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The Cognitive Representation of Fantasy Versus Pretense

Colleen McInnis

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Abstract

Do our minds process fantasy, pretense, and reality differently? Participants read fantastical (Snow White eating an apple), pretend (a girl pretending to be Snow White), or realistic (a girl eating an apple) vignettes. Participants' reaction to a property of each vignette's realistic context (apple as 'delicious') or its unrealistic context (apple as 'poisonous') was measured by a computer program. Differences in study 1 reaction time indicate that fantasy may require different mental representation than pretense and reality. Differences in study 2 fail to duplicate results from the fantasy condition in study 1, instead finding differences in mental representation after reading pretend vignettes. Trends in both study 1 and 2 indicate possible influences of fantasy and pretense on realistic thought.

The Cognitive Representation of Fantasy versus Pretense

Children start pretending as early as 18 months old, and their pretense develops throughout childhood. Lillard (2001) defines pretense as the elaboration and altering of one's present reality, including the people, objects, and scenarios. Pretending is also identified as an activity that is highly based in cognition; both psychologists and philosophers have presented theories as to how the pretense cognitive process may work (see Carruthers, 2006; Leslie, 19879; Lillard, 2001; Nichols & Stich, 2000). However, scientific research has focused on behavioral pretense, as well as reasons for pretending, and has not specifically identified a cognitive pretense process.

Leslie (1987) proposes a well-known and widely accepted theory of how pretense works in the mind. The basis for Leslie's theory is the idea that when pretending, we must be careful to not alter our understanding of reality. First, Leslie explains that a person has an individualized "representation"(i.e., a definition of, or idea about) all entities in reality. For example, when a person sees a banana, their "representation" or idea of banana becomes activated in their minds. The representation may include the fact that a banana is a fruit, it can be peeled, and that it can be eaten. Therefore, if a person were to pretend that a banana is a telephone, they must not alter their original representation of banana by thinking it is always a phone. The understanding of a banana as a telephone must only exist in the moment of the pretense, and it must stay there when the pretending ends. Leslie (1987) calls this "representational abuse" – the concern that pretense may permanently influence our understanding, or representations, of reality.

Leslie (1987) presents the concepts of "decoupling", "manipulating", and most importantly, "quarantining" to suggest how representational abuse is avoided in cognition. To start, in order to think of a banana as if it were a telephone, one recognizes that the original representation of banana is not sufficient and must be altered. Thus, a person must "decouple" their original idea of banana, or make a copy of ("duplicate"), their representation of banana. Then, instead of changing the original representation of banana to include qualities of a telephone, the new "copied" or "decoupled" representation of banana can be altered instead. This step is called "manipulating" – the altering of the new, secondary representation to fit the pretend scenario. Finally, in order to then focus on the new pretend representation as a banana, and to not alter that original representation of banana to include the new representation, one must not think about the old representation of a banana as a fruit. To avoid this, Leslie suggests that we need to "quarantine", or inhibit the original representation of a banana in our mind. One must not think about the banana as a fruit, or as something that can be peeled and eaten, so that idea is pushed to the back of the mind. Instead, a person can focus their mental efforts specifically on the idea that the banana is currently a communication device, a telephone.

Leslie (1987)'s concept of quarantining specifically suggests an important clue to how pretense might work in cognition. The idea of quarantining involves "inhibiting" an idea in our mind, and thus, most likely involves inhibitory control. Current research (Van Reet, McInnis, & Fast, 2012) is working to prove just this idea. Specifically, Van Reet et al.'s (2012) results show that children do in fact require inhibition of reality in order to consider pretend scenarios. However, results among adult participants

are less clear. Although adults seemed to initially show a tendency towards inhibiting reality during pretense, the trend is mostly non-existent.

What about fantasy?

Fantasy specifically includes the idea of "magic", which Nemeroff and Rozin (2000) loosely define as actions or beliefs that go against laws of nature, technology, or more generally, reality. Subbotsky, Hysted, and Jones (2010) stipulate that fantasy includes what is called "magical thinking" – an imaginary or "supernatural" world that includes alternatives or contradictions of reality. Examples of fantasy include witches, ghosts, or talking animals, along with more modern pop culture fantasy worlds such as Harry Potter or Twilight.

