



THE RELATIONSHIP BETWEEN MATERIALITY AND EMOTIONAL RESPONSE FROM INTERACTIVE BOOKS

A RELAÇÃO ENTRE A MATERIALIDADE E A RESPOSTA EMOCIONAL A PARTIR DE LIVROS IMPRESSOS INTERATIVOS

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Abstract

This study aims to observe how a book's materiality could influence the emotional response of the reader. In this study, modifications of a book design were mapped to multiple interpretations in the expressed emotion of the story text. Nick Bantock's book, "Griffin and Sabine: An Extraordinary Correspondence" was digitized and given alternate endings by modifying the graphic elements of a few final pages of the book. However, the text was not altered in any way. The readers were asked to describe their emotions using the PrEmo toolbox (Desmet, 2009) and responding to questions about the story they observed. Although most of the participants did not highlight the graphic elements as an indicator of their interpretation, we identified that some interventions in design could express different interpretations.

Keywords: Design, materiality, emotions, book.

Resumo

Este estudo tem como objetivo observar como a materialidade de um livro pode influenciar a resposta emocional do leitor. Para isso, foram analisadas diferentes interpretações que podem surgir a partir de modificações nas ilustrações do livro de Nick Bantock, "Griffin & Sabine: uma correspondência extraordinária". Ele foi digitalizado e recebeu finais alternativos através da modificação de elementos gráficos das páginas finais do livro, sem alterar o texto. Os leitores foram solicitados a descrever suas emoções usando os indicadores da ferramenta do Design Positivo PrEmo (Desmet, 2009) e responderem a perguntas sobre o que observaram na história. Embora a maioria dos participantes não tenha destacado os elementos gráficos como um indicador de sua interpretação, identificamos que algumas intervenções realizadas conduziram a diferentes interpretações emocionais.

Palavras-chave: Design, materialidade, emoções e livros.

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1 Introduction

Designers are often concerned with expressive content of a design, however there is little known about how audiences interpret the design. Particularly, it is not clear how graphic elements in a design could alter the perception of the audience about the expressed content. In this paper we study how altering the context of a story can affect emotional responses from the reader.

Following one of the perspectives of Positive Design (Desmet; Pohlmeier, 2013), can our designers modify the book to trigger specific emotions in the user? To answer this question, we proposed four prototypes using Nick Bantock's book, "Griffin and Sabine". In order to optimize access to the experiment, four digital prototypes versions of the book were created. We created three versions based on the original text which we used as a control. Each of the three altered ending prototypes had alternative stories concepts without changing the text. By only changing the materiality of the illustration on the last pages we will verify the emotions evoked by each ending, to see if altered graphic material have the power of change the story. The prototypes will be compared to the original book to verify if there was significant change in emotions.

2 Literature review

There are a great many studies on the value of books in society and the inherent credence books provide text authoritative source (Dewey, 1899, Barthes, 1975, Healey, 2005, 2006). Book design has long established heuristics that help users become immersed in the text and at the very least guidelines that allow for easy reading. The penultimate goal of book designers though is to support the text in the best way possible to keep the reader engaged and experience the text as it was intended by the author. Within fiction this means readers should be free to experience the emotional cues presented through the use of words and the design of the book in unison. To narrow the focus however, we examine texts that invite physical interaction to evaluate the potential of haptic reading on emotions. The analogies Kahn and O'Rourke draw between object-based learning and enquiry-based learning highlight the use of objects as stimuli to investigate one's own personal preferences of a subject through a process of experiential learning (Kahn, O'Rourke; 2005). As we experience the world through the sense of touch, we establish a more concrete understanding of the world by, "strengthening the cognitive bonds between the information acquired during the learning process" (Tiballi, 2016). This falls short of our objectives to

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learn about emotions evoked by the interaction through the design of books and only explains how objects impact how we learn.

It was only until Darwin's 1872 book on emotional expression where photographs were used to illustrate the facial features of humans and used for reference to understand expression. The importance of the book was in part due to tying text, object (realistic photos) and comprehension together. Theatre plays similarly deal with text, objects (theatre sets with actors) and comprehension offer a type of simulation found in novels and plays. These text formats bring to life through simulation, a powerful identification we have with the characters. We live their goals, aspirations, and experience their emotions as if we are surrogates for the character (Oatley, 1994). Readers of novels and audiences of plays may witness events that they themselves have experienced or relive emotions stirred by memories identified through the written or spoken words. Connections between fiction and the emotions derived from it can allow readers to examine aspects of themselves which can affect their personal beliefs and values.

