

For example, pretend play appears by 2 years (Harris & Kavanaugh, 1993), future thinking around 5 years (McCormack & Atance, 2011), counterfactual thinking between 3 and 6 years (Beck & Riggs, 2014), and creative problem solving between 5 and 8 years (Beck, Apperly, Chappell, Guthrie, & Cutting, 2011). There is very little research specifically on the development of thinking about imaginary worlds. The authors cite Taylor, Mottweiler, Aguiar, Naylor, & Levernier's (2020) study that surveyed 8- to 12-year-olds about whether they had "a special imaginary place that they think about a lot" as evidence that paracosms *can* be created by children. However, it was relatively uncommon for children to report creating imaginary worlds. Thus, only around 17% of 8- to 12-year-olds did so (compared, e.g., to around 50% reporting imaginary companions). Given that this is the age group where paracosms are thought to be most common, it seems that creating imaginary worlds is quite rare and emerges later than many other imaginative abilities.

D&B emphasise a broad range of imaginary worlds and their differences from reality: "far removed islands, locations in the future or the distant past, other planets, or environments in alternative history" (target article, sect. 2, para. 2). Because there is little developmental evidence showing that children create imaginary worlds, it is tempting to rely on the widespread view that children often engage with fantasy that is beyond what they experience in reality. Yet, when observing children's pretend play, we typically see them re-enacting mundane home or school scenes or pretending to enact a role they have personally experienced or seen on television. In fact, various lines of evidence indicate that much imaginative thinking is about the real world or its close cousins, rather than a distant or non-existent fantasy world (Harris, 2021). One rare study explored children's and adults' preferences for realistic or fantasy stories (both fictitious), for example, a realistic story "about a boy/girl with lots of brothers and sisters" and a fantasy story "about a boy/girl who lives on an invisible farm." Four- and five-year-olds showed no preference for either type of story over the other, and a preference for fantasy increased rather than decreased with age between children and adults (Barnes, Bernstein, & Bloom, 2015).

D&B underline the "uselessness" of information gained from imaginary worlds. But this contrasts with recent psychological accounts showing that using the imagination to think about reality can be particularly useful for children. For example, in a study of regret, 6- and 7-year-olds had to choose between two boxes. The box they picked contained fewer rewards than the unchosen box. Those children whose counterfactual thinking ("If I had picked the other box, I would have had the better prize") led to regret (feeling worse after the unchosen box's contents were revealed), were more likely to make rational decisions in the future, by choosing the alternative option (McCormack, Feeney, & Beck, 2020). In fact, we might even make the broader claim that thinking about imaginary worlds can increase our understanding of the real world. For example, when children read Harry Potter, they are learning about personal relationships and morality, as well as the rules of Quidditch.

D&B present evidence that preferences for consuming imaginary worlds decrease with age: books and films were studied by Purhonen, Gronow, and Rahkonen (2009) and Dubourg, Thouzeau, de Dampierre, and Baumard (2021), respectively. But the participants in these studies were adults, the youngest of whom were 18. This reflects a tendency in their account to group different ages together: "imaginary worlds should be

more attractive to children, teenagers, and young adults" (target article, sect. 5.2). But to make an effective developmental argument we need to be precise about the ages at which abilities emerge and how they interact. In particular, the developmental evidence on exploratory behaviour refers to children and (rarely) adolescents rather than adults, so it is currently difficult to marry this with the evidence on adults' fiction preferences.

Nevertheless, it is encouraging to see an account of the imagination that draws on diverse areas of evidence and we hope that developmental evidence can be used to ground this kind of account. The challenges we offer could be addressed by a more precise account of children's imagination abilities and how those abilities relate to their changing exploratory tendencies. Developmental psychology can also take lessons from this account, which highlights the lack of research on imaginary worlds and the key distinction between producing and consuming imaginary elements.

Funding. None.

Conflict of interest. None.