While the aforementioned definitions of fantasy are vague, fantastical thinking also appears to require the inhibition of reality – an important similarity to pretense. When a person reads Harry Potter, for example, they must temporarily suppress ideas and thoughts about modern communication – cell phones, email, etc. – in order to accept the "wizarding world's" use of methods such as owl mail delivery. As mentioned before, fantasy such as Harry Potter seems to almost require inhibition of the "natural laws" of reality – such as that humans can not fly, do magic, read minds, or become invisible (Nemeroff & Rozin, 2000; Subbotsky, Hysted, & Jones, 2010). Therefore, fantasy seems similar to pretense in its cognitive requirements. In fact, it appears as though it may be even more difficult, as it requires inhibition of more general, or simply a larger amount of aspects of reality.

After recognizing the similarity between pretense and fantasy, as well as understanding the differences, it is important for the purposes of this research to apply Leslie (1987)'s theory of cognitive pretense to an example of fantasy. A great example is a witch flying a broomstick. In order to think about this, a person must decouple their representation of "broomstick", and manipulate the new copied or decoupled representation of broomstick, so that the broom is now a flying device. Then, the person must quarantine their idea of using a broom to sweep the floor in order to focus the mind on the idea that a witch uses a broom to fly. It is possible that the application of this theory to fantasy may go farther than quarantining the representation of broomstick. A person may also have to quarantine the laws of gravity, the fact that witches do not exist, or the general fact that people can not fly. Remember at this point that the concept of quarantining involves inhibition, and most likely then, inhibitory control. Thus, by using this example of a witch flying a broomstick, it is easy to see how a person might need similar inhibitory control processes to pretense in order to think about fantasy.

Based off of Leslie (1987)'s theory, and its possible applications to fantastical thinking, the following research attempts to answer two questions. First, what might be the cognitive demands of fantasy thinking – does it truly require inhibition and quarantining? And second, is fantasy cognition different (i.e., more difficult) than or similar to pretense cognition?

In order to measure these differences, the current research used reaction time data. Reaction time is a reliable measure of how fast a person reacts to stimuli. In the case of the current research, reactions are measured in regards to how fast a participant reads a word out loud when they see the word appear on a computer screen. How fast the person says the word out loud can reliably tell a

researcher whether that word is currently "active" (i.e., present) in the mind. Specifically, Balota & Lorch (1986) used the idea of priming – exposing a person to one idea (lion) that would activate a second related idea, or word, in their mind (tiger), and asking them to respond to a the second idea – to provide reliable reaction time data. Balota & Lorch (1986) found that participants who were presented with the word 'tiger' were successfully primed to respond to the word 'stripes' more quickly, indicating that the word was 'active' in their minds. However, the word 'lion', which primed for the word 'tiger', did not influence participants to react more quickly to the word 'stripes'. Other research by Bunge, Dudukovic, Thomason, Vaidya and Gabrielli (2002) found that when asked to react to stimuli on a screen that were accompanied by distracting, inconsistent stimuli, participants displayed slower reaction times. The results from Bunge et al. (2002) suggest that when a person makes an effort to inhibit conflicting stimuli, response times to computer stimuli may be significantly delayed. Accordingly, Roelofs (2012) found that participants performing a basic "stroop task" who tried to read a color word (i.e., green) written in a conflicting color (i.e., red) had a significantly delayed response time to how quickly they could say the word. Based off of the aforementioned research, one could assume that a person who is quarantining or inhibiting an idea in their mind should be significantly slower to say that word than to say a word that is active or neutral, thus indicating inhibitory control. For example if a person is purposely making an effort not to think about a certain thing (i.e., eating a donut), they should be much slower to say that word (donut) than to say a word that they were currently thinking about (i.e., dog or leash), thus indicating inhibition of the idea of donut.

Study 1

Method

Participants

Thirty-four undergraduate participants were tested. Participants were between the ages of 18 and 22 (*M*= 19.88). All participants were recruited through the Psychology Department's volunteer participant website, SONA. All participants provided informed written consent, and were compensated with five dollars.

