

Brief report

'Me and my bunny': Narrative analysis of experiences with VR

Background

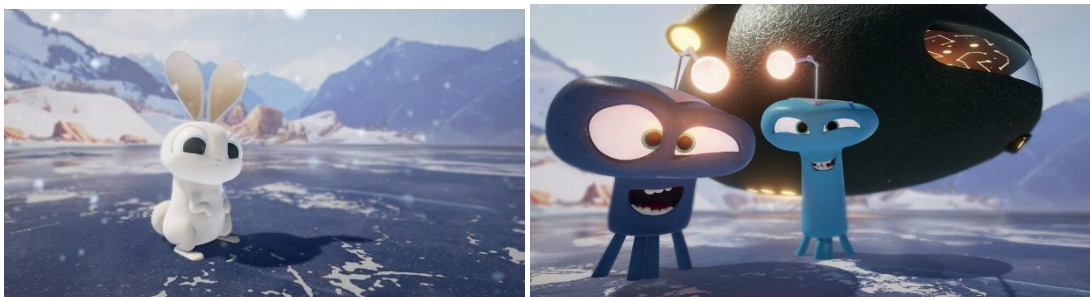
We recently conducted some research looking at adults' experience with VR, and how things like the platform used and the way viewers perceive their role in the story influence how they engage with narratives in VR. This write-up details one small part of that research, where we looked at the language people used to talk about the VR experience. Our interest in language and VR is informed by this quote from Tausczik & Pennebaker (2010):

Language is the most common and reliable way for people to translate their internal thoughts and emotions into a form that others can understand. Words and language, then, are the very stuff of psychology and communication. They are the medium by which cognitive, personality, clinical, and social psychologists attempt to understand human beings (25).

While we learned a lot about how people engage with narrative VR content using survey questions and direct observation (see Bindman et al., forthcoming), we thought it would be interesting to look at how people described the story they just experienced. We hoped that the way people retold the story they viewed in VR would tell us something about how they saw the story that would be difficult to obtain through other methods. This kind of narrative analysis has been used in educational settings (Cortazzi 2014) as well as in clinical settings such as speech-language pathology (e.g., Merritt & Liles 1989). Similarly, previous work has indicated that the language usage of people reflecting on their media experiences may be an indicator of personal connection to digital avatars (Banks & Bowman 2016).

Invasion!

We had 65 adult subjects watch a short narrative CGI video called *Invasion!* (Baobab Studios). The film is about aliens arriving on Earth and threatening a pair of snow bunnies, who ultimately thwart the aliens in a comedic way. The viewer sees the action from the perspective of one of the bunnies. It's a cute film, but it also puts the main characters in a dangerous situation; the aliens vaporize a passing hawk with a laser and threaten to do the same to the bunnies. Overall, viewers had a positive response to the film. We had viewers rate how much they felt certain emotions during the experience, and they rated the film particularly high for amusement, wonder, and excitement.



One of the bunnies and the aliens from *Invasion*. © 2016 Baobab Studios Inc.

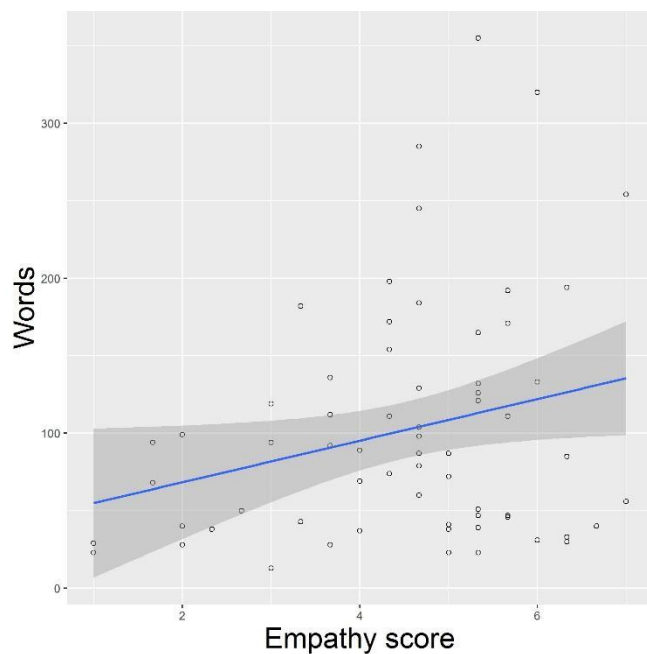
Here are 2 examples of the retellings people gave us:

So these two aliens visit Earth. They blew up like this hawk and they try to blow up me and a bunny. The bunny is kind of like buddies up with me and defends me. And gets them to get themselves in the ice water. And then they fly home.

Aliens come to Earth and land in a sort of arctic climate area and they land and disembark. And they are thwarted by a rabbit, after killing a hawk. That part threw me for a second. It was a comical mythos so it didn't feel terrible.

