

## LETTER

REPLY TO KOMATSU ET AL.:

## From local social mindfulness to global sustainability efforts?

Niels J. Van Doesum<sup>a,b,1,2</sup>, Ryan O. Murphy<sup>c,d,2</sup>, Marcello Gallucci<sup>e,2</sup>, Efrat Aharonov-Majar<sup>f</sup>, Ursula Athenstaedt<sup>g</sup>, Wing Tung Au<sup>h</sup>, Liying Bai<sup>i</sup>, Robert Böhm<sup>j,k,l</sup>, Inna Bovina<sup>m</sup>, Nancy R. Buchan<sup>n</sup>, Xiao-Ping Chen<sup>o</sup>, Kitty B. Dumont<sup>p</sup>, Jan B. Engelmann<sup>q,r</sup>, Kimmo Eriksson<sup>s</sup>, Hyun Euh<sup>t</sup>, Susann Fiedler<sup>u</sup>, Justin Friesen<sup>v</sup>, Simon Gächter<sup>w</sup>, Camilo Garcia<sup>x</sup>, Roberto González<sup>y</sup>, Sylvie Graf<sup>z</sup>, Katarzyna Growiec<sup>aa</sup>, Serge Guimond<sup>bb</sup>, Martina Hřebíčková<sup>z</sup>, Elizabeth Immer-Bernold<sup>cc</sup>, Jeff Joireman<sup>dd</sup>, Gokhan Karagonlar<sup>ee</sup>, Kerry Kawakami<sup>ff</sup>, Toko Kiyonari<sup>gg</sup>, Yu Kou<sup>hh</sup>, Alexandros-Andreas Kyrtsis<sup>ii</sup>, Siugmin Lay<sup>jj</sup>, Geoffrey J. Leonardelli<sup>kk,ll</sup>, Norman P. Li<sup>mm</sup>, Yang Li<sup>nn</sup>, Boris Maciejovsky<sup>oo</sup>, Zoi Manesi<sup>pp</sup>, Ali Mashuri<sup>qq,rr</sup>, Aurelia Mok<sup>ss</sup>, Karin S. Moser<sup>tt,uu</sup>, Ladislav Moták<sup>vv</sup>, Adrian Neteđu<sup>ww</sup>, Michael J. Platow<sup>xx</sup>, Karolina Raczka-Winkler<sup>yy</sup>, Christopher P. Reinders Folmer<sup>zz,aaa</sup>, Cecilia Reyna<sup>bbb</sup>, Angelo Romano<sup>a</sup>, Shaul Shalvi<sup>q</sup>, Cláudia Simão<sup>ccc</sup>, Adam W. Stivers<sup>ddd</sup>, Pontus Strimling<sup>eee</sup>, Yannis Tsirbas<sup>ii</sup>, Sonja Utz<sup>fff,ggg</sup>, Leander van der Meij<sup>hhh</sup>, Sven Waldzus<sup>iii</sup>, Yiwen Wang<sup>jjj</sup>, Bernd Weber<sup>yy</sup>, Ori Weisel<sup>kkk</sup>, Tim Wildschut<sup>lll</sup>, Fabian Winter<sup>mmm</sup>, Junhui Wu<sup>nnn,ooo</sup>, Jose C. Yong<sup>ppp</sup>, and Paul A. M. Van Lange<sup>pp,2</sup>

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

Author contributions: M.G. analyzed data; N.J.V.D., R.O.M., M.G., and P.A.M.V.L. wrote the paper; and E.A.-M., U.A., W.T.A., L.B., R.B., I.B., N.R.B., X.-P.C., K.B.D., J.B.E., K.E., H.E., S.F., J.F., S. Gächter, C.G., R.G., S. Graf, K.G., S. Guimond, M.H., E.I.-B., J.J., G.K., K.K., T.K., Y.K., A.-A.K., S.L., G.J.L., N.P.L., Y.L., B.M., Z.M., A. Mashuri, A. Mok, K.S.M., L.M., A.N., M.J.P., K.R.-W., C.P.R.F., C.R., A.R., S.S., C.S., A.W.S., P.S., Y.T., S.U., L.v.d.M., S.W., Y.W., B.W., O.W., T.W., F.W., J.W., and J.C.Y. revised the paper.

The authors declare no competing interest.

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<sup>1</sup>To whom correspondence may be addressed. Email: n.j.van.doesum@fsw.leidenuniv.nl.

<sup>2</sup>N.J.V.D., R.O.M., M.G., and P.A.M.V.L. contributed equally to this work.

Published January 19, 2022.

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).

