

Children's Cognitive and Affective Responses About a Narrative Versus A Non-Narrative Cartoon Designed for an Active Videogame

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Abstract

Objective: This article presents the results of interviews conducted with children regarding their cognitive and affective responses toward a narrative and a non-narrative cartoon. The findings will be used to further explore the role of a narrative in motivating continued active videogame play.

Materials and Methods: Twenty children (8–11 years old of mixed gender) watched two cartoons (narrative and non-narrative) and were subsequently interviewed. A thematic matrix was used to analyze the interviews.

Results: The narrative cartoon ($n = 11$) was only slightly preferred compared with the non-narrative one ($n = 9$), with little difference among the participants. The theme categories identified during the analyses were plot, characters, and suggestions. The fight scenes were mentioned by the children as a likeable aspect of the narrative cartoon. In the non-narrative cartoon, the vast majority ($n = 17$) liked the information about physical activity that was provided. The children enjoyed the appearance and personalities of the characters in both cartoons. A discrepancy in the data about the fight scenes (narrative cartoon) and characters (both cartoons) was found among the female participants (i.e., some girls did not like the fight and thought the characters were too aggressive). However, most of the children wanted to see more action in the story, an increase in the number of fight scenes (narrative cartoon), or more information about exercise and examples of exercises they could do (non-narrative cartoon). They also suggested adding a game to the non-narrative cartoon, including more characters, and improving the animation in both cartoons.

Conclusions: The children preferred the narrative cartoon because of the story and the fight. Some gender differences were found, which further studies should investigate.

Introduction

ACTIVE VIDEOGAMES (AVGs) COULD become a way of increasing physical activity (PA) and lead to promising health outcomes for children.^{1,2} In 2009, a typical U.S. child lived in a home with an average of 3.8 televisions and 2.3 videogame consoles.³ Eighty-seven percent of children 8–18 years old had a videogame console at home, and 50 percent had one in their bedroom.³ African American and Latino children played the most videogames³ and were more likely to be overweight or obese than non-Hispanic whites.^{4–6}

Although AVGs could be a potential means of preventing childhood obesity by increasing children's PA,⁷ children's motivation to play AVGs rapidly decreases over time.^{8,9} Narratives, alternatively, could enhance and sustain children's

motivation to play AVGs, by significantly impacting their cognition¹⁰ and behavior¹ through "transportation," their unique immersive quality that enables the suspension of disbelief, instills vivid personal experiences, and helps to create a deep affection for the characters.¹¹ Once a player is fully immersed in a narrative, he or she may withhold counterarguments in order to not destroy the pleasure of the narrative immersion. If the audience personally experiences the narrative, that experience could be incorporated into a memory to be performed later as a health behavior. Identification with characters might also lead the player to adopt or imitate the character's attitude.¹⁰

All these elements suggest appropriately designed narrative could substantially impact AVG-related PA behavior; however, only 2 of 28 videogames for health included narratives.²

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Research on narratives is needed to identify what constitutes an appealing story,¹² what leads to a more immersive and engaging experience, with what type of characters children most identify,¹¹ and whether children enjoy narratives more than more traditional ways of delivering health information.

This article presents the results of interviews with children as formative research regarding their cognitive and affective responses to a narrative and a non-narrative cartoon, to be used as a backstory for an AVG. The findings of this study represent the first part of a larger study to investigate whether AVGs with well-constructed stories elicit desirable cognitive, affective, and behavioral consequences, such as longer play duration, more activity energy expenditure, and higher PA level than those elicited by non-narrative AVGs. The primary hypothesis of the present article was that children would prefer watching a narrative cartoon to a non-narrative cartoon that simply gave information about PA.

Materials and Methods

Twenty children, both girls and boys (equal numbers) from different racial and ethnic groups, were invited to participate in the study. Saturation of information was the criterion to determine the end of the qualitative data collection. In our experience, saturation is reached with 5–10 participants; thus 20 represented a conservative approach.

The inclusionary criteria were being an overweight or obese 8–11-year-old child (85th \leq body mass index percentile $<$ 99th) who was able to speak and understand English. Exclusionary criteria were children who had medical or physical problems that prevented their playing AVGs (such as epilepsy), who used orthopedic devices, or who were morbidly obese (body mass index percentile \geq 99th).

The Institutional Review Boards of Northwestern University and the Baylor College of Medicine approved the research protocols. Written informed consent was obtained from parents and written assent from the participating child. Participants received financial compensation.

The children watched two cartoons (one narrative and one non-narrative) and were subsequently interviewed by one of the authors. To avoid an order effect, the two cartoons were played to each child in random sequence.