Looking at how talkative viewers were

In our discussions with teachers who use VR in their schools, some have noted that they can tell how engaged their students are with VR by seeing how much the students talk about it after they exit the VR experience. With the data from our experimental study, we were able to directly ask: do people who are more engaged with VR use more words to talk about it? We found that, while people who weren't particularly engaged in the narrative didn't use a lot of words, there was a lot more variability in how many words were used by people who really empathized with the characters in the story. So, overall, there was a relationship between number of words used and empathy¹ ($r=0.26$, $p=0.039$), and if someone used a lot of words to retell the story, that was a pretty good indicator that they were engaged with the story.



It does seem like the number of words a viewer used reflects more how they emotionally connect with a particular piece of content than how they empathize with stories in general. In other words, the number of words used seems to reflect *state empathy* rather than than *trait empathy*. The correlation between the number of words subjects used and their baseline empathy was low and not significant ($r=0.03$, $p=0.80$).

¹ Empathy was measured using the Emotional Engagement subscale of the Narrative Engagement Scale (Busselle & Bilandzic, 2008).

Looking at pronouns viewers use

One of our big findings from the larger experimental study was that, even though *Invasion* was designed for the viewer to see from a first-person perspective, only some people saw themselves as a character in the story. This was reflected, to some extent, in the language they used to describe the story. We did an analysis of the pronouns viewers used when they retold the story, based on the observation that, in computer-mediated communication, greater use of 1st person pronouns (such as *I* and *my*) are associated with greater presence, and 2nd person pronouns (such as *you* and *your*) are associated with lower presence (Kramer et al., 2006). People who thought they were characters were more likely to use 1st person pronouns than people who thought they were merely observers ($\chi^2=6.0819$, $df=2$, $p=0.048$), and were also more likely to use pronouns overall ($\chi^2=6.3707$, $df=2$, $p=0.041$; see table).

	<i>Perceived role</i>			<i>Total</i>
	<i>Character (1st person)</i>	<i>Observer (3rd person)</i>	<i>Other/ Not sure</i>	
Use of 1 st person pronouns (<i>I, my</i>)	14/26 (54%)	6/26 (23%)	7/13 (54%)	27/65 (42%)
Use of 2 nd person pronouns (<i>you, your</i>)	7/26 (27%)	3/26 (12%)	0/13 (0%)	10/65 (15%)
Use of either pronoun	17/26 (63%)	8/26 (31%)	7/13 (54%)	32/65 (49%)

Use of personal pronouns in the retelling task, by viewer's perceived role in the story.

What's more, it appears that the pronouns people used reflected how they engaged with the VR content. Pronoun usage was related to both presence² and narrative engagement³. Subjects who reported higher levels of presence were more likely to use 1st person pronouns in their retelling ($p=0.008$), and subjects who reported higher levels of presence also used 1st person pronouns more often ($r=.30$, $p=0.014$). Subjects who reported higher levels of narrative engagement were more likely to use 1st person pronouns in their retelling ($p=0.014$), and used higher numbers of 1st person pronouns ($r=.35$, $p=0.004$). Use of 2nd person pronouns did not appear to be related to presence or engagement, but was correlated with trait empathy⁴; viewers who used more 2nd person pronouns tended to have lower empathetic tendencies ($r=-0.27$, $p=0.031$).

² Measured using the Presence Questionnaire (Witmer & Singer 1998).

³ Measured using the Narrative Engagement Questionnaire (Busselle & Bilandzic, 2008).

⁴ Measured using the Compassion Scale (Pommier & Neff, 2011).

What we've learned

In short, we did learn something about how viewers saw themselves in the VR narrative by looking at the words they used when retelling the story. The number of words viewers use to retell a story seems to be related to how much they empathized with the story characters. While any single instance of the word *my* may not reflect presence and engagement, there were connections between feelings of narrative engagement, presence, perceived role, and pronoun use. All together, these results suggest that the language people use to describe their experiences with VR does reflect, at least in part, how connected they feel to the experience.

These findings parallel what we found by using validated self-reported measures: that participants' perceptions of their role in the film experience were related to narrative engagement and state empathy. In our experimental study, we did get a much clearer and more reliable picture of how subjects were seeing themselves in the narrative when we asked them directly who they thought they were, and had them complete validated self-reported questionnaires. But not all educators and game developers have time to have people fill out questionnaires about their experience or debrief people in detail about their experience. There isn't a one-to-one correspondence between the emotions and thoughts a viewer has in their VR experience and the language they use to retell the story, so we wouldn't advise using language as a diagnostic measure of one's VR experience. But this analysis suggests that educators and developers can consider the way people talk about their experiences with VR when judging how effective VR content is.

So how can we build on these initial findings? We still don't know if the small effect we found is consistent across different kinds of content, and we don't know very much about how language reflects long-lasting aspects of a person versus more immediate reactions to content. In the future we can examine these questions and better understand the relationship between VR experiences and language use by looking at how people retell stories of more and more varied VR narratives, or by looking at a different set of users, such as children.

References

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