On Researching Dyslexic Readers Through Graphic Novel Conventions:

Pitfalls and Possibilities

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Abstract: Research in Disability Studies and Graphic Design suggests promising aspects of the relationship between page design and the ability of readers to comprehend text. Page design for graphic novels includes how actual text is framed by balloons, which convey meaning through their various shapes. This paper examines problems in researching the extent to which certain sequential art design conventions associated with graphic novels promise to aid college students in their reading. The study explores issues associated with exploring the meaning making of dyslexic and non-dyslexic college students who examined graphic novel narratives in text-only, text and image, and image-only formats and who answered questions about these artifacts through surveys. Study limitations involved not only the fact that entire graphic novels could not be included, but also the fact that difficulties in having access to information about students with disabilities were more severe than anticipated and unanticipated problems linked to excerpt selection arose. The paper concludes with an accounting of student reactions to the various formats and of the significance of the research.

Key words: Disability studies, research design, page design, graphic novels, dyslexia

1. Introduction

While it is true that the role of visual factors in dyslexia has been a long-standing source of controversy in vision research [4], research in the area of design and learning disabilities suggests surprising and promising aspects of the relationship between the design of the page and the ability of children to comprehend text. For example, it has been reported that the "backward" orientation of manga (Japanese graphic novels) can help autistic children with reading [8].

My study had as its initial goal examining whether certain generic design conventions associated with graphic novels promise to aid college students in their reading. Such conventions involve, for example, how actual text in these novels is framed. The very shape of text balloons in comics, for example, conveys meaning [6]. In addition, gutters [7], cell sequence patterns [5], stylized image patterns [9] and established iconography [2] all become visual frameworks for interpretation.

The survey instrument at the heart of my study examined the meaning making of dyslexic and non-dyslexic participants viewing excerpts from graphic novel narratives posted online that appeared in text-dominant, text and image, and image-dominant formats. Participants then completed a survey that examined the extent to which they developed an understanding both of the visual cues provided by comic-book design conventions and of the content of the graphic novel narratives themselves. Participants were drawn from students who are

serviced by Disability Resources as well as from volunteers who are currently enrolled at Grand View University.

As it turned out, the difficulties that arose during the course of the study became an important finding of the research and are reported below along with the findings of the research regarding the students' reading of text only, image and text, and image only formats.

2. Methodology

The selection of generic design conventions for use in my study takes advantage of methodologies developed from sources that provide a type of "grammar" of comics and graphic novels [3, 9]. The articulation of the design patterns underlying visual cues in the narrative excerpts draws inspiration from research in pattern language [1].

2.1 The Survey

The online survey uses excerpts taken from a graphic-novel version of *Walden* [11]*,* as well as from Hayao Miyazaki's classic graphic novel *Nausicaä of the Valley of the Wind* [10]. The survey also gathers demographic information, including age, gender, nationality, education level, and self-identified learning disabilities of the participants. One limitations of this study is that entire graphic novels cannot be presented. Another limitation occurred when the survey itself was placed online: the words in the text and image format version of *Pride and Prejudice* were too small to decipher, so the selection was not used.

The survey asked two questions of each formatted excerpt: "What is the main idea of this excerpt?" and "What is the tone of this excerpt?" At the end of the excerpts for text only, image and text, and image only formats, the question, "For the excerpt, which version was most effective for you as a reader? Briefly explain why."

2.2 Permissions

Another limitation involved the self-identification of learning disabilities. In research projects involving students with disabilities at two previous universities, permission to examine dyslexic readers and autistic children, respectively, was granted to the researcher. For example, one project directed by this researcher examined the growth achieved in various reading measures (fluency, prosody, punctuation comprehension) when dyslexic students used multisensory at-home reinforcement. As it turns out, crucial to permissions necessary to this 2011 study were various affiliation agreements between the university and the site involved. Because the site of this current study was the university itself, it was not anticipated that there would be difficulty in gaining access to students with disabilities. However, during the permissions process, all references to disabilities in the survey were struck, and the researcher was not even permitted to ask students to self-identify. This meant that the researcher could not reliably credit the results to those having disabilities versus those not having them.

The results of this study are important, however, to the future selection of excerpts in image only, image and text, and text only formats. The results also provide information on the meaning making of the college students when faced with different formats. And they serve as preliminary to research on readers with learning disabilities and how graphic novel conventions affect their meaning making.

2.3 Participants

There were eighteen participants who completed the survey. Without prompting, one of the participants identified herself as learning disabled. There were 7 males and 11 females. Sixteen were between the ages of 18 and 21, and two were between the ages of 22-24. There were five freshmen, eight sophomores, and five juniors. There were no international students. Nine students reported that they had traveled both nationally and internationally; five reported some travel in the United States, most being regional; four left the response blank. All but one are Caucasian, and one is southeast Asian. The small number of participants is a limitation of the study.