The materiality of the book could be associated with the material that the book is made from or its finished form. Gumbrecht (1998, pp 359) emphasizes that exist the sensual qualities of the book, which the reader can understand the signifiers of language that "transcend their traditional function of conveying meaning", even in a silent reading the reading has a rhythm suggests by the text and layout. Additionally, the illustration indicates the input utilized by the illustrator. Through textures and optical illusions, they simulate different materials that could add a new layer of meaning. Based in Sophie Van der Linden (2011) is visible how the illustration matter for the final signification of the story. Analysis of emotions evoked verify if was possible to interfere in the emotion suggested by the text through the materiality.

Van Der Linden (2011) approaches illustrated books through the relationship between the text and the image. She goes on to explain each element of the book from the text, the narrative aspects, and the images from the perspective of function. This function can change based on the dominance factor of the book. For example, the text may dominate through hierarchy or contrast to the image. Conversely, image can also be the dominant elements only supported by the text or narrative structure. For her, the image and the text could have the same value of importance to the story, sometimes the illustrations tell more details about the story, and other times the text is richer. To a better understanding we will treat as the first instance the one that has a major hierarchy in the page, and second instance the other, remember that these elements could be the text or the image. Linden (2011¹) explains that the image could have different function together with the text:

¹ our translation.

- a) could repeat the same message, exploring the redundancy. This could be done through the *repetition function*, that occurs when the message is repeated in both languages (text and image); or through *selection function*, that occurs when the second instance mentioned just a few elements of the first instance. If the text is the second instance, it will emphasize specific elements of the image; if the image is the second instance, it could concentrate in one aspect or viewpoint of the narrative, or choose one of the possibilities of sense in a polysemy text (Linden, 2011, p.123);
- b) could complement or expand the gaps, collaborating with the text: using the function of *revelation* or *completive*; The *revelation function* occurs when the second instance reveals a specific point of the first instance. In this kind of relation, this reveal element becomes indispensable for the understanding of the story. The *completive function* occurs when the second instance intervenes in the first one, given the opportunity of a complete meaning. In this case, one part completes the other, given information that is missing;
- c) could traverse the contradiction with the text, with the functions of *counterpoint*, and *amplification*. The *counterpoint function* occurs when one instance confronts the other. This could happen when in one of the instances is missing a central element of the other or contradicting this one. The *amplification function* occurs when the second instance expands the idea of the first instance. In this case, does not happen a contradiction or repetition, it is like one main idea works as an inspiration for other details. In these different functions, both languages (text and image) might be used to make a message stronger or weaker, to suggest distinct paths for the story or to confuse the reader.

3 Methodology

The book chooses for the experiment was Griffin & Sabine (Figure 1). The book was published in 1991, it was the first of a trilogy². The book's concept was avant-garde, because of the form with the interactive letters and the target public, the adults. In the book, the story is told through the correspondence exchange between Griffin and Sabine. The novel is surrounded by a surreal universe. Sabine knows Griffin's drawings for her dreams, and they start to exchange letters and postcards. For the creator, Nick Bantock

² The first book is *Griffin and Sabine: An Extraordinary Correspondence* (1991), the second *Sabine's Notebook: In Which the Extraordinary Correspondence of Griffin and Sabine Continues* (1992); and the third *The Golden Mean: In Which the Extraordinary Correspondence of Griffin and Sabine Concludes* (1993).

(Medley, 2016)³, the story “It’s initially, obviously, a love story, but it’s also a mystery, a pursuit of self-understanding, a passion masque, a struggle to awaken, a hero’s journey, or two, a chess match with darkness, a sensual dance with duende, and an alchemical marriage.”

Figure 1 - Picture of Griffin & Sabine’s book, showing the interactive letter.



Source: <http://blog.upstatefancy.com/underrated-book-griffin-sabine/>

We chose the book because its ending is open to interpretations and the effect of design could be more perceptible. We modified the design of last pages of the book without altering the original text. To a better understand, the book’s versions will be explained in the follow items (4.1, 4.2, 4.3 and 4.4). We invited Design students to participate, because they might have a better perception of the design elements related to their interpretation. The twenty-two participants were divided in three groups, each one receive a modify version of the story. The participants were introduced to the physical original book but were not exposed to the last pages, then they received a digital version of the book with the modified endings for a second reading. The application with digital prototypes was based in the literature from Jung et al. (2011) and Robles & Wiberg (2009), who indicates that simulated materiality in digital projects also has an impact in the users.

