

REPLY TO KOMATSU ET AL.:

# From local social mindfulness to global sustainability efforts?

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Komatsu et al. (1) argue that Van Doesum et al. (2) may have overlooked the role of GDP in reporting a positive association between social mindfulness (SoMi) and the Environmental Performance Index (EPI) at country level. Although the relationship between EPI and SoMi is relatively weaker for countries with higher GDP, that does not imply that the overall observed relationship is a statistical artifact. Rather, it implies that GDP may be a moderator of the relationship between EPI and SoMi. The observed correlation is a valid result on average across countries, and the actual effect size would, at least to some degree, depend on GDP.

However, it would not be valid to select a subsample of countries with high GDP to test this, as such would create a restriction of range that artificially attenuates the correlation. The correct strategy is to test the degree to which GDP moderates the effect of EPI on SoMi. Unfortunately, the substantial collinearity between GDP and EPI (the Pearson correlation is 0.64 for raw GDP and 0.78 for log-transformed GDP) and the small sample size of countries prevent an effective test of the interaction term. If one still estimates the interaction, it turns out to be nonsignificant:  $\beta = -0.235$ ,  $t(26) = -1.041$ , and  $P = 0.308$  for raw GDP; and  $\beta = -0.045$ ,  $t(26) =$

$-0.343$ , and  $P = 0.734$  for log-transformed GDP. This result does not mean that, with a larger sample of countries, a statistically significant interaction would not be found, and, in any case, the average effect still remains valid. Moreover, the complexities of the world make it likely that alternative moderating variables will be discovered that relate to both EPI and SoMi; this makes future research even more important.

In that vein, it is encouraging to read that the EPI as updated in 2020 with some established drivers of climate change (e.g., waste management, CO<sub>2</sub> emissions from land cover change, and black carbon emissions) (3) still shows a positive association with SoMi as assessed in 2015 (1). Indeed, this may invite a shift from a relatively local to a more encompassing global focus. In many ways, people live their lives in the local environment, even though the outcomes may be experienced at the global level. Climate change is a strong case in point. While tentative, Komatsu et al. provide intriguing indications that SoMi can be associated with global sustainability, especially in their analysis of the ecological footprint of consumption—an interesting illustration that consumption is often local, while consequences are often global. We

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The authors declare no competing interest.

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thank the authors for their extension of our work, and we agree that the distinction between global and local sustainability efforts may be fruitful as a variable for future research

efforts. After all, this supports the idea that social mindfulness “may promote a social and political climate that helps recognize, address, and reduce climate change” (ref. 2, p. 6).

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- 1 H. Komatsu, J. Rappleye, I. Silova, Social mindfulness for global environmental sustainability? *Proc. Natl. Acad. Sci. U.S.A.*, 10.1073/pnas.2118710118 (2021).
- 2 N. J. Van Doesum et al., Social mindfulness and prosociality vary across the globe. *Proc. Natl. Acad. Sci. U.S.A.* **118**, e2023846118 (2021).
- 3 Environmental Performance Index, 2020 EPI results. <https://epi.yale.edu/epi-results/2020/component/epi>. Accessed 22 October 2021.