction, or that it be a skill reserved for older students (e.g., kindergarten or first grade).

Mapping Items

Attending to text structure in expository texts is challenging because unlike narrative texts, there are many different ways that these texts can be organized (Read, Reutzel, & Fawson, 2008). However, properly identifying the structure of an expository text can support students in helping them locate and remember the relevant details expressed on a topic and retain the most important information described (Englert & Thomas, 1987). Thus, most researchers suggest text structure awareness is a critical strategy for effective comprehension of these types of texts (Englert & Thomas, 1987; Hall et al., 2005; Meyer, Brandt, & Bluth, 1980; Read, Reutzel, & Fawson, 2008). On the EECA R-2 the text structure (mapping) items (i.e., 15, 16, 20, 21, 25, 26) were problematic (students were asked to use a graphic to organize pictures according to structure of each text and then use the organizer to answer questions about the text). Because of the complexity of this task and the fact that the item was problematic with all three text structures, a closer examination of the directions, the task itself, and the scoring should be undertaken before determining the actual usefulness of the items.

Although there are likely many factors at play, assessment administrators did report that many students moved the pictures onto the organizer randomly, without attending to the graphic organizer. This suggests that there may be a problem with the instructions or perhaps that the task might be too challenging for students at this age. In terms of instructions, students were asked to choose the picture that shows the answer to the question presented on the graphic organizer and place it in the correct box. Making the instructions more specific (e.g., find the picture that shows you what lizards eat and place it in this [pointing] box) might help students better understand the task. In the next iteration of the EECA, researchers should consider redesigning this item and then again pilot test the task and instructions to help ensure these possible issues/confusion have been resolved.

Changes to the scoring may also help identify students who understand this task and those who do not. On the EECA R-2, students were given points for any items that they were able to properly organize, this means that if they just randomly placed the pictures in the graphic organizer they still may have gotten a point if it happened to be placed in the correct box. In the future it may be more helpful to consider only giving points to students who correctly organized all of the information in the organizer, to help avoid giving points for guessing. However, this could also be a lot to ask from preschoolers, with an already demanding task. Because there were so many potential factors that could have influenced the results that we obtained on these tasks, more research is needed to understand exactly why the above items were problematic.

Summary

The inclusion of more expository texts in early elementary grades can support an increase in comprehension and academic knowledge through deeper readings and critical thinking as students move from grade to grade (Green, 2012; Roskos & Neuman, 2013). Teachers must not

only expose students to these texts but also teach them the skills and strategies needed in order to navigate through and understand expository texts at higher levels (Duke & Kays, 1998; Hall, Sabey, & McClellan, 2005; Moss, 1997; Pappas, 1991; Witmer, Duke, Bilman, & Bets, 2014).

Teachers need a reliable and valid tool to help them identify the skills and strategies that students are using to comprehend these texts that will better support their instruction. The EECA R-2 may be helpful to teachers in understanding students' knowledge of text features, the purpose of the text, retelling abilities, and text structure. However, another iteration of the EECA R-2 is needed to gain a better understanding of the problematic items in order to support teachers in assessing student abilities and preparing classroom instruction that targets specific areas of focus to move learning to higher levels. Addressing the suggested changes will help us to know more concretely which expository skills should be focused on in depth. Teachers could then use the EECA to guide their instruction of expository texts during classroom instruction.

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APPENDIX A:

Version A Protocol

Hi! My name is Jane. Today we are going to read some books together so we can help some of my friends. I'm going to ask you some questions about the books. Some of the questions might be easy. Some of the questions might be tricky. Don't worry - just do the best you can.

Giraffe's Text

Here are pictures of two different books.

1. Which book should I choose if I want to read a pretend, make-believe story about giraffes? Point to the book that I should choose.

   Fiction Non-Fiction

   Here is the book you chose. Tell the person sitting next to you why you choose that book:

Here are pictures of two different books, again.

2. Which book should I choose if I want to read about where real giraffes live and what they eat? Point to the book that I should choose

   Fiction Non-Fiction

   Here is the book you chose. Tell the person sitting next to you why you choose that book:

I'm going to read some of this book. See if you can find the picture that goes with what I read.

3. Giraffes use their long necks to reach leaves at the top of trees. Point to the picture that goes with what I just read. Y N

4. Giraffes can sleep standing up. Point to the picture that goes with what I just read. Y N

5. Tell the person next to you what is happening in this picture:

On this page there are some words with lines pointing to different parts of the pictures. The words are labels for different parts of the giraffe.

6. Point to the label that says horn Y N
7. Point to the label that says ear Y N
8. Point to the label that says eye Y N
9. Point to the label that says tongue Y N
10. Point to the label that says neck Y N
11. Point to the label that says tail Y N
12. Point to the label that says legs Y N

Lizards and Frogs text

Now we are going to read about some different animals. My friend Anna is getting a new pet. She is getting a lizard or a frog. She needs to know how to care for them. Let's read about lizards and frogs. As we read, listen for how lizards and frogs are the same and how they are different. Then we can help Anna know how to care for lizards and frogs.
Lizards and frogs make cool pets. Lizards and frogs eat the same things. They eat crickets. You can buy crickets at the pet store. In some ways pet lizards and frogs are different. Lizards and frogs need different things in their tank. Lizards need a warm tank with sand. Frogs are different. Frogs need a tank with water and rocks. If you get a pet lizard or frog remember what it needs. What type of food does it eat? What does it need in its tank? That will help you take good care of your pet!

1. Here is my friend Anna. Tell her what you learned about lizards and frogs:

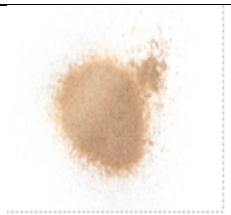
We are going to organize what we just read about lizards and frogs onto a chart like this. It will help Anna see how lizards and frogs are the same and how they are different. This says lizards and this says frogs. Now we are going to answer these questions about lizards and frogs. The person sitting next to you has a paper copy of the chart. They will ask a question about one of the animals. You choose the picture that shows the answer and put it in the correct box.

2. What did the book say lizards eat?

3. What did the book say frogs eat?

4. What did the book say lizards need in their tank?

5. What did the book say frogs need in their tank?



	 Lizards	 Frogs
What do they eat?		
What do they need in their tank?		

Here is the chart all filled out. Now, we can use this chart to talk about how lizards and frogs are the same and how they are different.

6. Use the chart to tell the person sitting next to you how lizards and frogs are the same.

7. Now use the chart to tell the person sitting next to you how lizards and frogs are different.

<u>Firefighters</u>

My friend Carlos just found out that the firefighters are coming to his preschool. He is so excited! He wants to learn about what firefighters do and how they help people. Will you help Carlos learn about firefighters? We can read about what firefighters do and how they help people in a book. Then when Carlos is here you can tell him what you found out.

Firefighters drive a red fire truck. They wear special clothes. They do a very important job. Firefighters put out fires. Have you ever seen something on fire? A car can catch on fire. A tree can catch on fire. Even a house can catch on fire. A house on fire is a big problem. The firefighters will fix the problem. The firefighters will spray water on the fire. This will stop the fire and fix the problem. Sometimes a cat gets stuck in a tall tree. This is a problem. Firefighters can fix the problem. They can use the ladder on the fire truck. A firefighter will climb up the ladder and get the cat out of the tree. This will solve the problem. Firefighters work hard to fix problems. They are brave. They help keep people and animals safe.

1. Here is my friend Carlos. Tell him what you learned about firefighters.

We are going to organize what we just read about firemen onto a chart like this. It will help us see the problems firefighters take care of and how they solve them. This says problem. This says solution. A solution is how somebody fixes a problem. The person sitting next to you has a paper copy of the chart. They will ask a question. You choose the picture that shows the answer and put it in the correct box.