Materials and Procedure

Participants were instructed about the procedure verbally by the experimenter, as well as in written form on the computer screen. First, participants were asked to complete a test portion of the experiment by responding aloud to neutral words on the computer screen into the microphone. Participants were then exposed to a series of sentences on a computer screen. They were then asked to respond to a word out loud into a microphone (SV-1 Voice Key). Verbal response times to the words were measured in milliseconds by the computer program SuperLab.

The first five sentences that participants were exposed to were neutral test sentences to get the participants warmed up. The remainder of the sentences were created from a list of 25 fantastical characters (i.e., Harry Potter, Rapunzel, Snow White). For each fantastical character, three versions of a sentence were created. The three sentence types created were "fantasy", "pretend", and "realistic". In

accordance with each fantasy character's group of sentences there were two word types – a word relevant to either the fantasy version of the sentence or the realistic version of the sentence. There was no word type specifically associated with the pretend sentence types, because the pretend sentences were similar to the fantasy sentences in all aspects, except that they included a real person pretending to reenact the fantasy character's scenario.

An example of what participants experienced can be demonstrated with the example of Rapunzel as a fantasy character. For Rapunzel, a participant would see one of the following sentences: *fantasy version* – "Rapunzel lowers her very long hair out the window for the prince"; *pretend version* – "Katie pretends to lower her long hair out the window for a prince"; *realistic version* – "Katie braids her long hair before she goes to school in the morning." It is important to note that each sentence has an equivalent focus point – on Rapunzel (or Katie)'s hair. Thus, each participant should be focused on the idea of the hair in each sentence – either as something that can be climbed, or as something to be groomed. After seeing one of these sentences, a participant would then either see a word associated with the realistic version of the sentence, such as "brush", or with the fantastical version of the sentence, such as "rope".

Results

Study 1 results found, as predicted, that after reading the fantasy sentences participants were significantly faster to respond to the fantasy associates (M = 631.28) than to the real associates (M = 657.81), $t(32) = 2.85$, $p = .007$. There were no differences found in how quickly people reacted to fantasy or realistic associate words after either pretend (real M = 652.77; fantasy M = 644.77), $t(32) = 0.78$, $p = .4$, or real sentences (real M = 635.24; fantasy M = 648.89), $t(32) = 1.29$, $p = .2$ (See *Figure* 1). The results are unexpected specifically in relation to the realistic sentences. After reading the realistic sentences, it was expected that participants would be quicker to say a real associate word than a fantasy associate word. Not only were the realistic condition results insignificant, but also they trended in the opposite direction than expected, as indicated by the means.

It is possible that participants were engaged in the fantasy scenarios enough that they simply began to associate all words, including those after the realistic sentences, with fantasy more so than they might normally. Due to these unexpected results, the purpose of Study 2 is to determine whether the fantasy and perhaps even pretend sentences were influencing participants in their responses for realistic sentences. Study 2 also aims to duplicate results from the fantasy condition of Study 1.

Study 2

Method

Participants

Thirty-seven undergraduate participants were tested. Participants were between the ages of 18 and 22 (M = 20.19). All participants were recruited through the Psychology Department's volunteer participant website, SONA. All participants provided informed written consent. A majority of the

participants were compensated with five dollars; other participants received a small amount of class credit for their Introductory to Psychology classes.

Procedure

In order to replicate results from the fantasy condition, while distinguishing possible effects on the realistic condition, most of study 2 remained the same as study 1. Study 2 used the same sentences as study 1, with the addition of three new realistic condition sentences in order to get clearer results regarding the fantastical effects on reality. The main difference was the order in which the sentences were presented. Instead of allowing the sentences to be randomly chosen for type by the computer, study 2 controlled and ordered the sentences by type.

All participants began by seeing a block of 6 realistic versions of the sentences (identified as "Real 1"). This gave a pretest measure of how quickly participants responded to fantastical associates after being exposed only to reality. After the first realistic block of sentences, participants were either exposed to a block of 8 pretend sentences, or a block of 8 fantasy sentences. If they were exposed to the pretend sentences first, they would be exposed to the fantasy sentences after they had completed all the pretend sentences. Finally, all participants were exposed to a final block of 6 realistic sentences (identified as "Real 2"). The "Real 2 "condition served as a measure of how participants reacted to fantastical associates after being first exposed to fantasy/pretense, and then reality. After every sentence in all conditions, participants would again respond to either the realistic or fantastical associate word aloud into the microphone.