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*, 34, 243–258. <https://doi.org/10.1177/0276236614568632>.
- Beck, S. R., Apperly, I. A., Chappell, J., Guthrie, C., & Cutting, N. (2011). Making tools isn't child's play. *Cognition*, 119, 301–306. <https://doi.org/10.1016/j.cognition.2011.01.003>.
- Beck, S. R., & Riggs, K. J. (2014). Developing thoughts about what might have been. *Child Development Perspectives*, 8, 175–179. <https://doi.org/10.1111/cdep.12082>.
- Dubourg, E., Thouzeau, V., de Dampierre, C., & Baumard, N. (2021). Exploratory preferences explain the cultural success of imaginary worlds in modern societies. *PsyArXiv*, 1–19. <https://doi.org/10.31234/osf.io/d9uqs>.
- Harris, P. L. (2021). Early constraints on the imagination: The realism of young children. *Child Development*, 92, 466–483. <https://doi.org/10.1111/cdev.13487>.
- Harris, P. L., & Kavanaugh, R. D. (1993). Young children's understanding of pretense. *Monographs of the Society for Research in Child Development*, 58, i–107. <https://doi.org/10.2307/1166074>.
- McCormack, T., & Atance, C. M. (2011). Planning in young children: A review and synthesis. *Developmental Review*, 31, 1–31. <https://doi.org/10.1016/j.dr.2011.02.002>.
- McCormack, T., Feeney, A., & Beck, S. R. (2020). Regret and decision-making: A developmental perspective. *Current Directions in Psychological Science*, 29, 346–350. <https://doi.org/10.1177/0963721420917688>.
- Purhonen, S., Gronow, J., & Rahkonen, K. (2009). Social differentiation of musical and literary taste patterns in Finland. *Research on Finnish Society*, 2, 39–49. <https://doi.org/10.51815/fjsr.110689>.
- Taylor, M., Mottweiler, C. M., Aguiar, N. R., Naylor, E. R., & Levernier, J. G. (2020). Paracosms: The imaginary worlds of middle childhood. *Child Development*, 91(1), e164–e178. <https://doi.org/10.1111/cdev.13162>.

Autism and the preference for imaginary worlds

Heather Browning^a  and Walter Veit^b 

^aDepartment of Philosophy, Logic and Scientific Method, London School of Economics and Political Science, Centre for Philosophy of Natural and Social Science, London WC2A 2AE, UK and ^bThe University of Sydney, School of History and Philosophy of Science, Sydney, NSW 2006, Australia
DrHeatherBrowning@gmail.com; <https://www.heatherbrowning.net/>
wvweit@gmail.com; <https://walterveit.com/>

doi:10.1017/S0140525X21002211, e279

Abstract

Dubourg and Baumard mention a potential role for the human drive to systemise as a factor motivating interest in imaginary worlds. Given that hyperexpression of this trait has been linked with autism (Baron-Cohen, 2002, 2006), we think this raises interesting implications for how those on the autism spectrum may differ from the neurotypical population in their engagement with imaginary worlds.

Dubourg and Baumard (D&B) have developed an exciting integrative theoretical proposal for the evolutionary basis of our cultural fixation on imaginary worlds, based on our drive to explore and seek novel information about our environment. In passing, they mention another potential (complementary) explanation for the appeal of imaginary worlds, based on the cognitive mechanisms that drive us to a preference for systemisation, drawing on work by autism researcher Simon Baron-Cohen. Baron-Cohen (2002) argued that humans can be rated along the two dimensions of empathising and systemising, where systemising involves the drive to understand a system and how it operates. Autism, in his view, is associated with a lower score on the empathising dimension and a high score on the systemising dimension – they are “hyper-systemisers” (Baron-Cohen, 2006). More recent research conducted on a sample of over 600,000 individuals has supported this claim (Greenberg, Warrier, Allison, & Baron-Cohen, 2018).

This naturally leads to the thought that those with a higher systemisation drive would have a higher interest in the fictional worlds described; and in particular that those on the autism spectrum might show a strong interest. Although D&B do not speculate about how autism may relate to their hypothesis, we think there is something interesting here worth exploring, regarding how people on the autism spectrum might differ from the neurotypical population in their engagement with and preference for imaginary worlds. Anecdotally, there is something appealing to this line of enquiry. Both of the authors of this commentary are on the autism spectrum, and we both show a strong preference for fictions taking place within imaginary worlds, having spent far too much time on the works referred to by the authors (such as the Harry Potter series, the Marvel Cinematic Universe, One Piece, Naruto, Game of Thrones, Star Wars, and the like), having even written philosophical explorations of them (Browning & Veit, forthcoming).

A preference for “world-dominant” fiction, which focusses primarily on the details of the setting rather than the characters or narrative, is in fact commonly taken to be a trait associated with autism and matches well with this idea that autism relates to a higher systemising and lower empathising ability. Autism spectrum traits often include an “obsessive” focus with a subject matter – particularly the details of “closed systems” (Baron-Cohen, 2002); a trait that dovetails nicely with the “encyclopaedic impulse” described by D&B that fans of imaginary worlds regularly display. Imaginary fictional worlds provide a perfect closed system for one to investigate and systemise – unlike the real world, it is possible for one to gain a complete knowledge and understanding of all the facets of an imaginary world. Autism has often been associated with “geek” culture of the type that surrounds imaginary worlds. While this has not been well-explored in the academic literature, there are plenty of online discussion boards in which autistic individuals discuss the ways in which they feel their autism influences their preference for deep engagement with such imaginary worlds.