2. What is a problem the firefighters had?

3. How did the firefighters fix the problem?

4. What is another problem the firefighters had?

5. How did the firefighters fix the problem?

Problem	Solution

Here is the chart all filled out. Now, we can use this chart to talk about problems firefighters take care of and how they fix them.

6. Tell the person sitting next to you the problems firefighters take care of and how they fix them.

Beans

My friend Sam loves to eat beans. He wants to know how we get beans. Let's read a book so we can teach my friend about how we get beans.

Have you ever planted a bean seed? Have you ever wondered what will happen? First the bean seed will start to grow roots. The roots will grow down into the dirt. The roots are like tiny straws. They suck up water from the dirt. The water helps the bean seed to grow. Next the bean seed grows a shoot. The shoot pokes up out of the dirt into the air. The shoot is also called the stem. Then leaves will start to grow on the stem. The bean plant needs sun and water to grow. Later beans will start to grow on the plant. Finally, the beans will be big. They will be ready to pick.

1. Here is my friend Sam, tell him what you learned about beans:

We are going to organize what we just read about how we get beans onto a chart like this. It will help us to talk about how we get beans. This says 'first'. This says 'next'. This says 'then'. This says 'finally'. The person sitting next to you has a paper copy of the chart. They will ask a question. You choose the picture that shows the answer and put it in the correct box.

2. What happens first for us to get beans?
3. What happens second for us to get beans?
4. What happens after that for us to get beans?
5. What happens last for us to get beans?

first	next	then	finally

Here is the chart all filled out. Now, we can use this chart to talk about how we get beans.

6. Use the chart to tell the person sitting next to you how we get beans

Great work! We're finished. I hope you enjoyed reading about giraffes, lizards and frogs, firefighters, and how we get beans.

APPENDIX B:

Version B Protocol

Hi! My name is Jane. Today we are going to read some books together so we can help some of my friends. I'm going to ask you some questions about the books. Some of the questions might be easy. Some of the questions might be tricky. Don't worry - just do the best you can.

Here are pictures of two different books.

Elephant text

1. Which book should I choose if I want to read a pretend, make-believe story about elephants? Point to the book that I should choose

   Fiction Non-Fiction

2. Here is the book you chose. Tell the person sitting next to you why you choose that book.

Here are pictures of two different books, again.

3. Which book should I choose if I want to read about where real elephants live and what they eat? Point to the book that I should choose

   Fiction Non-Fiction

4. Here is the book you chose. Tell the person sitting next to you why you chose that book

I'm going to read some of this book. See if you can find the picture that goes with what I read.

5. An elephant uses its trunk to squirt water on its body to keep cool. Point to the picture that goes with what I just read. Y N

6. Elephants can swim. They keep their trunk above water to breathe. Point to the picture that goes with what I just read. Y N

7. Tell the person next to you what is happening in this picture: (elephant uses its trunk to eat)

On this page there are some words with lines pointing to different parts of the picture. The words are labels for different parts of the elephant.

8. Point to the label that says trunk Y N
9. Point to the label that says ear Y N
10. Point to the label that says eye Y N
11. Point to the label that says tail Y N
12. Point to the label that says mouth Y N
13. Point to the label that says foot Y N
14. Point to the label that says skin Y N

Great work!

Pet Rabbits and Hamsters text

Now we are going to read about some different animals. My friend Anna is getting a new pet. She is getting a rabbit or a hamster. She needs to know how to care for them. Let's read about rabbits and hamsters. As we read, listen for how rabbits and hamsters are the same and how they are different. Then we can help Anna know how to care for rabbits and hamsters.

Rabbits and hamsters make fun pets. You can buy them at the pet store. In some ways rabbits and hamsters are the same. Rabbits and hamsters can sleep on the same type of bed. They sleep on wood flakes. In other ways rabbits and hamsters are different. Rabbits and hamsters eat different things. Rabbits eat hay. Hamsters are different. Hamsters eat seeds and nuts. If you get a pet rabbit or hamster remember what it needs. What type of bed does it like? What type of food does it eat? That will help you take good care of your pet!

1. Here is my friend Anna. Tell her what you learned about rabbits and hamsters:

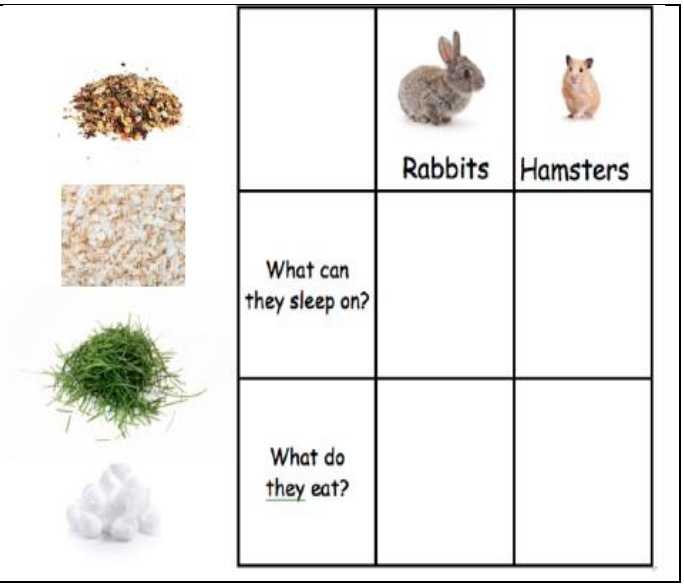
We are going to organize what we just read about rabbits and hamsters onto a chart like this. It will help Anna see how rabbits and hamsters are the same and how they are different. This says rabbits and this says hamsters. Now we are going to answer these questions about rabbits and hamsters. The person sitting next to you has a paper copy of the chart. They will ask a question about one of the animals. You choose the picture that shows the answer and put it in the correct box.

2. What did the book say rabbits sleep on?

3. What did the book say hamsters sleep on?

4. What did the book say rabbits can eat?

5. What did the book say hamsters can eat?



Here is the chart all filled out. Now, we can use this chart to talk about how rabbits and hamsters are the same and how they are different.

6. Use the chart to tell the person sitting next to you how rabbits and hamsters are the same:

7. Use the chart to tell the person sitting next to you how rabbits and hamsters are different:

Doctors Text

My friend Carlos is sick. He has to go to the doctors. He's a bit worried about it. He wants to learn about what doctors do and how they help people. Will you help Carlos learn about doctors? We can read about what doctors do and how they help people in a book. Then when Carlos is here you can tell him what you found out.

Doctors work in a hospital. They wear special clothes. They do a very important job. Doctors help people get better. Have you ever been sick? Did you have a cold? Did you have red spots on your body? Did you break a bone? Breaking a bone in your body is a big problem. It might be your leg, or your arm, or your finger. The doctor will fix the problem. The doctor will set the bone straight and put it in a cast. This will help the bone grow back together. Sometimes your ears might hurt. This is a problem. The doctor can fix the problem. The doctor will give you some medicine. This will solve the problem. Doctors work hard to fix problems. They are very helpful. They take care of people.

1. Here is my friend Carlos. Tell him what you learned about doctors.

We are going to organize what we just read about doctors onto a chart like this. It will help us see the problems doctors take care of and how they solve them. This says problem. This says solution. A solution is how somebody fixes a problem. The person sitting next to you has a paper copy of the chart. They will ask you a question. You choose the picture that shows the answer and put it in the correct box.

2. What was one problem the doctors fixed? 3. How did they fix that problem? 4. What was another problem the doctors fixed? 5. How did they fix that problem?	 Problem | Solution | | | |

Here is the chart all filled out. Now, we can use this chart to talk about problems doctors take care of and how they fix them.

6. Tell the person sitting next to you the problems doctors take care of and how they fix them.

Frogs Text

My friend Sam has been exploring and found some frogs. He wants to know about how frogs grow. Let's read a book so we can teach my friend about how frogs grow.

