Young children are not driven to explore imaginary worlds

Angela Nyhout[1] & Ruth Lee[2]

[1]University of Kent, Canterbury, CT2 7FS, UK, a.nyhout@kent.ac.uk
[2]Queen's University Belfast, University Road, Belfast, BT7 INN, UK, ruth.lee@qub.ac.uk

Abstract

We address Dubourg & Baumard's claim that imaginary worlds are most appealing early in the lifespan when the exploratory drive is highest. Preschool-age children prefer fictions set in the real world, and fantastical information can be difficult for children to represent in real time. We speculate that a drive to explore imaginary worlds may emerge after children acquire substantial real-world skills and knowledge. An account of age effects on fictional preferences should encompass developmental change.

Young children are not driven to explore imaginary worlds

A central claim by Dubourg and Baumard (D&B) is that imaginary worlds are most popular in childhood because learning via exploration is a primary function of this life stage. However, research suggests that preschool children do not prefer imaginary worlds that deviate from the real world over those situated in the real world, and that children and adults find some aspects of imaginary worlds difficult to represent. We argue that this is a problem for D&B's claim as currently presented. If imaginary worlds are popular primarily because they satisfy an adaptive preference for exploration, why does a drive to explore such worlds fail to manifest early in development?

Real-world exploratory behaviour is at its highest in early to middle childhood (Blanco & Sloutsky, 2021), and D&B seem to argue that imaginary world preferences should track with this real-world drive. To support their argument, D&B cite market evidence on the popularity of imaginary worlds in childhood and data from a study finding a negative correlation between age and imaginary world preferences (Dubourg, Thouzeau et al., 2021). However, market data provide limited insights given that parents strongly influence children's media consumption, and the cited correlational study included only adult participants (aged 18.5 to 32.7 years). If imaginary worlds serve as fertile ground for exploration in childhood, it is curious that developmental research indicates a lack of drive to engage with them in young children. Children's play, imagination, and future thinking all tend towards the realistic rather than the fantastical (Harris, 2021), and preschool children prefer realistic to fantastical fiction, both in their consumption (Barnes et al., 2015) and production (Weisberg et al., 2013) of stories. Harris (2021) suggests that preschoolers' reality bias amounts to a systematic assimilation of fantastical fictions to the real world, in contrast to the bottom-up world-building that D&B describe.

One possible reason for this might be that young children find certain aspects of imaginary worlds difficult to represent and process. Fictions present multiple types of novel information that consumers must integrate into a mental model that is continually updated as a narrative progresses (Zwaan & Radvansky, 2008), such as information about time, characters and their goals, fictional spaces and settings, and specific fictional rules and laws that apply within the world (e.g., causal principles, customs). During reading experiences, pre-adolescent children fail to monitor these factors in real time in the same way as adults (Bohn-Gettler et al., 2011). A particular problem for D&B's proposal arises when we consider spatial information. A central feature of their account is that exploring an imaginary world implies an ability to construct a mental map by representing and updating such information (p. 4), an ability they suggest is born of evolutionarily ancient wayfinding behaviour (p. 14). Both adults and children have difficulty constructing detailed spatial representations of new fictional worlds in narratives in the absence of visual input (Nyhout & O'Neill, 2017; Zwaan & Radvansky, 1998), and a comparison of 7-year-old children and adults suggests that children find this relatively more difficult than adults (Nyhout, 2015).

A further challenge is posed by the fact that much fictional information contradicts the consumer's knowledge of the real world. Adults are able to quickly integrate this kind of information into a mental model (Ferguson & Sanford, 2008 present vegetarian cats; Nieuwland & Van Berkum, 2006 introduce lovelorn peanuts). Whether this is the case for children is not yet clear, although preliminary evidence suggests that a difficulty in processing knowledge of a fantastical world arises for children during real-time sentence interpretation. After listening to brief stories in which fantastical protagonists were said

routinely to perform actions that contradicted participants' semantic and real-world knowledge (e.g., Wendy the witch has keys for her lunch; she doesn't have sandwiches for her lunch), and then hearing that (e.g.) "Wendy is eating…", 7-year-olds looked predictively to a picture of (e.g.) a sandwich, and adults to a picture of a key, at a rate above chance (Lee et al., 2017). That is, children tacitly predicted that an overtly fantastical story character would act in accordance with children's real-world knowledge, rather than with features of an imaginary world as explicitly described to them (Lee et al., 2017; Lee et al., in prep.).