While all this theorizing on the links between a drive for systemising and engagement with fictional worlds remains speculative, it provides an interesting avenue for research both in terms of sex differences, as the authors suggest, and the effects of autism. The hypothesis provides testable predictions regarding the correlation of autistic traits and level of interest in world-dominant as opposed to story-dominant fictions. It would also be interesting to investigate the degree to which autism is related to creation of and engagement with “paratexts” such as online fanwikis that serve as a globally accessible resource for systemising all knowledge about the minute details of these worlds. Of course, we should expect differences to come in degree, rather than radical binary differences as autism, after all, is found on a spectrum and symptoms can differ.

Another potentially interesting question this could help answer is why individuals often seem to stick to a limited number of fictional worlds, exploring them in depth, rather than increasing novelty by expanding exploration more widely across the board. This is likely to be an instance of the exploration/exploitation trade off, where the latter of which can be divided into systemisation and successful information usage. After all, focus on one fictional story will inevitably consume time that could be spent on exploring others. If autism can be understood as hyper-systemisation, we may well have an excellent target system to study this side of the equation, with a hypothesis that more autistic individuals are more likely to stick to the details of a few fictional worlds, rather than engaging with a large number; a prediction consistent with the association of autism with a narrower range of interests (Baron-Cohen, 2006).

It is important to also note that research into autism is still in its infancy, and Baron-Cohen’s work (alongside other work of autism researchers) has been criticized for its focus on verbal report among those with so-called high-functioning autism. With autism increasingly recognized as a broad spectrum, non-verbal autistics may not be well represented in theories developed using only those in the “high-functioning” part of the spectrum (Chapman & Veit, 2020a, 2020b). This may be important, as for example, it has been found that preference for fiction over non-fiction in children with autism correlates with their communicative abilities (Davidson & Ellis Weismer, 2018). There is obviously still then a lot to understand about autism itself, before any speculation of this type can be strongly empirically grounded. Here, we simply wish to offer a new model/hypothesis for a subset of the phenomena linked with autism – that is, systemisation and interest in imaginative worlds – in a spirit of scientific pluralism without thereby implying that this rules out other explanations (Veit, 2019). Despite these caveats, we remain optimistic that an evolutionary lens on autism may offer exciting new pathways for future research.

Funding. WV’s research was supported under Australian Research Council’s Discovery Projects funding scheme (project number FL170100160).

Conflict of interest. None.

References

- Baron-Cohen, S. (2002). The extreme male brain theory of autism. *Trends in Cognitive Sciences*, 6(6), 248–254. [https://doi.org/10.1016/S1364-6613\(02\)01904-6](https://doi.org/10.1016/S1364-6613(02)01904-6).
- Baron-Cohen, S. (2006). The hyper-systemizing, assortative mating theory of autism. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 30(5), 865–872. <https://doi.org/10.1016/j.pnpbp.2006.01.010>.
- Browning, H., & Veit, W. (forthcoming). Why are we here? Evangelion and the desperate search for meaning in life. In: Cotton, C., & Winters, A. M. (Eds.), *Neon genesis Evangelion and philosophy*. Open Court.

- Chapman, R., & Veit, W. (2020a). The essence of autism: Fact or artefact? *Molecular Psychiatry*, 26, 1440–1441. <https://doi.org/10.1038/s41380-020-00959-1>.
- Chapman, R., & Veit, W. (2020b). Representing the autism spectrum. *The American Journal of Bioethics*, 20(4), 46–48. <https://doi.org/10.1080/15265161.2020.1730495>.
- Davidson, M. M., & Ellis Weismer, S. (2018). A preliminary investigation of parent-reported fiction versus non-fiction book preferences of school-age children with autism spectrum disorder. *Autism & Developmental Language Impairments*, 3, 1–12. <https://doi.org/10.1177/2396941518806109>.
- Greenberg, D. M., Warrier, V., Allison, C., & Baron-Cohen, S. (2018). Testing the empathizing–systemizing theory of sex differences and the extreme male brain theory of autism in half a million people. *Proceedings of the National Academy of Sciences*, 115(48), 12152–12157. <https://doi.org/10.1073/pnas.1811032115>.
- Veit, W. (2019). Model pluralism. *Philosophy of the Social Sciences*, 50(2), 91–114. <https://doi.org/10.1177/0048393119894897>.

Socioecology and fiction

Nicholas Buttrick^a  and Shigehiro Oishi^b

^aSchool of Public and International Affairs, Princeton University, Princeton, NJ 08540, USA and ^bDepartment of Psychology, University of Virginia, Charlottesville, VA 22904, USA
buttrick@princeton.edu; www.nickbuttrick.com
soishi@virginia.edu; <https://psychology.as.virginia.edu/oishi>

doi:10.1017/S0140525X21002223, e280

Abstract

We argue that the generation and enjoyment of imaginary worlds do not necessarily rely on an evolved preference for exploration. Rather, we suggest that culture is shaped by socioecological facts on the ground, and we hypothesize about the role of residential mobility, specifically, as an important factor in the popularity of imagined spaces.