Have you ever seen a frog? Have you ever wondered where frogs come from? First an adult frog lays eggs. The eggs look like small black dots. The eggs are covered in something that feels like jelly. The frog will put the eggs in water. Next the eggs hatch. Out come tadpoles. Tadpoles are small and black. They look a bit like fish. Tadpoles swim with their tail. Then the tadpoles start to grow small legs. The tadpole becomes a baby frog. Finally, the baby frog will get big. It will become an adult frog. The frog's legs will be strong. The frog will be able to jump on rocks and swim in the water.

1. Here is my friend Sam. Tell him what you learned about how frogs grow.

We are going to organize what we just read about how frogs grow onto a chart like this. It will help us to talk about how frogs grow. This says 'first'. This says 'next'. This says 'then'. This says 'finally'. The person sitting next to you has a paper copy of the chart. They will ask a question. You choose the picture that shows the answer and put it in the correct box.

2. What happens first when frogs grow?

3. What happens second when frogs grow?

4. What happens after that when frogs grow?

5. What happens last when frogs grow?

first	next	then	finally

Here is the chart all filled out. Now, we can use this chart to talk about how frogs grow. Use the chart to tell the person sitting next to you how frogs grow.

6. Use the chart to tell the person sitting next to you how frogs grow.

Great work! We're finished. I hope you enjoyed reading about elephants, rabbits and hamsters, doctors, and how frogs grow.

APPENDIX C:

Item Infit Mean Square Statistics

Number	Test Item	Measure	Infit
1	Fiction 1&2	.89	1.27
2	Non-Fiction 3&4	.66	1.11
3	Graphics 5	-1.46	1
4	Graphics 6	-1.29	1.06
5	Graphics 7	.18	1.08
6	Labels 8	-.15	1.04
7	Labels 9	-.53	1.02
8	Labels 10	-.75	1.04
9	Labels 11	-.59	1.02
10	Labels 12	-.83	.95
11	Labels 13	-.83	.93
12	Labels 14	-.63	1
13	compare/ contrast retell 1f	1.83	.8
14	Prompted compare/contrast retell 1s	.56	.79
15	compare/ contrast mapping	-.76	1.09
16	compare/ contrast retell with map 6f	.06	.84
17	Prompted compare/ contrast retell with map 6s	-1.05	.82
18	Problem solution Retell 1f	1.38	.95
19	Problem solution Retell with prompting 1s	1.14	1.01
20	mapping	-.25	1.38
21	Problem/ solution retell with map 6f	-.22	1.21
22	Prompted problem/ solution retell with map 6s	-.27	.95
23	Sequencing Retell 1f	1.23	.83
24	Sequencing Retell with prompts 1s	.78	.86
25	mapping	.53	1.33
26	Sequencing retell with map 6f	.34	1.05
27	Prompted sequencing retell with map 6s	.03	.8

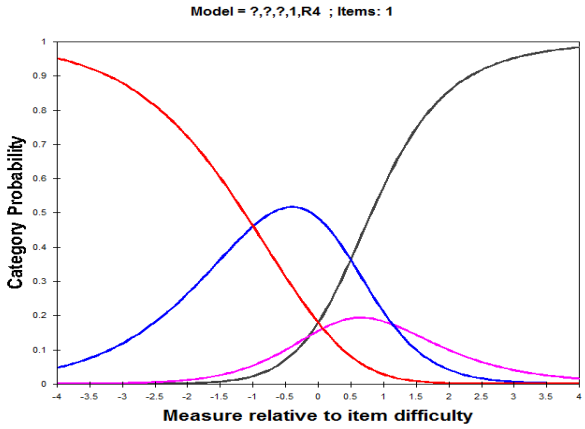
APPENDIX D:

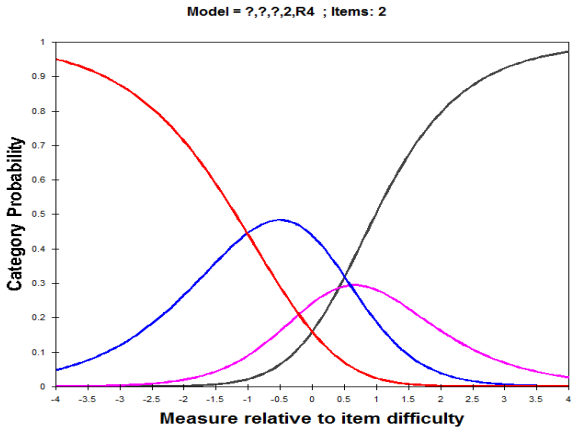
Item Thresholds

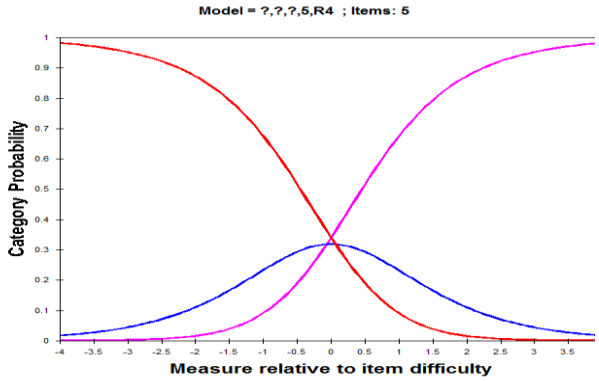
	Score			
Item	1	2	3	4
1	-.99	1.14	-.15	—
2	-1.01	.60	.41	—
5	.07	-.07	—	—
6	-.19	.19	—	—
7	-.73	.73	—	—
8	-.88	.88	—	—
9	-.75	.75	—	—
10	-1.11	1.11	—	—
11	-1.12	1.12	—	—
12	-.61	.61	—	—
13	-1.96	-.76	.66	2.06
15	-.57	.20	-.25	.63
16	1.62	-1.00	.72	-1.34
18	-1.87	-.67	.34	2.20
20	-.25	-.31	2.59	-2.03
21	.14	-.52	.45	-.07
23	-1.67	-.52	.85	1.33
25	.43	-.38	3.01	3.06
26	.14	-.21	.26	-.20

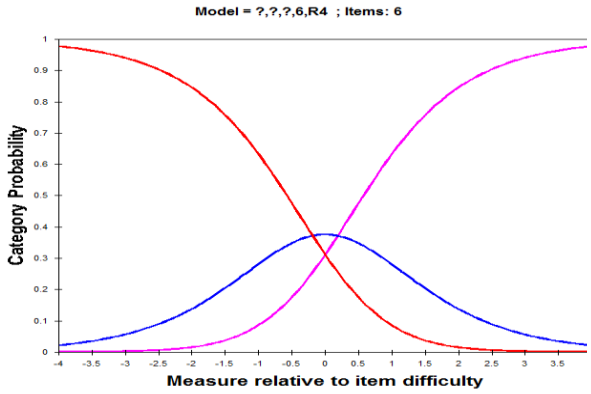
APPENDIX E:

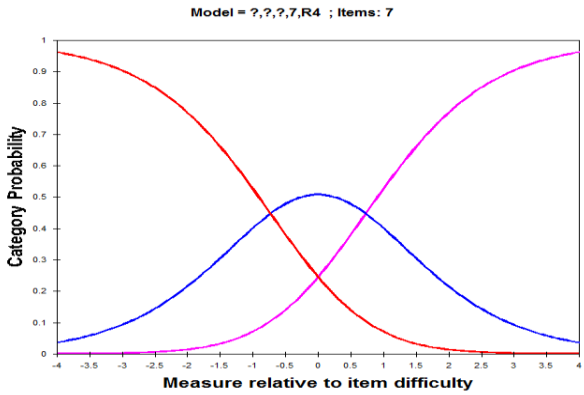
Probability Curves of Polytomous Items

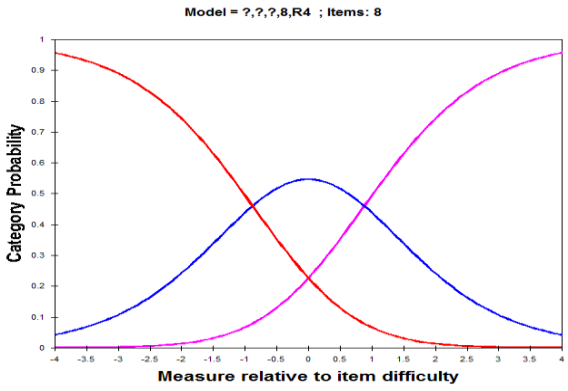


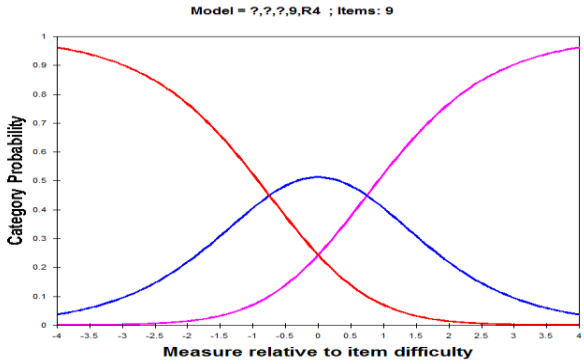








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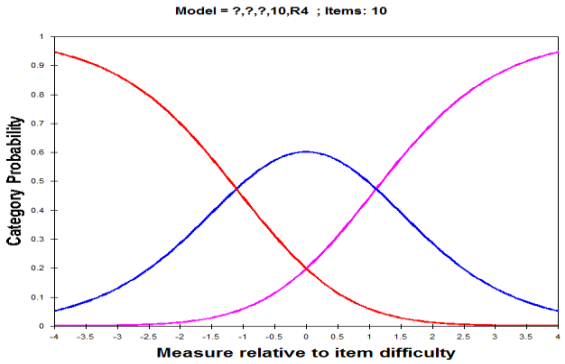
Category Probability
Measure relative to item difficulty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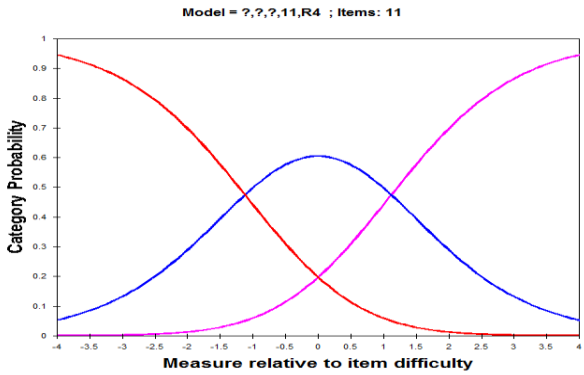
Category Probability
Measure relative to item difficulty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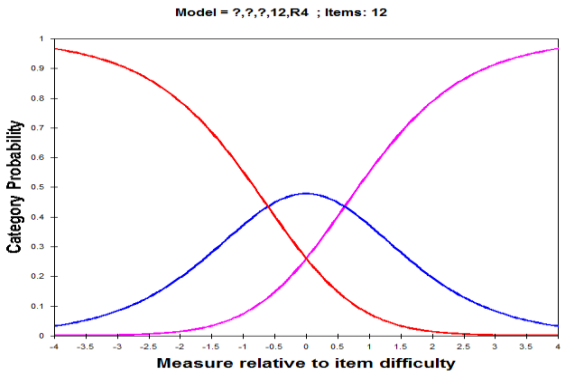
Category Probability
Measure relative to item difficulty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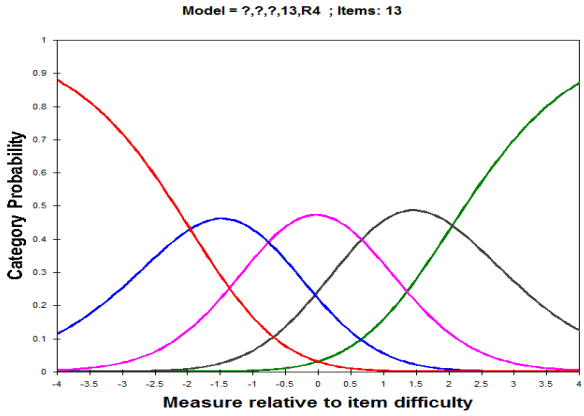
Category Probability
Measure relative to item difficulty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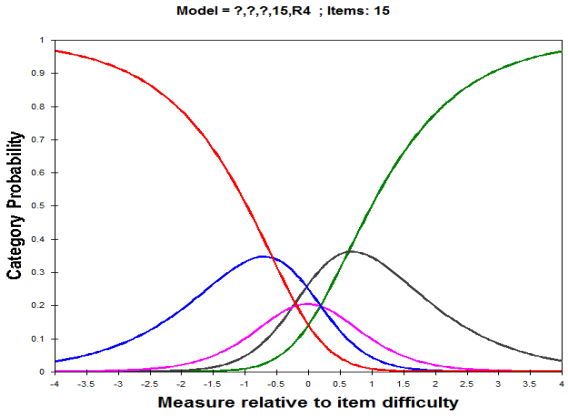
Category Probability
Measure relative to item difficulty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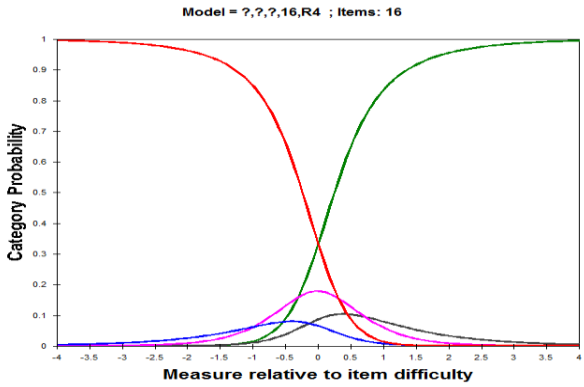
Category Probability
Measure relative to item difficulty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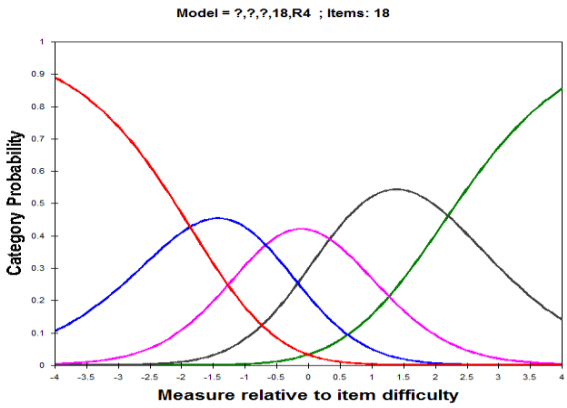
Category Probability
Measure relative to item difficulty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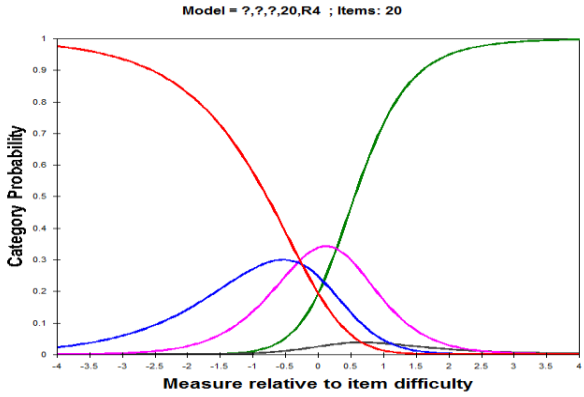
Category Probability
Measure relative to item difficulty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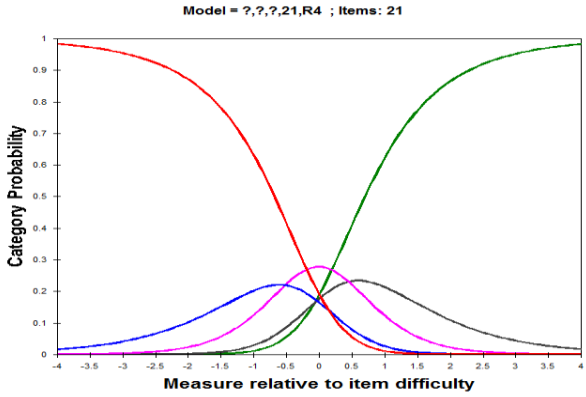
Category Probability
Measure relative to item difficulty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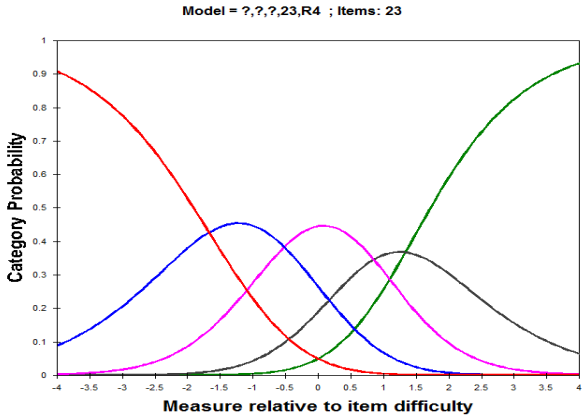
Category Probability
Measure relative to item difficulty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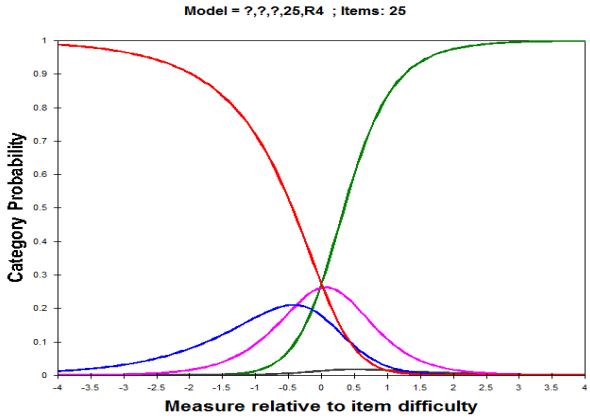
Category Probability
Measure relative to item difficulty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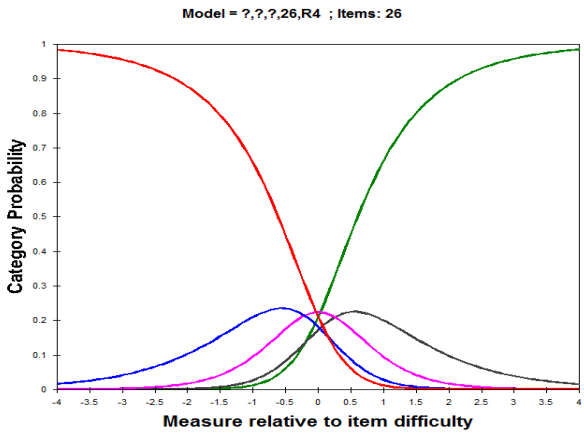
Measure relative to item difficulty