Participants were counterbalanced for order type and sentence type. Half the participants saw fantasy sentences first after "Real 1", and half the participants saw pretend sentences after "Real 1". Participants were never exposed to more than one version of a sentence for the same fantasy character. Thus, if they saw a realistic version of a sentence related to Snow White in the "Real 1" section, they would not be later exposed to a fantasy version of the Snow White sentence. In order to control for this, four versions of the experiment were created, each including a different group of sentences in each block of sentence types (i.e., Real 1, Fantasy, Pretend, and Real 2).

Results

Study 2 did not duplicate results from study 1. After exposure to fantasy sentences, participants were not significantly different in their response times to fantasy (M = 674.70) versus realistic (M = 677.38) associate words, $t(34) = 0.29$, $p = .77$. However, study 2 did find a significant difference within the pretend condition. After reading the pretend versions of the sentences, participants were significantly faster to the fantastical (M = 666.76) associate word than to the realistic (M = 685.78) associate word, $t(34) = 2.02$, $p = .05$. In regards to the realistic blocks of sentences, there was no significant difference, $t(34) = 0.59$, $p = .55$, in reaction time to fantasy (M = 675.119) versus realistic (M = 679.92) associate words during the first control block of realistic sentences (Real 1). During the second realistic group of sentences (Real 2), after exposure to fantasy and pretense, there was also no significant difference, $t(34) = 1.04$, $p = .31$, in response time to fantasy versus realistic associate words. However, this second realistic condition did trend in the predicted direction, as seen in study 1, with the

realistic associate words at a slower average time (*M* = 676.55) than the fantastical associate words average time (*M* = 660.19) (See *Figure 2*).

There were no significant order effects. Accordingly, there was no difference, $t(34)= 0.38$, $p = .71$, between the average reaction time to realistic words during the first block of real sentences versus the second block of realistic sentences. There was also no difference, $t(34)= 0.85$, $p = .4$, in the response times to fantastical words between the first and last blocks of realistic sentences. However, this also trended in the expected direction, with the average response time to fantastical associates faster after the second realistic block (*M* = 660.19) than after the first (*M* = 675.11).

Discussion

The results of the current research are unclear. There appears to be some sort of inhibitory control demands among both fantastical and pretend thought, as indicated by a significant effect of fantasy during study 1, and a significant effect of pretense during study 2. Due to the fact that the pretend sentences included a highly fantastical aspect, it is not entirely surprising that an effect was found in study 2. However, because the results are not replicated in the two studies, the effect appears unstable. When the effect of fantastical or pretend sentences on response time to fantastical versus realistic associate words is significantly different, it is assumed that inhibitory control is the mechanism responsible. The instability of the results indicates, however, that the need for inhibitory control is probably not as strong as originally thought.

There could be multiple explanations for these unstable results. For one, the participants in this study were exposed to the fantasy scenarios for only a few seconds, and were only involved in one sentence of each fantasy scenario. Perhaps it takes deeper involvement in fantasy scenarios, such as reading a paragraph or even a book, to require more intense inhibition or quarantining of reality. Thus, these sentences may have been brief enough that the participants were not truly submerged in a quarantined fantasy.

Second, these results appear consistent with Van Reet et al.'s (2012) research on pretense cognition. As mentioned in the introduction, adults in Van Reet et al.'s research are not consistent in showing a significant effect of quarantining, or inhibition, of reality after pretend scenarios. The sentences in Van Reet et al.'s research are similarly short, and participants are thus not involved deeply in the pretense scenarios before response time is measure. These results therefore support the current research.

It is interesting to note the differences between the pretend scenarios used in Van Reet et al.'s (2012) research, and the pretend scenarios used in the current research. Van Reet et al.'s scenarios involve very basic pretend scenarios, such as the example mentioned before of using a banana as a telephone. In comparison, the current research used scenarios in which a real person pretended to do something fantastical (i.e., flying on a broomstick), or pretended to be a fantastical character (i.e., Rapunzel). The scenarios used in the current research seem to require more difficult pretense, perhaps eliciting the significant results seen in the pretend condition of study 2. Again, the results are not easily replicated, but it is possible that future research may find differences between the cognitive demands of

different types of pretense, perhaps depending on their degree of difficulty or involvement of the participants.