The narrative cartoon (“The Door Which Is a Mystery”) connected events and characters. It began in a child’s bedroom; a magical door suddenly appeared, and the player was thrust into a strange world filled with stick people carrying swords. The door immediately disappeared. The player tried to befriend a passing stickman, asking “Where is the door back to my room?,” but instead of answering, the stickman attacked with a sword.

The non-narrative cartoon showed the character explaining the benefits of regular exercise and eating right (no particular food was specified). It also mentioned the consequences of not exercising like heart disease, obesity, diabetes mellitus, and high blood pressure. The character encouraged the player to be physically active by playing sports (at least 1 hour per day).

Each interview was conducted using a standardized script consisting of open-ended questions developed by the researchers (Table 1). Probes were used to expand and clarify responses. Children watched the two cartoons on a television set and answered questions after watching each clip. Sessions

TABLE 1. INTERVIEW SCRIPT USED WITH THE CHILDREN AFTER THEY WATCHED THE CARTOONS

Order	Question
1.	What do you think happened in the cartoon?
2.	What, if anything, do you like about the cartoon you just saw?
3.	Is there anything that you didn’t like about the cartoon?
4.	What would you think might make the cartoon better?
5.	What, if anything, do you like about the characters in the cartoon you just saw?
6.	What, if anything, do you not like about the characters in the cartoon you just saw?
7.	What do you think might make the cartoon more fun?
8.	What do you think happens next in the cartoon?
9.	How do you think the story will end?
10.	Which did you like more, the first cartoon or the second one? Why?

lasted between 50 and 60 minutes. Trained research assistants audio recorded each session and took notes as they interviewed each child.

At the end of the interview, the children reported their experience with Wii™ (Nintendo of America, Redmond, WA) games (on a scale of 1 = not at all familiar, 2–3 = some familiarity, and 4–5 = very familiar), how much they played Wii games compared with their friends (on a scale of 1 = much less than their friends, 2–3 = about equal to their friends, and 4–5 = much more than most of their friends), and how much they played Wii games (on a scale of 1 = little or no experience, 2–3 = some experience, and 4–5 = a lot of experience).

The interviews were transcribed verbatim by a transcription service. Transcripts were reviewed against the audiotapes for accuracy. Two of the authors (V.F.D. and R.M.) independently coded the data with NVivo (version 10.0, 2012; QSR International, Doncaster, VIC, Australia) qualitative software, using thematic analysis.¹³ The thematic matrix method included the following steps: rereading the transcripts to identify themes for the organization of data; indexing the themes within the transcripts; and removing data from the transcripts and transferring them to a matrix theme (each theme relating to quotes from the participants). The matrix included the main ideas and perceptions of the individual related to the theme. At the completion of coding, analyses were compared, discrepancies were discussed, and consensus was reached. To ensure the neutrality of the analysis, the two coders were unaware of the research questions or relevant literature.

Results

Participants’ demographic characteristics and experiences with Wii games are presented in Table 2. Most of the children were between the ages of 9 and 10 years, and most rated themselves \geq 3 on the scales related to time, experience, and familiarity with playing Wii games. These results show that the participants had some familiarity and experience with Wii games as well as spent similar time playing with this type of games.

The narrative cartoon was slightly preferred ($n=11$); nine participants preferred the non-narrative cartoon, indicating not

NARRATIVE VERSUS NON-NARRATIVE CARTOON

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TABLE 2. PARTICIPANTS' DEMOGRAPHIC CHARACTERISTICS AND EXPERIENCE WITH WII GAMES

<i>Variable, categories</i>	<i>n</i>
Gender	
Girls	10
Boys	10
Age (years)	
8	3
9	7
10	6
11	4
Compared with your friends, how much have you played Wii games? (On a scale of)	
5 (much more than most of their friends)	3
4 (much more than most of their friends)	6
3 (about equal to their friends)	7
2 (about equal to their friends)	0
1 (much less than their friends)	4
How much have you played Wii games? (On a scale of)	
5 (a lot of experience)	11
4 (a lot of experience)	4
3 (some experience)	2
2 (some experience)	2
1 (little or no experience)	1
How familiar are you with Wii games?	
5 (very familiar)	11
4 (very familiar)	5
3 (some familiarity)	1
2 (some familiarity)	2
1 (not at all familiar)	1

much difference. The reason the children liked the narrative cartoon was the story, which they thought made the cartoon more entertaining than the non-narrative. The fight scene shown in the cartoon was a strong point mentioned by the children. Other participants also mentioned they liked the characters:

Because I like action stuff a lot more than I like showing stuff...like the people in human body. (male, 10 years old)

Some children preferred the non-narrative cartoon more because of the information provided, which enabled the children to learn something:

Because they were giving me information about exercise. (female, 10 years old)

Three themes were identified: plot, characters, and suggestions.

