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**Re: Telomeres reveal silver spoon effects in a wild population**

To the Editor,

We would like to enquire about the suitability of the above manuscript for publication in *Evolution*. Our study addresses how the early-life environment experienced by individuals and populations can have delayed, late-life survival consequences. Such ‘silver spoon’ effects are very important, as they have clear implications for understanding ageing and life-history evolution in humans and wild organisms. Moreover, in natural populations, silver spoon effects have been shown to have important consequences for population growth rates and local extinction.

There is good evidence that silver spoon effects can occur in humans and wild organisms, but empirical studies have yielded mixed results. In 2009, a key paper showed that silver spoon effects can be sex-specific, and concluded that “Overall, our results emphasize the need to try to explain variation in the importance of early environment effects, both within and between taxa” (Sheldon & Wilkin 2009 *Curr. Biol.* **19**, 1998-2002). However, as of yet no studies have managed to do this.

We use an unparalleled long-term dataset of Seychelles warblers to show that telomere dynamics provide a much needed link between the early-environment and late-life survival. Telomeres shorten in response to oxidative damage that can occur due to environmental

stress, and there has been a substantial amount of recent research interest into the relationship between telomeres and survival (e.g. Heidinger *et al.* 2012; *PNAS*, **109**, 1743-1748), and the utility of telomere length as a biomarker of ‘hidden costs’ in wild populations (e.g. Asghar *et al.* 2015 *Science*, **347**, 436-438). In our study we found the striking result that reduced food availability and a poor social environment early in life shortens individuals’ telomeres, and that those individuals that suffer severe telomere shortening due to these poor conditions have reduced late life survival. Our results are novel in three respects:

- 1. Ours is the first study to demonstrate that reduced telomere length in early life is associated with reduced late life survival in a wild population.*
- 2. Ours is the first study to show telomere dynamics vary with temporally fluctuating environments.*
- 3. Ours is the first study to show that telomeres can reflect costs at the population – as well as individual – level. This suggests that telomeres may be a useful biomarker of population-health, and of potential use to a broad range of conservation and animal health practitioners.*

As it is highly multidisciplinary in its approach and focus, our manuscript will be of interest to a very broad range of scientists. We therefore hope you will agree that our study will be of interest to the broad readership of *Evolution*.

Yours Faithfully,

Lewis Spurgin (on behalf of the authors)