Key

Red-0

Blue-1

Pink-2

Black-3

Green-4

APPENDIX F:

The Many-Facets Partial Credit Rasch Model

The Basic Rasch Model: The Rasch model is a probabilistic model, in which the probability of a correct response to an item is a function of the difference between the person's ability (θn) and the item difficulty (β_i). The basic Rasch model can be seen in Equation 1.

$$p(x_{ni} = 1) = \frac{e^{(\theta n - \beta_i)}}{1 + e^{(\theta n - \beta_i)}} \quad (1)$$

This model states that the probability of person n answering item i correctly can be obtained by taking the base of the natural log (e) raised to the power of person n's ability minus item i's difficulty divided by one plus the base of the natural log (e) raised to the power of person n's ability minus item i's difficulty.

Person ability and item difficulty are parameters estimated within this model, using joint maximum likelihood estimation. Person ability and item difficulty parameters are expressed on the same scale and the unit in which these parameters are expressed is a logit (log-odds unit). Each person is assigned an ability estimate expressed as a logit and each item is assigned a difficulty estimate expressed as a logit or a "log odds unit". The above model can also be expressed in log odds terms as demonstrated in Equation 2:

$$\ln\left[\frac{p_{ni}}{1-p_{ni}}\right] = \theta_n - \beta_i \quad (2)$$

This equation states that taking the natural log (ln) of the ratio of the probability of answering an item correctly (p_{ni}) to the probability of answering the item incorrectly ($1-p_{ni}$) and multiplying that ratio by the natural log is the same as the difference between the person ability and the item difficulty in log-odds units (logits).

The Partial Credit Model: A partial credit model was used because the EECA-R2 contains items with a variety of structures, including both dichotomous and non-uniform polytomous items (i.e., items are constructed differently to one another). Additionally, some of the items did not meet the assumption of local independence, e.g., answering item 2 correctly was dependent upon answering item 1 correctly. The dependent items were collapsed and were treated as a testlet. Thus, the scores of item 1 and item 2 were combined to make one score. Items 3 and 4 were treated in the same way.

When using a partial credit model, a threshold parameter is added to the model, which is the logit at which a student has an equal chance of obtaining that score (k) and the adjacent score (k-1). Instead of using the difference between student ability (θ_n) and item difficulty (β_i) as in the basic Rasch model, the partial credit model uses the difference between student ability (θ_n), item difficulty (β_i), and the threshold between the two adjacent scores (τ_k). The model is as follows:

$$\ln\left[\frac{p_{nik}}{p_{nik-1}}\right] = \theta_n - \beta_i - \tau_k \quad (3)$$

The model in equation 3 states that the natural log of the probability of person n getting a score of k on item i divided by the probability of person n getting a score of k-1 on item i is the difference between the person's ability, the difficulty of the item, and the threshold between two adjacent score (k and k-1).

The Many-Facets Partial Credit Rasch Model: A many-facets model was used because it was deemed likely that variables, external to examinee ability and item difficulty, (i.e., rater and form) could systematically influence the scores students obtained. Eight undergraduate students

scored the tests. As there were a number of items for which scoring was ambiguous it was recognized that the person scoring the test could affect the score assigned to the ambiguous items. Thus, "rater" was included as a facet in the model.

Two forms of the same test were created: Form A and Form B. The structure of each form was exactly the same, but the content was different. Each form was administered to all students. The different content included in the two forms could influence student response. It was important to determine whether the two forms were equal in terms of difficulty and so "form" was included as an additional facet. To incorporate these additional facets the model we used can be seen in Equation 4.

$$\ln\left[\frac{p_{nijfrk}}{p_{nijfr(k-1)}}\right] = \theta_n - \beta_i - \eta_j - \lambda_f - t_k \quad (4)$$

θ_n = ability of student n
β_{ik} = difficulty of obtaining score k on item i
η_j = severity of rater j
λ_f = difficulty of form f
τ_k = threshold between score of k and score of k-1
p_{nijk} = probability of person n receiving a score of k on item i
p_{nijk-1} = probability of person n receiving a score of k-1 on item I

APPENDIX G:

Scoring Guide Version A

Giraffe Text

1. Which book should I choose if I want to read a pretend, make-believe story about giraffes? Point to the book that I should choose.
   Fiction 1 point
   Non-Fiction 0 points
   No response 0 points

2. Tell the person sitting next to you why you chose that book.
   Correct answer: The picture of the giraffe is pretend.