After the participants read the book, they responded a few questions in Google forms. we asked some identification questions, as which version they read and if was the first time that they read that book. All the participants were reading for the first time. Then, we started with the warmup questions, to help them to re-think about the story before asking about the emotions. This approach was chosen because the emotions is a subjective field, if this would be the first question could indicate some feelings that were not the real feeling, just an impression. The warmup questions were: “What is your interpretation of the book's outcome in this reading?”; “What is your interpretation of each character's emotion at the end of the story?”; “What was the reason/clues for your interpretations?”.

To evaluate the reader’s feeling about the altered ending of the book we adapted the tool Product Emotion Measure (PrEmo) to be used meanwhile they responded our questions about the story (Figure 2). PrEmo is a non-verbal tool developed by Peter Desmet and improved by Caicedo (2009), instead the people describe their emotions, they choose a character that better represents their opinion about the product (Desmet, 2002). The tool

³ The author was interviewed by Mark Madley at 2016.

was tested across cultures and does not require text. In the cartoons is possible to identify the emotional expressions, represented by faces, hands, and body. PrEmo shows 12 emotions, six positive and six negatives. The six positive feelings are desire, satisfaction, pride, hope, joy, and fascination, despite the negative ones are disgust, dissatisfaction, shame, fear, sadness, and boredom. Following Caicedo (2009) suggestion, we reduce the scale to rate the emotions to a “3+1” scale equivalent to ‘Felt it Strongly’, ‘Felt it Moderately’, ‘Felt it lightly’ and ‘Did not feel it’” (Caicedo, 2009, p. 21).

Figure 2 - Feelings represented in PrEmo



Source: Lokman et al., 2013, p. 736.

4 Griffin and Sabin's book

In Griffin and Sabin the images have – at least – a complete function (Linden], 2011). Because you read the stories through the corresponding between the two characters, and you know that they are postcards and letters because of the way that they are visually presented. At the end of the book, they indicate that all the corresponding was found at Griffin's studio.

4.1 Version 1: the original story

In the image we show the original ending where Griffin wrote to Sabine saying that he does not believe in her anymore, he thinks that she was created by his imagination because of his loneliness and give up to go meet her physically (Figure 3). The image of the postcard's front is very confusing, dark, and abstract. The image of the back of the postcard indicates that the postcard was not sent, because does not have the stamps of the post office. Although the postcard was not sent, Sabine answers his message, telling him that if he will not go, she goes to his encounter. Her postcard neither has stamps of the post office. The image of her postcard is a skeleton with butterfly wings, the background is light and the wings are colorful. This image has a dark frame and a red rectangle cut in the middle, in each position is put in one side of the picture. It looks like the image of the winged skeleton is emerging of the darkness. The interpretation of these images, in one hand, could lead us to an understanding of hope. In another hand, could be a death angel indicating that Griffin is so depressed that he might kill himself.

Figure 3 - Version 1, original ending - postcards without stamp.



Source: Adapted by the authors, 2019.

The end of the book is open, it does not give to you answers, but questions: How Sabine's letters (sent by Griffin) stopped there? Sabine goes there with all letters that Griffin sent to her, how does she answer his postcard if he never sent? Does she understand his silence as an answer? Do they really meet after the end of the book? In this ending, since they do not have stamps, we could say that this missing element is a counterpoint. Because if you read only the text, you would assume that the postcard was sent, but the image indicates that was not.

4.2 Version 2: the added stamps postcard

In the second version (Figure 4), we add the stamps in the postcards (In the Sabine' postcard is more discrete in the version, for nor interfere so much in the image). To Reinforce the complete function of a text and accompanied image during the whole book, or to express a repetition function. This intervention could indicate whether a reader is curious about the repeated visual elements in the book design.

Figure 4 - Version 2, added stamps to the postcards. Enlarged added details.



Source: Adapted by the authors, 2019.

4.3 Version 3: the rebuild Griffin's postcard

In version 03, the postcard was ripped and reconstituted with adhesive tape. And we add a bigger postage stamp in the Sabine postcard (Figure 5). The act of torn could indicate that Griffin really regrets to write and believes that he is crazy and is sending letters to someone that he invented. The fact that is rebuilding with adhesive tape could show that he regrets of torn and rebuild it. When he rebuilds maybe Sabine could see the postcard in her dreams, like she saw his drawing. Or Sabine went to the studio and rebuild to read what he wrote. Would be too late for them?