3. Analysis

The following analysis captures survey results for the participants' reading of *Walden* and of *Nausicaä.*

3.1 Walden

An analysis of text only, image and text, and image only formats shows these results. The text only excerpt was taken from the original Walden, because there were no text only excerpts in the graphic novel. It reads:

> I went to the woods because I wished to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived. I did not wish to live what was not life, living is so dear; nor did I wish to practice resignation, unless it was quite necessary. I wanted to live deep and suck out all the marrow of life; to live so sturdily and Spartan-like as to put to rout all that was not life, to cut a broad swath and shave close, to dive life into a corner, and reduce it to its lowest terms, and if it proved to me mean, why then to get the whole and genuine meanness of it, and publish its meanness to the world; of if it were sublime, to know it by experience, and be able to give a true account of it in my next excursion.   *Walden: Where I lived and What I lived for.*

For the text only excerpt of *Walden*, 100% mentioned "the meaning of life" as being part of the main idea. The most complete answer (by the most traveled student) stated: "The writer goes into isolation away from the material world to seek out [the] meaning of life by living it." Two participants (one male and one female) thought the excerpt contained a dichotomy between nature and society.

In terms of tone, participants thought the excerpt sounded: determined, very somber, logical and factual, serious, masculine and philosophical, humble, poetic, passionate and searching, dedicated, calm and inspiring, contemplative, depressing, sophisticated (with a question mark), and pensive and defiant, and sad. Three participants thought the excerpt was sad.

The second image, the image and text format, is shown below.

Figure.1 Image and Text Excerpt for *Walden*

Response to the image and text format included five participants who simply reproduced what the text in the image and text format said. On participant said that meaning of the excerpt was "the same as the text only excerpt." One participant said the image and text excerpt had as its main idea, "accepting life's obstacles" and that the trail in the image "is a metaphor for life." One said the image and text meant "happiness can come from anything" and another thought "going with the flow" was crucial. Perhaps based on the last page of the excerpt, four participants mentioned missing animals as part of the main idea.

In terms of tone, participants thought the excerpt sounded: sad, more light hearted and informing, seeking, depressed, sad, somber, melancholy, calm, determined, timid, curious, and nostalgic. Among these, two participants thought the excerpt sounded depressed and one, somber. Five participants thought the tone was sad, and one thought it sounded "almost sad."

Figure 2 shows the cells used for the image only format of *Walden*.

Figure.2 Image only excerpt for *Walden*

For the meaning of this excerpt, three female and two male participants simply rehearsed, cell-by-cell, what the images physically portrayed. Of these, all five were 18-21. Eight mentioned the owl as significant. Three mentioned nature and four mentioned friends as central to the main idea. One participant said that the meaning of the excerpt was that two different species could peacefully coexist. Other participants found "happiness," "entertainment," and "being at ease" as descriptive of the meaning of the image sequence. One summarized the group of images as "a sad man pondering thoughts."

In terms of tone, participants used words such as inquisitive, peaceful, playful, whimsical, relieved, lost, happy (3), calm (3), relaxing (2), sad, warm, and friendly to describe what they were seeing.

When asked which format they preferred, all but three of the participants chose text and image as their preference. Two chose text only, saying that it was easier to pick out meaning from the text because there were no images to influence thought processes. (One of the two participants preferring text only here was the female who self-identified as having a learning disability. She makes a similar comment when she talks about the second excerpt.) One participant, the minority student, chose image only. For her, the images were clear enough and made a good focal point for her thinking.

Of those fifteen choosing text and image, comments included observations like, "Text and a visual aid makes it easier to understand what the excerpt is about; you have two ways to understand it." "Because it was not text heavy but provided me with enough information to stay interested." "It was easy to understand with short blocks of text and pictures." And, simply, "Because I do better with pictures and words."

3.2 *Nausicaä*

The text only version is the prologue for Book I, as follows:

In a few short centuries, industrial civilization had spread from the Western fringes of Eurasia to sprawl across the face of the planet. Plundering the soil of its riches, fouling the air, and remolding life forms at will, this gargantuan industrial society had already peaked a thousand

years after its foundation: ahead lay abrupt and violent decline. The cities burned, welling up as clouds of poison in the war remembered as the seven days of fire. The complex and sophisticated technological superstructure was lost; almost all the surface of the earth was transformed into a sterile wasteland. Industrial civilization was never rebuilt as mankind lived on through the long twilight years. *Nausicaä of the Valley of the Wind*

For the meaning of this excerpt, sixteen participants mentioned the aspect of the destruction of civilization through industrialization and war. One male linked the destruction specifically to Western civilization. One participant mentioned "broken dreams" as part of the destruction. Two female participants found the prologue "boring" and said little else.