   The correct answer is stated 2 points
   e.g., Because it was pretend
   It's a pretend one – just like she said
   Because it isn't real

   Correct answer is implied 1 point
   e.g., Because it's a kids one
   It makes you believe … like your dreams
   Cause it has hearts on the side

   Correct answer is not stated or implied or no response 0 points
   e.g., Because I like that one
   Because it's a giraffe

1. Which book should I choose if I want to read about where real giraffes live and what they eat?
   Non-Fiction 1 point
   Fiction 0 points
   No response 0 points

2. Tell the person sitting next to you why you chose that book.
   Correct answer: The picture of the giraffe is real.

   Correct answer is stated 2 points
   e.g., Because it's a real giraffe
   Because it's a story about a real giraffe

   Correct answer is implied 1 point
   e.g., I wanted to see where they live
   So people can learn about animals
   It tells you where giraffe lives and what they eat.

Correct answer is not implied or stated or no response 0 points
e.g., Because animals they eat. They play with their swings and go to their grandmas.
Because I like the book

3. Giraffes use their long necks to reach leaves at the top of trees. Point to the picture that goes with what I just read.
Yes 1 point
No / No response 0 points

4. Giraffes can sleep standing up. Point to the picture that goes with what I just read.
Yes 1 point
No / No response 0 points

5. Tell the person next to you what is happening in this picture.
Correct answer: The baby giraffe is drinking milk from the mother

Correct answer is stated 2 points
e.g., The baby's getting milk
The baby is drinking the mom's milk
The baby giraffe is getting the mom or dad's milk

Something is stated that is in the picture but is not the correct answer 1 point
e.g., The giraffe baby
They were having babies
Eating leaves on mom
Their neck is tall.
The tree is too small for the giraffe to eat.

The correct answer is not implied or stated or no response 0 points
e.g., They're reaching leaves
Can't eat
Giraffe is sleeping

6. Point to the label that says …
word 2 points
line / item 1 point
incorrect / no response 0 points

Pet Lizards and Frogs text

1. Here is my friend Anna. Tell her what you learned about lizards and frogs:
1f. No information from the text or no response 0 points
1-2 pieces of information from the text 1 points
3-4 pieces of information from the text 2 points

5-9 pieces of information from the text 3 points
10+ pieces of information from the text 4 points

e.g.,
1 is black and white and is different. And they play like this (jumped) 0 points

You have to take care of them. 1 point

That they are different. Don't have the same tank. 1 point

I learned about frogs eat crickets and lizards eat crickets. And they are different. 2 points

To take care of lizard, need a home with sand. To take care of a frog, need to get them food and get them the home with grass & rocks. 2 points

They eat bugs. And they're different. One needs sand. One needs water. 2 points

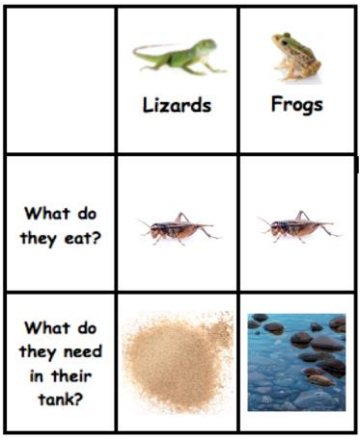
They need different things in tanks. Frogs need rocks and lizards need sand and it can climb mountains. 2 points

Frogs and lizards are pets and you can hold them. You keep them in a tank.
They eat crickets. Lizards need sand. Frogs need water. 3 points

2. Give 1 point if there is evidence that the student paid attention to the structure **(max1 point)**
   - by using a key word, e.g.:
     same, different, similar, both, alike, however, but

   OR
   - by talking about similarities or differences together, e.g.:
     I learned about frogs eat crickets and lizards eat crickets.
     One needs sand, one needs water
     They eat crickets.

   The following would NOT get a point:
   You have to take care of them
   They eat crickets
   They live in a tank



8. Give 1 point for every picture in the correct box:
   (**max 4 points**)

NOTE: the responses to the following question could be split over the main question and the two back-up questions.

4. Use the chart to tell the person sitting next to you how lizards and frogs are the same and how they are different.

4f. Give 1 point for every piece of information they talk about from the map (**max 4 points**) e.g.,

They're green.	0 points
They eat.	0 points
<u>They eat the same food.</u>	2 points
<u>They eat crickets</u>. <u>Have water and rocks</u>.	3 points
<u>One lives in water</u> and <u>the other needs sand</u>. <u>Both of them eat crickets</u>.	4 points
<u>They eat the same things</u> and <u>live in different things.</u>	4 points
<u>They have different tanks</u>. <u>They eat the same things</u>. <u>One of them needs sand</u> and <u>the other needs rocks.</u>	4 points

NOTE: If a child points to each picture correctly in response to the questions, rather than describe what's happening, please highlight the box on the scoring sheet in blue.

4s. Give 1 point if there is evidence that the student paid attention to the structure (**max 1 point**)

- by using a key word, e.g.:
  same, different, similar, both, alike, however, but

OR

- by talking about similarities or differences together, e.g.:
  I learned about frogs eat crickets and lizards eat crickets.
  One needs sand. One needs water.
  They eat crickets. Have water and rocks.

The following would NOT get a point:
Lizards like crickets.

<u>Firefighters</u>

1. Here is my friend Carlos. Tell him what you learned about firefighters.

1f. No information from the text or no response	0 points
1-2 pieces of information from the text	1 points
3-4 pieces of information from the text	2 points
5-9 pieces of information from the text	3 points
10+ pieces of information from the text	4 points

e.g.,

They do a good job	0 points
They help everything	0 points
Spray water and getting cats out of the tree	1 point
The cat got stuck on the tree and the firefighters got the kitty cat down the tree	1 point
They save cars, houses, cats … They have a cool job.	2 points
I learned about firefighters drive a red truck. They get the cat out of the tree. They save people.	2 points
They help animals & people be safe and they take out fire and rescue your cat or dog.	2 points
By getting the house fired and by the cat got stuck in the tree, and by the car caught fire.	2 points
Firefighters can drive in their red car. They are brave. They help people and animals. They fix problems.	3 points
So, firefighters. If you have a house on fire they can fix it. If you have a tree on fire they can fix it. If you have a car on fire they can fix it. If you have a cat stuck in a tree they can get it down with a ladder.	3 points

1s. Give 1 point if there is evidence that the student paid attention to the structure **(max1 point)**

- by using a key word, e.g.:
  problem, solution, solve, fix

OR

- by talking about problems/solutions together, e.g.:
  They can fire everything and they can stop the fire
  The cat got stuck on the tree and the firefighters got the kitty cat down the tree.

The following would NOT get a point:

They put out fire – they use hose
Use ladder to get kittens from tree
They spray the water and save pets
They help animals and people be safe and they take out fire and rescue your cat or dog.

7. Give 1 point for every picture in the correct box. (max 4 points)
   NOTE: The rows could be switched around (fire and water picture on the bottom and cat and ladder picture on the top)

NOTE: the responses to the following question could be split over the main question and the two back-up questions.

8. Tell the person sitting next to you the problems firefighters take care of and how they fix them.

3f. Give 1 point for every piece of information they talk about from the map (**max 4 points**)
e.g.,

The house one. 0 points

The house on fire. 1 point

When the cat got stuck in the tree and when house caught fire, went and fixed problem
2 points

Firefighters they help. Put the water on it and help the cat to get out of the tree.
And then the house was fired and they put water on it and it don't get fired. 3 points

Fire house. Kitty cat in the tree. Putting water. Saving the cat. 3 points

FF can help with burning house and putting water. Helping the cat with a ladder. 4 points

They can spray water out to get the fire out of the house. They could climb up a ladder and get a cat out. 4 points

NOTE: If a child points to each picture correctly in response to the questions, rather than describe what's happening, please highlight the box on the scoring sheet in blue.