In this case, the image could be an amplification of the text because in the text it is showed his doubts and confusion about this relationship, the act of torn could be an action because of these thoughts.

Figure 5 - Version 3, Griffin's postcard was ripped and rebuild with adhesive tape; Sabine's post with added stamp. Details of altered image.



Source: Adapted by the authors (2019).

4.4 Version 4: Sabine's postcard ripped

In version 04, we let the original card of Griffin, without stamps, and change Sabine's postcard for a wrinkled and torn version (Figure 6). In this case, maybe Sabine could have lost her hope with Griffin, and give up sending to him. Or Griffin was so sad and disappointed that he destroyed her last card, to end with that.

Both images represent the function of counterpoint because as was written before, Griffin indicates that he will send the card in the text, but he did not send. And Sabine's postcard is written with hope and reconciliation, she is going to him, so this does not match with the wrinkle and torn postcard.

Figure 6 - Version 4. Sabine's postcard was ripped.



Source: Adapted by the authors, 2019.

5 Results and discussions

In order to perceive the observation of the participants about the materiality, we asked about the reason/clues for their interpretations, to see if they would point out some of the illustrations details. However, when the participants explained their interpretation, the majority talk about the story, rather than the visual content and design. But proportionally with the strength of the contrast of our interventions in design with the previous pages, the materiality became more notable in their answers. In version 02 the postcard has the same visual design as the original and we add a stamp to the envelope. We hypothesized that such intervention could alter the reader's curiosity about how Griffin has not posted the

postcard and yet received a response from Sabin, however no one questioned that. In the version 03, we tore up the postcard and stuck together with tape the postcard with tape, to imply that Griffin was not content about sending the letter but changed his mind later. In this way the size remains similar with the previous, but the texture was different, in this group 2 of the 8 students pointed this card or the art style as an indicator of their interpretation. In the version 04, with the ripped card divided into two pieces, different from the others in the book, breaking the visual rhythms book, in this group 4 of the 6 students pointed this card as the main reason of the interpretation.

Although most of the students, in general, did not mention the materiality, the interpretation and the feelings follow different patterns for each version. Many of the students interpreted the story as a sad story, that Griffin was with depression. However, the version 02 provoked the interpretation of a kidnap, that Griffin mysteriously disappeared because of a major force than him, whereas in version 03 and 04, the indication of depression or mental illness was more recurrent, and the students believed that Griffin might commit suicide. Moreover, in all versions a group of students pointed out that Sabine was invented by Griffin because of the loneliness that he felt.

To do a descriptive analysis of the answers about the emotions card, we use the values between 3 and 0 to the identity, correspondingly, the answers 'Felt it Strongly', 'Felt it Moderately', 'Felt it lightly' and 'Did not feel it' (Caicedo, 2009, p. 21). Version 02 was read by 8 students, the Version 03 by 8 students and the version 04 by 6 students. As each group receives a different of participants, after to sum the values of each emotion, we divide this result by the number of participants in each version. With the purpose to be easy to analyze we made a second calculation where the values related to the positive emotions the minor value would be 0 and the major would 1. And, for the negative emotions, the minor also would be 0, but the major one would be -1.

Chart 1 - Positive Emotions evoked by the different versions. Values: 0 to 1.

Version / Emotion	Desire	Satisfaction	Pride	Hope	Joy	Fascination	Total
02	0.46	0.13	0.25	0.17	0.21	0.46	1.67
03	0.42	0.21	0.25	0.17	0.29	0.58	1.92
04	0.22	0.06	0.06	0.39	0.06	0.33	1.11

Source: Authors.

Chart 2 - Negative Emotions evoked by the different versions. Values: 0 to -1.

Version / Emotion	Disgust	Dissatisfaction	Shame	Fear	Sadness	Boredom	Total
02	-0.04	-0.13	-0.25	-0.42	-0.21	-0.08	-1.13
03	-0.08	-0.17	-0.17	-0.33	-0.42	-0.08	-1.25
04	-0.11	-0.22	-0.28	-0.44	-0.22	-0.22	-1.50

Source: Authors.