While we find it plausible that consumption of imaginary worlds satisfies a desire for exploration, we are less convinced that the contemporary surge in the production of such worlds is the outgrowth of an evolutionary-psychological process that has finally been given the proper environment to express itself (target article, sect. 5.3). Instead of relying on such an ultimate-level evolutionary story, we suggest that the popularity of such narratives better tracks something far more proximate, changes in the socioecological environment in which such literature is produced and consumed.

Socioecological psychology seeks to understand human behavior with reference to the social and physical worlds in which people are embedded, investigating how factors such as the built environment, population density, demographic diversity, political system, and economic conditions shape and are shaped by individual and group psychologies (e.g., Choi & Oishi, 2020; Oishi, 2014). Residential mobility, specifically, may be especially relevant when thinking about the growth of imaginary worlds. As people move from place to place, they gain greater firsthand experience of the potential for difference in the world – different people, different environments, and different ways of being (see e.g., Buttrick & Oishi, 2021). This sense that a world can be other than it currently is would seem to be central to the production and consumption of a robustly imaginary space (e.g., Trilling, 1950).

Empirically, it may be useful to think about the historical context in which these imaginary worlds were and were not created. We can point, for example, to the contemporaneous experiences of Ming

China (1368–1664) and Western Europe. Ming China was at least as wealthy as England during the period of Shakespeare and Thomas Moore (Broadberry, Guan, & Li, 2018), and had a literary culture producing works as rich and renowned as *Journey to the West* and *The Plum in the Golden Vase*. So why was England at the forefront of the development of imaginary worlds, and not China?

One clear difference is that Ming China differed quite significantly from Europe in the degree to which it allowed its population to move. Thanks to the *baojia* system, most people were tied to their lands and the central government strongly discouraged voluntary residential mobility of any kind, extolling the importance of belonging to a place (Lary, 2012). By contrast, contemporary England was hypermobile – from the 1580s to the 1730s, it's estimated that nearly three-quarters of residents, men and women both, left the parish of their birth (Clark & Sounden, 1988). While England was more mobile than the rest of Western Europe during the seventeenth century (MacFarlane, 1991; Moch, 2009; Whyte, 2000), Western Europe had largely caught up by the eighteenth century (Hayhoe, 2016; see also Rosental, 1999). It may be no surprise then, that the list of imaginary worlds compiled by Wolf (2012) is so dominated, in the 1600s and 1700s, by French and English writers. As the everyday experiences of people involved changes in place, their appetites for cultural products echoed this variability of location.

Europe was not uniform in its patterns of mobility. Central Europe lagged a bit behind in its rate of residential mobility, and did not reach Western-European rates of mobility until the 1800s (Moch, 2009). One estimate has residential mobility rates in Germany roughly quadrupling from 1820 to 1880 (Hochstadt, 1999). This timeframe, for example, neatly matches the rise in popularity of the Brothers' Grimm's fairytales – an exemplar of alternate world-building. Initially published in 1812, they were relatively unpopular at first, with their popularity growing through the 1850s, eventually making it into the state curriculum of Prussia in the 1870s (Zipes, 2002), right at the nineteenth century peak of residential mobility; as Germany becomes more mobile, German writers appear with increasing frequency in Wolf's (2012) list.

Twentieth-century China also helps in thinking about the relationship between socioecology and the consumption of imaginary worlds, thanks to its severe swings in the official permissibility of changing one's residence. Residential mobility had a major peak in the 1920s and 1930s (Lary, 2012); with the rise of the Communist government came a return to a place-based system of citizenship, the *hukou*, which locked roughly 85% of the population in place, and by the 1980s, only 0.6% of this population were “not where they were supposed to be,” that is, had moved from where they had been tied (Chan, 2016). The liberalization of the 1980s encouraged ruralites to move: Scholars argue that China is now amongst the most mobile societies in the world, with as many as 200 million migrants (Fan, 2008). As the authors point out, science fiction first becomes popular in the late Qing and early-Republican era (mapping on to the first twentieth century wave of residential mobility), and again becomes popular at the turn of the twentieth century, right in the middle of the unprecedented boom in mobility set off by the end of the *hukou* system in the 1980s.

[We would also note that in their empirical paper (Dubourg, Thouzeau, de Dampierre, & Baumard, 2021), the authors find that the share of speculative novels, as a proportion of novels in general, peaks in the 1970s and dips thereafter. They may not realize it, but this is a trend that cleanly maps on to the pattern of American residential mobility in the twentieth century (Buttrick & Oishi, 2021), and not the linearly-increasing rise in American GDP (U.S. Bureau of Economic Analysis, 2021).]