A (totally non-exhaustive) collection of papers, books, and book chapters that inspired my roundtable talk given at SABER West, 2021.

Evolution-Centered Teaching of Biological Sciences

Using the unifying framework for all biology to inform biology education practices.

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Cummins, C. L., Demastes, S. S., & Hafner, M. S. (1994). Evolution: Biological education's under-researched unifying theme. *Journal of Research in Science Teaching*, *31*(5), 445–448.

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Nehm, R. H., Poole, T. M., Lyford, M. E., Hoskins, S. G., Carruth, L., Ewers, B. E., & Colberg, P. J. (2009). Does the segregation of evolution in biology textbooks and introductory courses reinforce students' faulty mental models of biology and evolution? *Evolution: Education and Outreach*, *2*(3), 527.

Scott, E. C. (2010). Dobzhansky was right: Let's tell the students. *Bioessays*, *32*(5), 372–374.

Zook, D. (1995). Confronting the evolution education abyss. *Journal of Research in Science Teaching*, *32*(10), 1111–1120.

The Dual Causality of Biological Sciences

Proximate and ultimate causality is unique in biological sciences and requires understanding evolutionary principles.

Abrams, E., & Southerland, S. (2001). The how's and why's of biological change: How learners neglect physical mechanisms in their search for meaning. *International Journal of Science Education*, *23*(12), 1271–1281.

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Dewsbury, D. A. (1999). The proximate and the ultimate: Past, present, and future. *Behavioural Processes*, *46*(3), 189–199.

Mayr, E. (1961). Cause and effect in biology. *Science*, *134*(3489), 1501–1506.

Biology is booooring!

Away from the rote memorization of facts in early postsecondary biology courses.

Mervis, J. (2009). *Universities begin to rethink first-year biology courses.*

Momsen, J. L., Long, T. M., Wyse, S. A., & Ebert-May, D. (2010). Just the facts? Introductory undergraduate biology courses focus on low-level cognitive skills. *CBE — Life Sciences Education*, *9*(4), 435–440.

Student Explanations of Complex Biological Phenomena

How do students construct explanations about biology and where are they going wrong?

Chi, M. T., Roscoe, R. D., Slotta, J. D., Roy, M., & Chase, C. C. (2012). Misconceived causal explanations for emergent processes. *Cognitive Science*, *36*(1), 1–61.

Coley, J. D., & Tanner, K. (2015). Relations between intuitive biological thinking and biological misconceptions in biology majors and nonmajors. *CBELife Sciences Education*, *14*(1), ar8.

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Speth, E. B., Shaw, N., Momsen, J., Reinagel, A., Le, P., Taqieddin, R., & Long, T. (2014). Introductory biology students' conceptual models and explanations of the origin of variation. *CBE — Life Sciences Education*, *13*(3), 529–539.

Tinbergen Framework

Framework for analysis of behavioral adaptations and an application to education.

Nesse, R. M. (2013). Tinbergen's four questions, organized: A response to Bateson and Laland. *Trends in Ecology & Evolution*, *28*(12), 681–682.

O'Brien, D. T., & Gallup, A. C. (2011). Using Tinbergen's four questions (plus one) to facilitate evolution education for human-oriented disciplines. *Evolution: Education and Outreach*, *4*(1), 107.

Tinbergen, N. (1963). On aims and methods of ethology. *Zeitschrift Für Tierpsychologie*, *20*(4), 410–433.

Toward an Epistemology of Evolution

A smattering of topics: conceptual change theory, threshold concepts, the importance of narrative for understanding, and lessons from physics education research.

Bruner, J. S. (2009). *Actual minds, possible worlds*. Harvard University Press.

Carey, S. (1995). On the origin of causal understanding. In *Causal cognition: A multidisciplinary debate* (pp. 268–308).

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