For the tone, participants named the excerpt both positive and negative, as well as depressing, disappointing, scholarly historical in its accounting, factual and depressing, dramatic and characterized by storytelling, sad, concerned, grave, ominous, threatening, informative, and crippling.

Figure 3 shows the cells used for the image and text only format of *Nausicaä*.

Figure.3 Image and text excerpt for *Nausicaä*

For the meaning of this text and image excerpt, participants thought that there was foreshadowing in the selection, and used terms like "girl's destiny," upcoming war, plan of action, saving the Princess, an upcoming journey, and terrible things coming in their interpretation. One participant saw "looking for things" as part of the meaning. More literal, one participant noted that a creature

was killed that should not have been, while another participant offered a literal interpretation, saying "the Dork's captured an Ohmu."

In terms of tone, participants used words such as serious (2), adventurous, worrisome, wonderment, dramatic, suspenseful, conniving, unnerving, mysterious, tradition, heroic, assertive, hopeful, determined, urgent (2), and call to action.

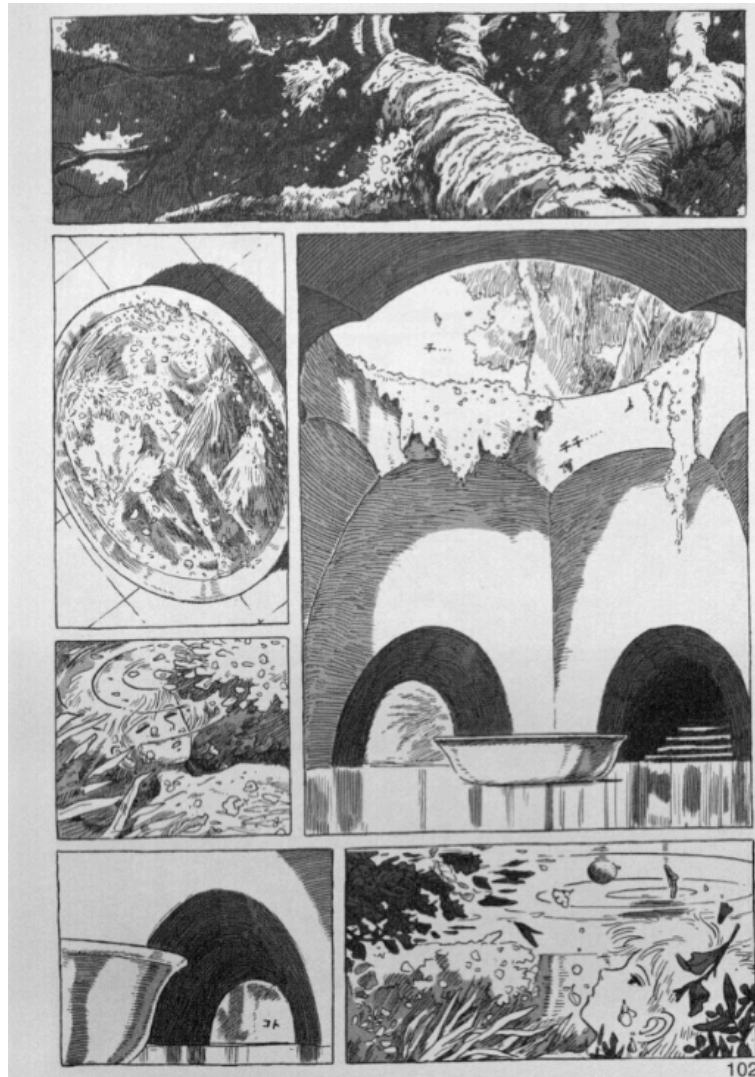Figure 4 shows the cells used for the image only format of *Nausicaä*.

Figure.4 Image only excerpt for *Nausicaä*

For the meaning of this excerpt, participants offered such judgments as "vantage points," "peace with nature," "an asteroid collision ruined and killed," and "civilization." While one participant, evidently having read the book, asks "Isn't Nausicaä being cleansed from the poisonous gas by the water?", two understood the idea of regeneration being part of the meaning. One thought a person was in a sanctuary, hiding under water, while another participant thought someone was being reborn.

In contrast, fully one-third of the participants thought the heroine was drowning or dying in the sequence.