Finally, it is possible that adults simply have such advanced cognition that both pretense and fantasy are not difficult tasks for them, requiring little to no inhibitory control or quarantining. Since results in both this research and Van Reet et al.'s (2012) found highly varying results regarding effects of fantasy and pretense in adult cognition, perhaps a different age group should be considered in future research. Young children may exhibit the inhibitory or 'quarantining' effects implied by Leslie (1987) and hypothesized by the current research. Subbotsky, Hysted, and Jones (2010) found that children who watched movie clips that contained magical aspects (i.e., Harry Potter) performed much higher on three measures of creativity. This influence of fantasy on children's creativity could mean that there are important and beneficial cognitive processes happening during children's fantastical thoughts, such as inhibitory control. Further, Van Reet et al.'s (2012) aforementioned research on pretending has found significant differences in how children ages four and five respond to reality after exposure to pretend scenarios, indicating in that the quarantining processes may be at work during children's basic pretense. Finally, the fact that children have a much higher tendency to believe in such fantastical creatures, like the tooth fairy or witches (Woolley, Boerger, & Markman, 2004), could make such research interesting and different than with adults who do not believe in such entities.

Although it was not significant, there also appears to be an influence of fantastical and/or pretend thinking on realistic thinking. Participants seemed slightly more inclined to associate fantastical words with reality situations after being exposed to fantasy or pretense beforehand. Perhaps support for this trend is noted by the aforementioned results of Subbotsky, Hysted, and Jones (2010), who found an influence of fantastical thinking on other creative tasks in children. Again, this implicates the need for future research to study children's fantastical thinking processes. Adults may simply be too advanced at these types of cognition to show the influences of fantasy on other thought processes, resulting in our insignificant trends in both study 1 and 2. Additionally, children have a natural tendency to separate pretend "worlds" or scenarios that are not obviously the same (Weisberg & Bloom, 2009). Perhaps this would effect how children process reality after exposure to fantasy situations, as they may be more inclined to put more effort into separating the two worlds.

In conclusion, despite the fact that this research is unclear it is a good starting point for fantasy cognition. Because little to no research has been done on the cognitive representations of both fantasy and pretense, there are multiple directions for future research to continue on the basis of this research. Not only do these results suggest interesting comparison points between fantasy, pretense, and reality, they also may add to previous research (Van Reet et al., 2012) on age differences among these types of cognition.

References

Balota, D. A., & Lorch, R. F. (1986). Depth of automatic spreading activation: Mediated priming effects in pronunciation but not in lexical decision. Journal of Experimental Psychology: Learning, Memory, Cognition, 12, 336-345.

Bunge, S. A., Dudukovic, N. M., Thomason, M. E., Valdya, C. J., & Gabrieli, J. D. E. (2002). Immature frontal lobe contributions to cognitive control in children: evidence from fMRI. *Neuron, 33.* 301-311.

Carruthers, P. (2006). Why Pretend? In S. Nichols, *The Architecture of the Imagination.* (pp. 89-109). New York: Oxford University Press Inc.

Leslie, A. M. (1987) Pretense and representation: The origins of 'theory of mind'. *Psychological Review, 94*, 412-426.

Lillard, A. (2001). Pretend play as twin earth: A social-cognitive analysis. *Developmental Review, 21*(4), 495-531.

Nemeroff, C. & Rozin, P. (2000). The makings of the magical mind. In Rosengren, K.S., Johnson, C.N., & Harris, P.L. (Eds.), *Imagining the Impossible: Magical, Scientific, and Religious Thinking in Children* (pp. 1-29). New York: Cambridge University Press.

Nichols, S., & Stich, S. (2000). A cognitive theory of pretense. *Cognition, 74*. 115-147.

Roelofs, A. (2012). Attention, spatial integration, and the tail of response time distributions in Stroop task performance. *The Quarterly Journal of Experimental Psychology, 65*(1), 135-150. doi: 10.1080/17470218.2011.605152

Subbotsky, E., Hysted, C., & Jones, N. (2010). Watching films with magical content facilitates creativity in

children. *Perceptual and Motor Skills, 111*(1), 261-277.