Theme 1: plot

Three subthemes emerged from the main theme: plot characteristics that the children liked, plot characteristics that they disliked, and how children thought that the cartoon would continue and end. The story in the narrative cartoon was enjoyed by the children. For most of them the fight scene was their favorite part. However, three of the female participants complained that the story was too violent and thought the cartoon was more directed toward a male audience:

It was more of a boy cartoon for boys. (female, 11 years old)

In the non-narrative cartoon, the vast majority ($n=17$) liked the information they were given. There were even some

comments that they would like to watch more cartoons giving information about health:

I like how it's telling you about the pros of being healthy. (male, 10 years old)

In both cartoons, the children disliked the design quality of the animation:

I didn't like it when it showed them fighting, and they were just showing pictures of them, and they weren't actually moving their hands like that and swinging the swords up, down, right, left. (male, 10 years old)

Most children thought the narrative cartoon would have more fighting and that the story would either have a happy ending or end in the same way that it had started (i.e., with the character waking up from his dream in his bedroom). In the non-narrative cartoon, the children thought the cartoon would continue with more information on health subjects given by the main character, and they predicted this would continue to the end:

I think he's going to talk about nutrition. (female, 9 years old)

Theme 2: characters

In general, the children liked both the appearance and the personalities of the characters in both cartoons. However, they wanted to improve the clothes and the colors of the characters, as well as wanting more characters either to fight (narrative cartoon) or to talk about different health subjects (non-narrative cartoon):

Oh, what did I like about the characters? How they just kept on coming at him. They wouldn't give him any mercy...and the main character kept trying to reach his goal. (male, 11 years old)

That he didn't give up. (female, 9 years old)

I like how they had their own personality and how they looked really characteristic. (male, 10 years old)

I liked when he went out and he was, like, brave. (female, 10 years old)

Although most of the children were excited by the fighting spirit of the character, some girls complained about the characters in both cartoons being aggressive:

But I don't like the people that was mean to the other boy. (female, 9 years old)

In the non-narrative cartoon, several children mentioned that they liked the things that characters were saying (i.e., the information about PA).

Theme 3: suggestions

Suggestions to make both cartoons better included the story, characters, and animation. Most of the children wanted to see more action in the story (e.g., increasing the number of fight scenes [narrative cartoon] or giving more information about exercise and examples of exercises they could do [non-narrative cartoon]).

Although the fight scenes were a favorite and several suggestions were made about adding more fight scenes, some girls ($n=4$) wanted nonviolent alternatives:

If they can just all be friends and have a challenge, you know. Like if they want to have a spelling contest, who can spell the most words that use the word "sword." (female, 10 years old)

I'd make it so both boys and girls would like it. By adding things that girls might do or something like that. (female, 11 years old)

In the non-narrative cartoon increasing the action and increasing the entertainment were suggestions:

To put a little more fun in there. Maybe show muscles and funny pictures or something. (male, 10 years old)

Some children suggested adding a game after the character gives them information about exercise (non-narrative):

And then at the end, they could ask him to do a challenge game with fencing. (male, 10 years old)

The children also mentioned that they wanted more characters in both cartoons:

Different kinds of characters instead of just one. I would have a whole bunch of characters. (female, 9 years old)

They could have had different people. Just like different people to talk about different subjects." (male, 11 years old)

That there's only one person speaking, not that many people speaking. Have different people for different topics. (female, 9 years old)

In addition, children thought the animation of the cartoons could be improved:

I'd give the people arms. (female, 11 years old)

The animation could be more fluent, because it looked like you were just taking pictures and it was all stop-motion. If it was like most things, like commercials for games, their movements are more fluent instead of all stiff and all that. (male, 10 years old)

Discussion

A slightly higher number of children preferred to watch the narrative cartoon because of the story and the fight scene. The non-narrative cartoon was chosen as favorite because of the health information provided, as well as the fight. The fact the children preferred the narrative and the non-narrative cartoons in almost equal numbers may indicate that a combination of both cartoons could be most appealing (i.e., a dynamic plot combined with health advice). To our surprise most of the children did not perceive the non-narrative cartoon as something boring; indeed, most wanted to have even more health information. This may be related to the game context in which the narrative and non-narrative messages were situated. The fact that children were informed that the narrative and non-narrative messages were created for an AVG, a highly engaging medium for children, might make them less concerned with the qualitative difference between the two types of messages. Multiple studies comparing narrative and non-narrative health communication found only a handful of significant differences out of many outcome variables.^{14,15}