In terms of tone, participants used words such as "graphic and alarming," "refreshing," "quiet," "surprised," "relaxed," "peaceful," suspenseful," and "calm." One participant observed that the calm in the image only sequence was especially strong, because the character is submerged, which dulls her other senses. He adds, "I can feel the muffled noises if I were under water." Three participants found the image "sad." A different three participants disengaged from the excerpt with comments like "N/A," "unknown," and by leaving the response blank.

When asked which format they preferred, five participants, all female, preferred the text only format. One stated, "I was able to gather my own imagery, which was much more broad because once again I didn't have other images influence my imagination." These participants found that the imagery alone was not enough or that too much was going on in the text and image format. Three females and two males preferred the text and image format. One said she liked this format because she had experience reading manga and found it easier to understand what was going on. One female liked the text and image, but found it initially difficult due to its right to left orientation. Six preferred image only. One said, "I got a better feeling for the tone from the image only format." Others found the right to left sequence easier to read when in image only. Those preferring the image only format also said that everything else was text heavy which caused a loss in interest. Two participants refused to select a preference.

4. Conclusions

Conclusions from this study entail those related to the research process, those related to participant responses, and those related to the significance of the research.

4.1 Research Process

My research experience for this paper on this particular subject suggests that getting access to participants can be especially difficult when involving participants with disabilities. Having appropriate, established affiliations at each research site is thus critical for Institutional Review Board approval and can involve unexpected requirements, even if the researcher has included such participants in past research.

On another front, having a survey online using Qualtrics, which seems a better choice than Survey Monkey for this project, involved difficulties in presenting text and image formats, because the type in the examples became simply too small to read and, thus, one excerpt set had to be eliminated.

In addition, mixing manga and American sequential art appeared to confuse participants when it came to reading sequences. Even though the manga was clearly labeled "read from right to left," many students did not. Thus, participants reading the text and image shown in Figure 3 saw the prophesy for Nausicaä's decision to travel to dangerous territory before seeing Nausicaä's decision to do so. This difference in sequence causes a slight difference in emphasis. In the manga sequence, Nausicaä's behavior, which seems at first foolish or at least naive is, on the next page, interpreted as evidence of her fulfilling a prophesy. In the left to right version,

the reader knows Nausicaä is linked to the prophesy before she acts. In the narrative. It's a subtle difference, but participant-readers can feel the same anxiety for Nausicaä as her companions do when the narrative is read in manga order. Thus, to retain the original sequence of events, more dramatic call-outs seem necessary when dealing with sequential art written in right to left manga order.

4.2 Participant Responses

Preferences for formats varied with the source selection. For *Walden*, a clear majority (all but three) preferred text and image format for its clarity. For *Nausicaä*, the preferences were evenly split for text only, image and text, and image only formats. One surprise in the data was that the self-identified, learning disabled student preferred text only for both selections. She found she could create more vivid images mentally and, therefore, found the given images in other formats intrusive and annoying.

In terms of determining the meaning of each excerpt, an unexpected number simply tried to put the images into words when presented with image only formats. In addition, for each format, there was a tendency among participants to prefer the concrete explanation of meaning to an abstract rendering. So, comments like "he is going out into the woods" far exceeded those saying "the trail is a metaphor for life," and comments like "the girl is drowning" exceeded those saying "there is a rebirth."

Assessments of tone tended to more uniform for *Walden* than for *Nausicaä,* with most seeing sadness in *Walden* instead of contemplation. For *Nausicaä,* assessments of tone were more varied, which might relate to the unfamiliar manga sequence of the narrative. Perhaps participants simply were having trouble find their feet.

Future research might involve more targeted testing, such as having some instruction on the generic meaning of the shapes of text balloons and their influence on tone, with subsequent survey excerpts clearly using these conventions to indicate the tone of the utterances. In addition, a short, written explanation, written by the researcher that would provide context for the examples could precede the excerpts. In the current survey, the text only excerpt provided such context, but more might enhance student engagement with the copy.

4.3 Contribution of research

This paper establishes a baseline for researching the possible use of sequential art to aid reading, especially for those with learning disabilities such as dyslexia and autism. The paper also suggest further research such as:

1. Entire studies devoted to specific genre conventions in sequential art to see how each affects meaning making in student participants.
2. A formal comparison of the affects of traditional Western order versus manga order on meaning making for various participant groups.
3. Research that has access to participants with specific learning disabilities and that features the affect of sequential art on meaning making for each.
4. A comparison on the value of sequential art to various writing tasks for various readers, such as providing instructions, conveying philosophy, capturing classic literature, or providing information, such as in health care settings.

This paper is part of a new but growing body of research on graphic design and disability studies; it is unique in its focus on graphic novel conventions.

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