3s. Give 1 point if there is evidence that the student paid attention to the structure (**max 1 point**)

- by using a key word, e.g.:
  problem, solution, solve, fix

OR

- by talking about the problem and solution together, e.g.:
  Firefighters can help with burning house and putting water.
  Cat stuck in tree –> use ladder to get cat
  House gets on fire and do hose
  They get water for when fire is on house they get it
  Cats get stuck in a tree and firefighters get a ladder and help them.
  To take out fire, need water.
  To take cat out of tree, you need a ladder.

The following would NOT get a point:
They take care of cats.
They spray water in a hose
Helping the cat with a ladder
Fire House. Kitty cat in the tree. Putting water. Saving the cat

Beans Text

1. Here is my friend Sam. Tell him what you learned about beans.

1f. No information from the text or no response 0 points
1-2 pieces of information from the text 1 point
3-4 pieces of information from the text 2 points
5+ pieces of information from the text 3 points

e.g.,
They grow. 1 point

Beans – they need water to grow and so you plant them in the dirt 1 point

Beans grow from a stalking. Beans get bigger. Stalkings suck up water. 1 point

Me pull out a plant and leaves will grow on it. That what will grow first. Then it will grow bigger and bigger. 1 point

To get beans, they grow. Need sun and water to make them grow. 2 points

Put it in the dirt and they can grow. Then it's ready to pick up. 2 points

by planting the beans and the sun and then by picked up the beans when the beans grow 2 points

1s. Give 1 point if there is evidence that the student paid attention to the structure **(max1 point)**

- by using a key word, e.g.:
  first, then, next, after, later, last, finally

OR

- by talking about what happens in sequence, e.g.:
  By planting the beans and the sun and by picked up the beans when the beans grow.
  You plant a seed. Roots grow. You water the seed. It will grow leaves.

The following would NOT get a point:
Beans they need water to grow and so you plant them in the dirt.
To get beans, they grow. Need sun and water to make them grow.

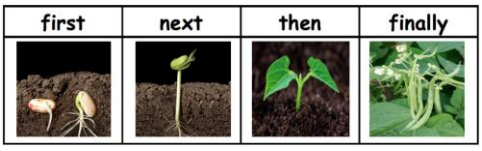
7. Give 1 point for every picture in the correct box.
   (**max 4 points**)

NOTE: the responses to the following question could be split over the main question and the two back-up questions.

8. Use the chart to tell the person sitting next to you how beans go from a seed to becoming a bean.

3f. Give 1 point for every piece of information they talk about from the map (**max 4 points**) e.g.,

First they get planted, need water. Then they grow. 0 points



You put a seed in, then you watch it. Then it start to grow. Then it grows more.
Then you get the beans. 1 point

You plant it and give water and sun. The bean grows and turns into a plant. 2 points

Finally beans grow off.

Cause they put a lot of water. They were little (points at beans). Looks like a plant (points at sprout). It was growing a lot (w/ stem). Plant (points to bean plant. Ready to pick up. 2 points

They have roots. They go up. Then leaves. Then flowers and beans. 4 points

NOTE: If a child points to each picture correctly in response to the questions, rather than describe what's happening, please highlight the box on the scoring sheet in blue.

3s. Give 1 point if there is evidence that the student paid attention to the structure (**max 1 point**)

- by using a key word, e.g.:
  first, then, next, after, later, last, finally

OR

- by talking about bean growth in the correct sequence, e.g.:
  You put the seed and it grows out and gets bigger and drinks water and then you have some beans.
  You need to put beans in and then they grow.
  They have roots. They go up. Then leaves. Then flowers and beans. They were little. Looks like a plant. It was growing a lot. Plant. Ready to pick up.

The following would NOT get a point:

By planting the flowers and by the sun and by growing and by picking them and by growing and by drinking the water.

APPENDIX H:

Scoring Guide Version B

Elephant Text

1. Which book should I choose if I want to read a pretend, make-believe story about elephants? Point to the book that I should choose.
   Fiction 1 point
   Non-Fiction 0 points
   No response 0 points

2. Tell the person sitting next to you why you chose that book.
   Correct answer: The picture of the elephant is pretend.

   The correct answer is stated 2 points
   e.g., Because it was pretend
   Because I love to watch movies from the pretend ones
   Because it isn't real

   Correct answer is implied 1 point
   e.g., Because it is holding a flower
   Because the elephant is blue

   Correct answer is not stated or implied or no response 0 points
   e.g., Because I like elephants
   Because I read it
   Because elephants are cool

1. Which book should I choose if I want to read about where real elephants live and what they eat?
   Non-Fiction 1 point
   Fiction 0 points
   No response 0 points

2. Tell the person sitting next to you why you chose that book.
   Correct answer: The picture of the elephant is real.

   Correct answer is stated 2 points
   e.g., Because they're real elephants
   Because real elephants eat grass

   Correct answer is implied 1 point
   e.g., Because I saw elephants at a zoo
   Because it tells us where they live and what they eat
   Because she said what elephants eat

Correct answer is not implied or stated or no response 0 points
e.g., Because I like elephants
Because I read it
Because elephants are cool

3. An elephant uses its trunk to squirt water on its body to keep cool. Point to the picture that goes with what I just read.
Yes 1 point
No / No response 0 points

4. Elephants can swim. They keep their trunk above water to breathe. Point to the picture that goes with what I just read.
Yes 1 point
No / No response 0 points

5. Tell the person next to you what is happening in this picture.
Correct answer: The elephant uses its trunk to eat.

Correct answer is stated 2 points
e.g., He's eating.

Something is stated that is in the picture but is not the correct answer 1 point
e.g., The elephant is standing in the flowers.
He has big ears.

The correct answer is not implied or stated or no response 0 points
e.g., He's lost.
He's walking.
The elephant's cute.

6. Point to the label that says …
word 2 points
line / item 1 point
incorrect / no response 0 points

Pet Rabbits and Hamsters text

1. Here is my friend Anna. Tell her what you learned about rabbits and hamsters:
1f. No information from the text or no response 0 points
1-2 pieces of information from the text 1 points
3-4 pieces of information from the text 2 points
5-9 pieces of information from the text 3 points
10+ pieces of information from the text 4 points

e.g.,
They eat. 0 points

They eat food and grass and they sleep in the house. 1 point

They live in … They sleep in … Rabbits eat grass. Rabbits are different and hamsters are different too. 1 point

You can take care of them. Rabbits eat grass and hamsters eat seeds and they are fun pets. 2 points

They eat grass and nuts and peanuts … hamsters eat nuts. They live in same beds 2 points

Rabbits eat grass and hay and hamsters eat nuts and seeds and they both like the kind of bed. In some ways they are different. 3 points

1s. Give 1 point if there is evidence that the student paid attention to the structure **(max1 point)**

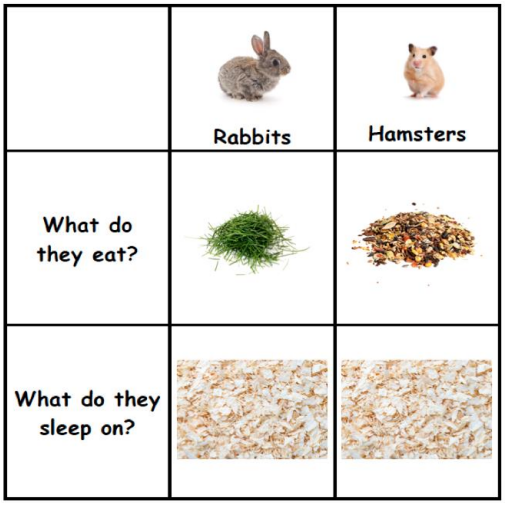
- by using a key word, e.g.:
  same, different, similar, both, alike, however, but

OR

- by talking about similarities or differences together, e.g.:
  Rabbits eat grass and hamsters eat something else.
  Rabbits eat hay and grass. Hamsters eat seeds and nuts.
  They sleep on woodflakes.

The following would NOT get a point:
They eat food and grass.

