L.A.S. and negative Schwarzian derivative do not imply G.A.S. in Clark's equation

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It has been conjectured for Clark's equation $x_{n+1} = \alpha x_n + (1-\alpha)h(x_{n-k})$ that a locally attracting fixed point is also globally attracting whenever h is a unimodal or decreasing map with negative Schwarzian derivative [1, 2, 3, 4]. In this talk we present some counterexamples to the conjecture when $k \geq 3$. One such counterexample is remarkably provided by Sheperd's function

$$h(x) = \frac{px}{1+x^q}$$

when the positive parameters p, q are appropriately chosen.

References

[1] H. A. El-Morshedy and E. Liz, *Convergence to equilibria in discrete population models,* J. Difference Equ. Appl. **11** (2005), 117–131.

[2] I. Győri and S. Trofimchuk, *Global attractivity and persistence in discrete population model,* J. Differ. Equations Appl. **6** (2000), 647–665.

[3] E. Liz, *Global stability and bifurcations in a delayed discrete population model,* Int. J. Qual. Theory Differ. Equ. Appl. **3** (2009), 66–80.

[4] C. Wang y J. Wei, *Bifurcation analysis on a discrete model of Nicholson's blowflies,* J. Difference Equ. Appl. **14** (2008), 737–746.