

To appear in [PNAS](#) (available with subscription [here](#)), a critique of close analogies between biological and cultural evolution : "Repeated learning makes cultural evolution unique" by Pontus Strimling, Magnus Enquist, and Kimmo Eriksson from the [Centre for the Study of Cultural Evolution](#), Stockholm University

Abstract: Although genetic information is acquired only once, cultural information can be both abandoned and reacquired during an individual's lifetime. Therefore, cultural evolution will be determined not only by cultural traits' ability to spread but also by how good they are at sticking with an individual; however, the evolutionary consequences of this aspect of culture have not previously been explored. Here we show that repeated learning and multiple characteristics of cultural traits make cultural evolution unique, allowing dynamical phenomena we can recognize as specifically cultural, such as traits that both spread quickly and disappear quickly. Importantly, the analysis of our model also yields a theoretical objection to the popular suggestion that biological and cultural evolution can be understood in similar terms. We find that the possibility to predict long-term cultural evolution by some success index, analogous to biological fitness, depends on whether individuals have few or many opportunities to learn. If learning opportunities are few, we find that the existence of a success index may be logically impossible, rendering notions of "cultural fitness" meaningless. On the other hand, if individuals can learn many times, we find a success index that works, regardless of whether the transmission pattern is vertical, oblique, or horizontal.