

Literature and the Construction of the Mathematical Self: The Case of Picturebooks

Olga Fellus, University of Ottawa

“Literature transforms human experience and reflects it back to us, and in that reflection, we can see our own lives and experiences as part of the larger human experience. Reading, then, becomes a means of self-affirmation, and readers often seek their mirrors in books” (Bishop, 1990, p. ix).

“[W]ays of taking from books are as much a part of learned behavior as are ways of eating, sitting, playing games, and building houses” (Heath, 1982, p. 49).

Picturebooks, in their multiple forms, are universal, many would agree. Everybody has some experience reading a picturebook at a young age or to a young child as an activity of pleasure, curiosity, learning, and exploration. Given their prevalence and educational importance (e.g., Heath, 1982), researchers have been exploring the potential effect of picturebooks in learning mathematics. Within this context, picturebooks that focus on mathematics have been identified as powerful resources to teaching mathematical ideas such as numbers, patterns, shapes, estimation, measurement, sorting and classification, and quantitative relationships, to mention just a few. The value of using picturebooks in teaching mathematics has long been established (e.g., Whitin, 1992) and empirical research has provided some evidence to indicate a positive impact of using picture books on kindergartens’ mathematics achievement (e.g., van den Heuvel-Panhuizen et al., 2016).

Recently, a new trajectory of research embarked on the exploration of picturebooks through the lens of identity theory. Indeed, it was suggested that picturebooks are cultural artifacts that function as socializing mechanisms into traditional gendered roles (e.g., Hamilton et al., 2006), morals (e.g., Larsen et al., 2017), and history (e.g., Yi, 2021). Within mathematics education, Fellus et al. (2022) examined 24 picturebooks that tell stories about what it means to do mathematics. Fellus et al. (2022) employed a broad, four-dimensional identity framework to capture—simultaneously—auto/biographical identities (referencing personal mathematics-related experiences and their interpretation), discursal identities (referencing how people are talked to and about as doers and users of mathematics) authorial identity (referencing the opportunities learners take or receive to take ownership over mathematical ideas), and socioculturally available narratives about who can and who cannot do mathematics that are negotiated, aligned with or rejected) (Fellus, 2019).

Fellus et al. (2022) suggest that in order to disrupt the dichotomous misconception that mathematical ability is a gift, teachers can use picturebooks as an entry point to provide “opportunities for students to foster a mathematical authorial identity” (p. 7). To wit, picturebooks that tell stories about the experience of doing mathematics can be harnessed to foster, support, and sustain the development of authorial identity, i.e., the development of voice and ownership in mathematics. This can, in turn, democratize the doing and using of mathematics.

In this paper, I build on Fellus et al. (2022) to examine how picturebooks that tell stories about the experience of doing mathematics showcase authorial identity. Specifically, the following research questions are tackled: [1] Who are the protagonists across the picturebooks that tell the experiences of doing and using mathematics? [2] What opportunities of taking ownership over mathematical

ideas have they reportedly experienced? The analysis will focus on the 24 picturebooks that were reported on in Fellus et al. (2022). Further questions will be formulated based on findings about the development of authorial identity in mathematics.

References

- Bishop, R. S. (1990). Mirrors, windows, and sliding glass doors. *Perspectives: Choosing and Using Books for the Classroom*, 6(3), ix-xi.
- Fellus, O., Low, D. E., Guzmán, L. D., Kasman, A., Mason, R. T. (2022). Hidden figures, hidden messages: the construction of mathematical identities with children's picturebooks. *For the Learning of Mathematics*, 42(2).
- Fellus, O. O. (2019). Connecting the dots: Toward a networked framework to conceptualizing identity in mathematics education. *ZDM*, 51(3), 445-455.
- Hamilton, M. C., Anderson, D., Broaddus, M., & Young, K. (2006). Gender stereotyping and under-representation of female characters in 200 popular children's picture books: A twenty-first century update. *Sex Roles*, 55(11), 757-765.
- Heath, S. B. (1982). What no bedtime story means: Narrative skills at home and school. *Language in Society*, 11(1), 49-76.
- Larsen, N. E., Lee, K., & Ganea, P. A. (2018). Do storybooks with anthropomorphized animal characters promote prosocial behaviors in young children? *Developmental Science*, 21(3), e12590.
- Yi, J. (2021). Memoirs or Myths? Storying Asian American Adoption in Picturebooks. *Journal of Children's Literature*, 47(2), 22-34.
- van den Heuvel-Panhuizen, M., Elia, I., & Robitzsch, A. (2016). Effects of reading picture books on kindergartners' mathematics performance. *Educational Psychology*, 36(2), 323-346.
- Whitin, D. J. (1992). Explore mathematics through children's literature. *School Library Journal*, 38(8), 24- 28.