Van Reet, J., McInnis, C., & Fast, A. (2012, May). *Measuring the Representation of Pretend Object Substitutions.* Poster presented at the meeting of the Association for Psychological Science, Chicago, IL.

Weisberg, D.S., & Bloom, P. (2009). Young children separate multiple pretend worlds. *Developmental Science, 12*(5), 699-705. doi: 10.1111/j. 1467-7687.2009.00819.x

Figure 1.

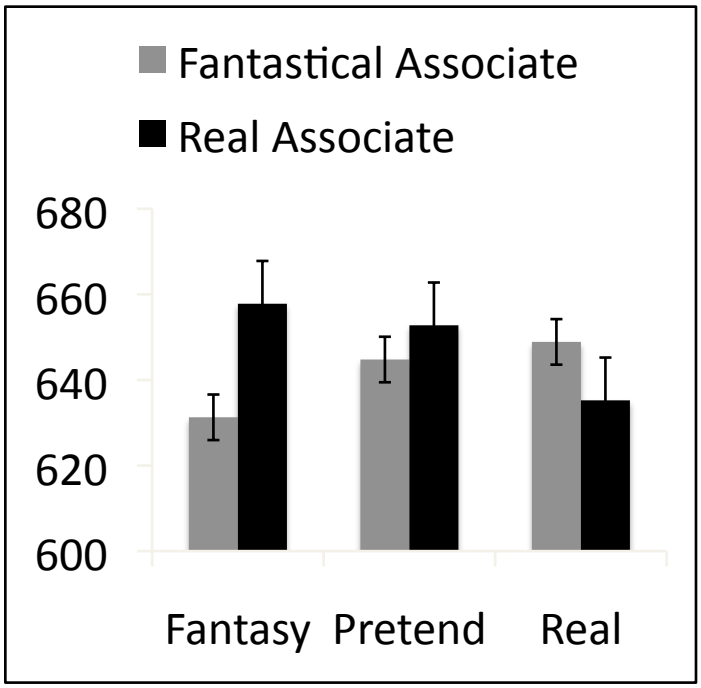

Figure 1. Means of reaction times from study one, reported in milliseconds, by sentence and word type.

Figure 2.

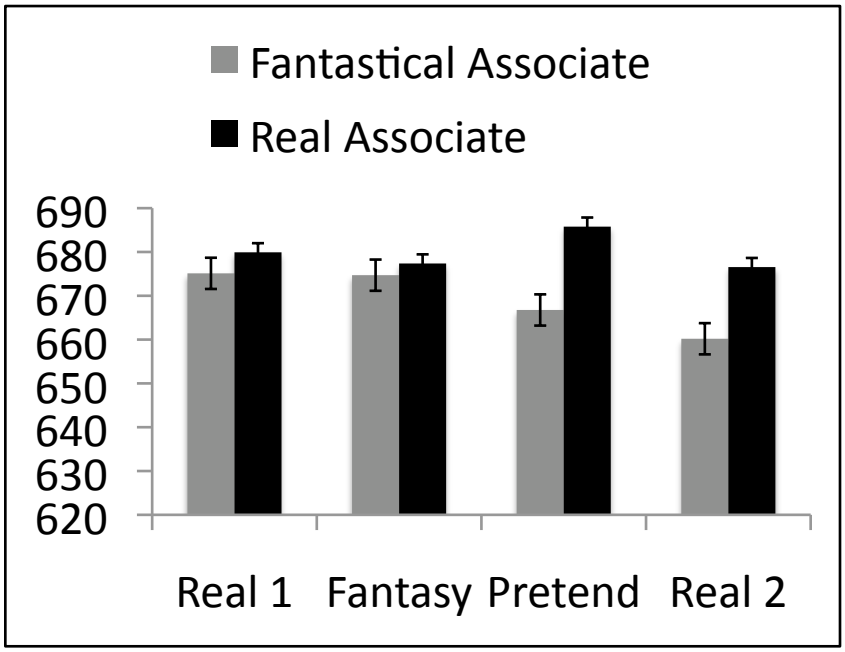

Figure 2. Means of reaction times from study two, reported in milliseconds, by sentence and word type.

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