Chart 3 - Balance between positive and negative emotions between the versions

Version / Emotion	Total Positive	Total Negative	Balance
02	1.67	-1.13	0.54

03	1.92	-1.25	0.67
04	1.11	-1.50	-0.39

Source: Authors.

The emotions evoked in a general way was Desire, Fascinations, Fear, and Sadness. Besides the book was interpreted with a sad feeling, the students really enjoyed the book's format, with the letters and the mix of visual art with the text, what was possible to see after the reading and observing that the majority indicate in some level the Fascination feeling. *Version 02* and *03* had more positive emotions evoked than negative ones. But they also had a high number of negative emotions evoked. *Version 4* had more negative emotions evoked, than positive ones. We could interpret as the ripped card of version *04* might be the reason to emphasize the negative outcome, because it is the index of an action making with a strong negative feeling.

Version 2 (with the added stamps) evoked more positive emotions than negative. The emotions chosen was Desire (0.46), Fascination (0.46) and Fear (-0.42), followed by Pride (0.25), Shame (-0.25) and Sadness (-0.21) and Joy (0.21). In this variation, some readers interpreted as Griffin been kidnapping ("I believe a person, or some type of physical force may have kidnapped Griffin"). One of the readers mentioned that he based his/her interpretation in the text, but "The images were a nice touch that gave a feeling of that added meaning to the text itself." Also, the Griffin was interpreted as a depressive person and Sabine as a willing person that could save him. Eight students read this version.

Version 3 (with the rebuild Griffin's postcard) also evoked more positive emotions than negative ones. But the positive emotions were Fascination (0.58), followed by Sadness (-0.42) and Desire (0.42), Fear (-0.33) and Joy (0.29). In this reading, the students mentioned suicide, loss of sanity, and that the story consumed them both. Eight students read this version. In this version, the postcard's materiality was indicated as a reason for them interpretation: "At the beginning of the story, none of this was evident. It was only after he got the postcard from Sabine that he started to encounter this which Griffin states in the last postcard."

Version 4 (with Sabine's postcard ripped) evoked more negative emotions than positive. The emotions mentioned Fear (-0.44), followed by Hope (0.39), Fascination (0.33) Shame (-0.28) and with the same value (0.22) had Dissatisfaction, Sadness, Boredom and Desire. Six students read this version. They mentioned the lonely and depressed. And attributed the ending with the lonely: "That this is what happens when you go lonely." In this version, four of the students attributed the interpretation to "the tone of the postcard changed and the ripped postcards."

In an attempt to capture the emotional state of each participant we hope to set the stage of Griffin and Sabine with the same beginning and middle of the story but propose possible endings based on their emotional preference rather than their preferred outcome. In documented studies on emotional behavior, preservation or improvement of our emotional

state are incentives to motivate change or keep the status quo. If we believe we are content with our emotional state, we will adopt an avoidance strategy toward anything that may change our mood. Conversely, we will seek out changes to improve our emotional state if we determine our mood to be negative. Sinclair (1988) attributed these findings to differential processing strategies, in that sad participants' decreased rate of halo errors and fundamental attribution error, follows from their use of careful, systematic processing. This is not to say that some form of affect processing does not occur in happy people rather adherence to the empirical generalization that happy processing is cognitive and sad processing is perceptual (Clore; Storbeck, 2006) remains valid. These emotional states although simplified are markers for positive and negative emotional categories. The process of text comprehension and haptic interaction effects the cognitive and perceptual processes, in turn clustering positive and negative emotional participants toward a similar mood response.

6 Final considerations

We studied how altering materiality in design of a book could change the expressed feeling of a story. Our study found that changing the intensity of expression in designing the visual content of a book could alter the interpreted emotion of readers. As the students were from the Design field, we expected that more students would point the materiality and the drawings styles on the postcard as a reason of them interpretation, but the text seems to be very strong, because the visuality was mentioned when have a big interference, breaking the rhythm of the book. The quantity of students that pointed the depression in Griffin's character also could indicate something about the students. The original book has an open ending, this could be a facilitator to the materiality indicate in a more subjective way the book's outcome. In a future study, would be better a shorter story to make the interferences, besides to do with a major group.

Collaborators

All the authors collaborated to the conception of the study, the analysis and interpretation of data, and in the review of the paper. Thaís Sehn and Gerry Derksen also worked at data collect, modifying the illustrations, preparing the instruments, and applying the questionnaires.

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