Because this study was a feasibility study, with only one episode of limited duration (3 minutes or less), it would be difficult to discover immediate differences between the two conditions. Similarly, the short duration of the cartoons would be difficult to induce central processing (according to the Dual-Processing Models for the non-narrative cartoon)^{16,17} or immersion (according to the Narrative Transportation Model for the narrative cartoon).^{18,19} Instead, the children might want the trailers to be longer than they were or actually embedded in an AVG. Future studies should

investigate the influence of multiple episodes of narrative as compared with non-narrative in the long-term play of AVGs.

The fight scene in the storyline was the most likeable aspect of the cartoons. The storyline, a fundamental part of a narrative, increases emotional and cognitive involvement.^{10,12,20,21} On the other hand, some discrepancies related to gender were detected. Some female participants commented that they disliked the fight scenes and the character's ruthless personality. It's possible that the negative perception of the plot and characters by some participants was related to personal experiences (e.g., bullying at school or domestic violence), which may have triggered a negative reaction to the narrative. Unfortunately, this possibility was not anticipated by the researchers, and the interview script did not incorporate in-depth questions about relevant personal experiences or possible trauma experienced. Future studies should investigate gender differences and personal experiences regarding plot and characters.

Today children are exposed to TV, computers, and videogames from an early age and are therefore used to high standards of animation. The participants in this study were critical of the characters' design and animation. They wanted more characters, and they noticed everything about them, including personality, tone of voice, colors, and clothes. Identification with the characters is crucial when using a narrative for health communication.^{10,12,22} People may pay more attention to the information presented and might even take on the role of the story's hero taking on the challenges in real contexts as a result of their increased motivation and sense of identity.^{11,23,24} An implication is that game designers and researchers should spend time trying to understand how to increase both the children's enjoyment and their identification with the story or characters, which could be key factors leading to healthy behavior when playing AVGs.

Transportation in the narrative world can lead to the feeling of being lost in a story, whereas non-narratives do not create alternative worlds for the individual to enter and may be less likely to lead individuals to experience emotions or to create mental imagery.²⁵ The addition of a narrative could foster strong intrinsic motivation to play AVGs by reducing cognitive load,^{26,27} engendering arousal and attention,²⁸ eliciting character absorbing players in an immersive fictional world,¹⁸ and promoting perceptions of PA as necessary and fun.^{29,30} Narratives may also encourage players in their role as actors to enhance and maintain their PA.³¹ Non-narratives, alternatively, provide direct instructions for behavioral modification and change. Narratives and non-narrative approaches should be compared in regard to promoting desired behavior changes, including measures of most likely mediating variables.

Most of the children in this study were able to describe the cartoon narrative in a very detailed manner (beginning, middle, and end). The children's comments about what they thought would happen and how the narrative would end were consistent with the plot (i.e., they did not disengage from the imaginary world presented to them). That could be a proxy measure of their immersion in the narrative. Future studies should investigate better ways of engaging children through narrative transportation. For example, the answers given by the children to the questions asked about how the story would continue and end could be used by the researchers to improve the narrative and increase children's identification with the

story and characters. An alternative would be to build a narrative step by step with continuous help from the children, thus producing a story tailor-made to their tastes and imaginations.

The children gave important insights for improving both the narrative and non-narrative cartoons. The active participation of the children, together with game designers, researchers, and story writers, shows that there is much to be learned from exploratory and formative studies for creating stories for AVGs. The children's feedback may not only help improve the quality of the narratives and games created, but also save time and money on effective intervention design.^{1,20,22}

The strength of this study was the use of two researchers to code the data who were also blinded to the hypothesis of the study. The limitation was the small sample, which did not permit finding subgroup differences in their preferences for the narrative and non-narrative cartoons. The principle of saturation guided the estimate of sample size, which worked well in regard to identifying the opinions of the children, who also offered their suggestions for improving the cartoons.

Conclusions

The children only slightly favored the narrative compared with the non-narrative cartoon. A combination of both a dynamic plot and health advice could be a strategy to influence children's behavior in AVGs and should be explored in future research. The insights provided by the children related to the plot, characters, and design in this study were valuable, showing that formative studies with this population about narratives and development of AVGs are crucial.

Author Disclosure Statement

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