2. Give 1 point for every picture in the correct box:
(**max 4 points**)



NOTE: the responses to the following question could be split over the main question and the two back-up questions.

3. Use the chart to tell the person sitting next to you how rabbits and hamsters are the same and how they are different.

3f. Give 1 point for every piece of information they talk about from the map (**max 4 points**) e.g.,

That one's black and that one is different. There's a big bunny mom … A lot of grass then they grow. 0 points

They eat. 0 points

Eat different food. 2 points

Rabbits eat some grass and then hamsters eat some those (points to seeds) 2 points

They eat grass and sleep on the same stuff. 3 points

They eat grass and nuts and peanuts. Hamsters eat nuts. They live in same beds. 4 points

They sleep in the same things and eat different things. 4 points

Hamsters are different because they eat seeds. Bunnies eat grass. That's why they are different. They both sleep in … I can't remember the word. 4 points

NOTE: If a child points to each picture correctly in response to the questions, rather than describe what's happening, please highlight the box on the scoring sheet in blue.

3s. Give 1 point if there is evidence that the student paid attention to the structure (**max 1 point**)

- by using a key word, e.g.:
  same, different, similar, both, alike, however, but

OR

- by talking about similarities or differences together, e.g.:
  Rabbits eat grass. Hamsters eat seeds.
  One needs sand, one needs water
  They sleep on woodflakes.

The following would NOT get a point:
They eat.
Hamsters eat nuts.

Doctors Text

1. Here is my friend Carlos. Tell him what you learned about doctors.

1f. No information from the text or no response 0 points

1-2 pieces of information from the text	1 points
3-4 pieces of information from the text	2 points
5-9 pieces of information from the text	3 points
10+ pieces of information from the text	4 points

e.g.,

They do a good job	0 points
They help everything	0 points
There's hard and <u>they take care of ears.</u>	1 point
<u>They wear very special costumes.</u>	1 point
<u>They help you feel better.</u>	1 point
<u>They work so hard</u> and <u>when somebody gets hurt</u> <u>they fix the problem.</u> <u>They go to the hospital</u>.	2 points
<u>They go to the hospital</u> and <u>fix people's bones</u> and <u>help people's ears</u>. They <u>work very hard.</u>	2 points
<u>They eat medicine</u>. <u>Sometimes feet/hands/head broken</u>. <u>They get casts</u>.	2 points
Doctors are very nice and if you have your leg or <u>your ear hurts</u> or <u>your arm broke</u> and if you have broken thing, <u>they'll do something</u>. If your ear hurts or if sick, <u>they will be super helpful</u> and careful.	2 points

1s. Give 1 point if there is evidence that the student paid attention to the structure **(max1 point)**

- by using a key word, e.g.:
  problem, solution, solve, fix

OR

- by talking about problems/solutions together,e.g.:
  If you have a hurting ear they will give you medicine.
  They give you a cast when you break your elbow.
  If you have a broken thing, they'll do something.

The following would NOT get a point:
They give you medicine.
They make you feel better.
They help when your ear hurts.

2. Give 1 point for every picture in the correct box.

(**max 4 points**)
NOTE: The rows could be switched around (ear and medicine on top and arm and cast on bottom)

NOTE: the responses to the following question could be split over the main question and the back-up questions.

3. Tell the person sitting next to you the problems doctors take care of and how they fix them.

3f. Give 1 point for every piece of information they talk about from the map (**max 4 points**)
e.g.,

They're fixing with this and they're fixing with this. 0 points

She hurt her ears. 1 point

They give them some medicine and then when they're sick and when they break their bones. 2 points

When someone breaks a bone, they can put one of those things. 2 points

They breaked a bone and hurting ears and medicine. 3 points

So, how they fix if you have a broken bone, give them medicine. If you have an itchy ear, give them medicine. 3 points

They fix them when somebody hurts their ear. Give them medicine. If you break your bone we can put something in it. 4 points

Broken bone. Cast. Hurting ear. Medicine. 4 points

When you hurt your ear and then they fix the problem. And then they break their bones and they gave them something like that (cast) and give them medicine. 4 points

NOTE: If a child points to each picture correctly in response to the questions, rather than describe what's happening, please highlight the box on the scoring sheet in blue.

3s. Give 1 point if there is evidence that the student paid attention to the structure (**max 1 point**)

- by using a key word, e.g.:
  problem, solution, solve, fix

OR

- by talking about problem/solution together, e.g.:
  When someone breaks a bone, they can put one of those things.
  They put a cast when they broke a bone.
  Broken bone. Cast. Hurting Ear. Medicine.

The following would NOT get a point:
They give medicine.
They help you feel better.

How Frogs Grow Text

1. Here is my friend Sam. Tell him what you learned about how frogs grow.

1f. No information from the text or no response	0 points
1-2 pieces of information from the text	1 points
3-4 pieces of information from the text	2 points
5-9 pieces of information from the text	3 points
10+ pieces of information from the text	4 points

e.g.,

They hatch.	1 point
Because they grow and then they grow all day into … and then they grow.	1 point
They grow. Tadpoles. They drink water. They tail. They friends w/ fishes.	2 points
They lay eggs in the water. They turn into tadpoles and they get legs and they become a frog.	2 points
They jump in the water and they put their eggs in the water and they're baby frogs. Then they get stronger.	2 points
They hatch. Frogs are black. Look like fish. They grow old. Their legs are strong and they can jump on rocks.	3 points
Lays eggs and then turn into something else. Have small legs and dots and they swim.	3 points

1s. Give 1 point if there is evidence that the student paid attention to the structure **(max1 point)**

- by using a key word, e.g.:
  first, then, next, after, later, last, finally

OR

- by talking about what happens in sequence, e.g.:
  They lay eggs in the water. They turn into tadpoles and they get legs. They hatch. Frogs are black. Look like fish. They grow old.

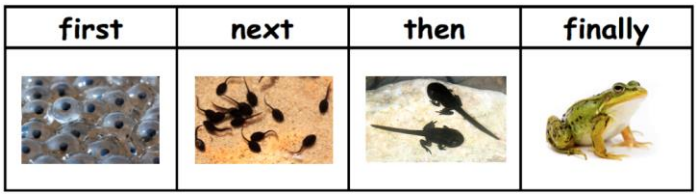
The following would NOT get a point:
They grow big.
They grow. Tadpoles. They drink water. They tail. They friends w/ fishes.

2. Give 1 point for every picture in the correct box.
   (**max 4 points**)

NOTE: the responses to the following question could be split over the main question and the back-up questions.

3. Use the chart to tell the person sitting next to you how frogs go from being an egg to a frog.

6f. Give 1 point for every piece of information they talk about from the map (**max 4 points**)
e.g.,
Frogs have strong legs and they jump high.
0 points



Egg first. They go in eggs. I already did those things. 1 point

Put eggs in the water. They grow big like this. Those are – they're want to go in the water and play over there. 1 point

Be they're do eggs in the water and then they are baby frogs and then they get stronger and they jump in the water. 2 points

Goes like eggs but black, they grow and look like fish. They grow with legs, and then grow skin and have strong legs and that's it. 3 points

They first started hatching and got in the water. First started hatching. Put them in water. They get legs. Then they turn into adult. 3 points

The frogs lay eggs and they turn to tadpoles and they start growing legs and they become a frog. 4 points

NOTE: If a child points to each picture correctly in response to the questions, rather than describe what's happening, please highlight the box on the scoring sheet in blue.

3s. Give 1 point if there is evidence that the student paid attention to the structure (**max 1 point**)

- by using a key word, e.g.:
  first, then, next, after, later, last, finally

OR

- by talking about frog growth in the correct sequence, e.g.:
  The frogs lay eggs and they turn to tadpoles and they start growing legs and they become a frog.
  Eggs in water turn into tadpoles and grow legs.
  Put eggs in the water. They grow big like this.

The following would NOT get a point:
They grow strong legs and like to jump.