A proposal that accounts for the complexity of narrative stimulus (i.e., the nature and degree of departure from the real world) in relation to developing cognitive abilities could help to explain children's preferences for reality-based fictions while still allowing for an exploratory drive to explain fictional preferences. If the function of the exploratory drive in childhood is to allow children to acquire new skills and information, there might be counterproductive outcomes for children of spending time in imaginary worlds when they still have much to learn about the real world. For this reason, we might expect imaginary worlds that have a substantial degree of overlap with the real world to appeal to young children. Indeed, young children are sensitive to the distinction between 'near' and 'far' (highly fantastical) fictional worlds, and use them in deciding what kind of information to "quarantine" rather than transfer to the real world (Richert & Smith, 2011; Walker et al., 2014). Only later in development, when children have acquired sufficient real-world skills and knowledge, might we expect a broader imaginary world preference to appear - perhaps as early as late childhood or adolescence.

Imaginary world preferences do not seem to be a straightforward function of a drive to explore the real world, at least for the brief fictional narratives that have been studied to date. Future work could investigate children's preferences when presented with other stimuli, such as movie-like scenarios that include complex visual scenes. Harris (2021) suggests that future research could also address the extent to which children's imagination is constrained by reality across the course of development. Here, an elaborated version of D&B's proposal - one that sets out to address developmental change, and addresses the matter of evolutionary advantage in that context - might be an interesting and useful starting point.

1) **Conflict of interest statement:** Conflicts of interest: none.
2) **Funding / financial support statement:** This research received no specific grant from any funding agency, commercial or not-for-profit sectors.

References

Barnes, J. L., Bernstein, E., & Bloom, P. (2015). Fact or fiction? Children's preferences for real versus make-believe stories. *Imagination, Cognition and Personality: Consciousness in Theory, Research, and Clinical Practice, 34*, 243–258. https://doi.org/10.1111/cdep.12128

Blanco, N. J., & Sloutsky, V. M. (2021). Systematic exploration and uncertainty dominate young children's choices. *Developmental Science, 24*(2).

Bohn-Gettler, C. M., Rapp, D. N., Van den Broek, P., Kendeou, P., & White, M. J. (2011). Adults' and children's monitoring of story events in the service of comprehension. *Memory & Cognition, 39*(6), 992-1011.

Dubourg, E., Thouzeau, V., de Dampierre, C., & Baumard, N. (2021). Exploratory preferences explain the cultural success of imaginary worlds in modern societies. *PsyArXiv*.

Ferguson, H. J., & Sanford, A. J. (2008). Anomalies in real and counterfactual worlds: An eye-movement investigation. *Journal of Memory and Language, 58*(3), 609-626.

Harris, P. L. (2021). Early constraints on the imagination: The realism of young children. *Child Development, 92*(2), 466-483.

Lee, R., Chambers, C.G., Huettig, F., & Ganea, P.A. [Unpublished manuscript]. Adults, but not children use fictional information to override stored semantic knowledge during anticipatory linguistic processing.

Lee, R., Chambers, C.G., Huettig, F., & Ganea, P.A. (2017). Children's semantic and world knowledge overrides fictional information during anticipatory language processing. In G. Gunzelmann, A. Howes, T. Tenbrink, & E. Davelaar (Eds.), *Proceedings of the 39th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.

Nieuwland, M. S., & Van Berkum, J. J. (2006). When peanuts fall in love: N400 evidence for the power of discourse. *Journal of Cognitive Neuroscience, 18*(7), 1098-1111.

Nyhout, A (2015). *Imagining story spaces: Young readers' ability to construct spatial representations of narrative.* [Doctoral Dissertation, University of Waterloo]. UW Space. https://uwspace.uwaterloo.ca/handle/10012/9442.

Nyhout, A., & O'Neill, D. K. (2017). Children's Enactment of Characters' Movements: A Novel Measure of Spatial Situation Model Representations and Indicator of Comprehension. *Mind, Brain, and Education, 11*(3), 112-120.

Richert, R. A., & Smith, E. I. (2011). Preschoolers' quarantining of fantasy stories. *Child Development, 82*(4), 1106-1119.

Walker, C. M., Gopnik, A., & Ganea, P. A. (2015). Learning to learn from stories: Children's developing sensitivity to the causal structure of fictional worlds. *Child Development*, *86*(1), 310-318.

Weisberg, D. S., Sobel, D. M., Goodstein, J., & Bloom, P. (2013). Young children are reality-prone when thinking about stories. *Journal of Cognition and Culture, 13,* 383– 407.

Zwaan, R. A., & Radvansky, G. A. (1998). Situation models in language comprehension and memory. *Psychological Bulletin, 123*(2), 162.