<sup>a</sup>Social, Economic and Organisational Psychology, Institute of Psychology, Leiden University 2300 RB Leiden, The Netherlands; <sup>b</sup>Knowledge Centre for Psychology and Economic Behaviour, Leiden University 2312 HS Leiden, The Netherlands; <sup>c</sup>Department of Economics, University of Zürich 8006 Zürich, Switzerland; <sup>d</sup>Morningstar Investment Management, Chicago, IL 60602; <sup>e</sup>Faculty of Psychology, University of Milano-Bicocca 20126 Milan, Italy; <sup>f</sup>Department of Psychology, Ben Gurion University of the Negev, Beer-Sheva 8410501, Israel; <sup>g</sup>Department of Social Psychology, Institute of Psychology, University of Graz 8010 Graz, Austria; <sup>h</sup>Department of Psychology, The Chinese University of Hong Kong, Shatin, NT, Hong Kong, China; <sup>i</sup>Department of Applied Psychology, School of Humanities and Social Sciences, Fuzhou University, Fuzhou 350108, China; <sup>j</sup>Department of Psychology, University of Copenhagen 1353 Copenhagen K, Denmark; <sup>k</sup>Department of Economics, University of Copenhagen 1353 Copenhagen K, Denmark; <sup>l</sup>Copenhagen Center for Social Data Science, University of Copenhagen 1353 Copenhagen K, Denmark; <sup>m</sup>Department of Clinical and Legal Psychology, Moscow State University of Psychology and Education, Moscow 127051, Russia; <sup>n</sup>Sonoco International Business Department, Darla Moore School of Business, University of South Carolina, Columbia, SC 29208; <sup>o</sup>Department of Management and Organization, Michael G. Foster School of Business, University of Washington, Seattle, WA 98195; <sup>p</sup>School of Social Sciences, Department of Psychology, University of South Africa 0003 Pretoria, South Africa; <sup>q</sup>Center for Research in Experimental Economics and Political Decision Making, Amsterdam School of Economics, University of Amsterdam 1001 NJ Amsterdam, The Netherlands; <sup>r</sup>Behavioral and Experimental Economics, The Tinbergen Institute 1082 MS Amsterdam, The Netherlands; <sup>s</sup>Center for Cultural Evolution, Stockholm University 114 18 Stockholm, Sweden; <sup>t</sup>Department of Psychology, University of Minnesota, Minneapolis, MN 55455; <sup>u</sup>Department of Strategy & Innovation, Institute of Cognition & Behavior, Vienna University of Economics and Business 1020 Vienna, Austria; <sup>v</sup>Department of Psychology, University of Winnipeg, Winnipeg, MB R3N 0G1, Canada; <sup>w</sup>Centre for Decision Research and Experimental Economics, School of Economics, University of Nottingham, Nottingham NG7 2RD, United Kingdom; <sup>x</sup>Laboratory of Social Interaction, Psychology Department, Universidad Veracruzana, Veracruz 91095, Mexico; <sup>y</sup>Escuela de Psicología, Pontificia Universidad Católica de Chile, Santiago 7820436, Chile; <sup>z</sup>Department of Personality and Social Psychology, Institute of Psychology, Czech Academy of Sciences 602 00 Brno, The Czech Republic; <sup>aa</sup>Department of Social and Personality Psychology, Institute of Psychology, SWPS University of Social Sciences and Humanities 03-815 Warsaw, Poland; <sup>ab</sup>Laboratoire de Psychologie Sociale et Cognitive, Université Clermont Auvergne (CNRS, LAPSCO), Clermont-Ferrand F-63000, France; <sup>ac</sup>Sherpany Product Department, Agilentia AG 8001 Zürich, Switzerland; <sup>ad</sup>Department of Marketing and International Business, Carson College of Business, Washington State University, Pullman, WA 99164-4730; <sup>ae</sup>Department of Business, School of Business, Dokuz Eylül University 35390 Izmir, Turkey; <sup>af</sup>Department of Psychology, York University, Toronto, ON M3J 1P3, Canada; <sup>ag</sup>School of Social Informatics, Aoyama Gakuin University, Kanagawa 252-5258, Japan; <sup>ah</sup>Institute of Developmental Psychology, Beijing Normal University 100875 Beijing, China; <sup>ai</sup>Department of Political Science and Public Administration, National and Kapodistrian University of Athens 10678 Athens, Greece; <sup>aj</sup>Centro de Medición Mide UC, Escuela de Psicología, Pontificia Universidad Católica de Chile 7820436 Santiago, Chile; <sup>ak</sup>Rotman School of Management, University of Toronto, Toronto, ON M5S 3E6, Canada; <sup>al</sup>Department of Psychology, University of Toronto, Toronto, ON M5S 3E6, Canada; <sup>am</sup>School of Social Sciences, Singapore Management University, Singapore 178903; <sup>an</sup>Graduate School of Informatics, Nagoya University, Nagoya 4648610, Japan; <sup>ao</sup>School of Business, University of California, Riverside, CA 92521; <sup>ap</sup>Department of Experimental and Applied Psychology, Institute for Brain and Behavior Amsterdam, Vrije Universiteit Amsterdam 1018 HV Amsterdam, The Netherlands; <sup>aq</sup>Department of Psychology, University of Brawijaya, Malang 65145, Indonesia; <sup>ar</sup>Department of Social Sciences, University of Brawijaya, Malang 65145, Indonesia; <sup>as</sup>Department of Management, City University of Hong Kong, Kowloon, Hong Kong, China; <sup>at</sup>Business School, London South Bank University, London SE1 0AA, United Kingdom; <sup>au</sup>School of Psychology, University of Queensland, Brisbane, QLD 4072, Australia; <sup>av</sup>Centre de Recherche en Psychologie de la Cognition, du Langage et de l'Emotion, Maison de la Recherche, Aix-Marseille Université 13100 Aix-en-Provence, France; <sup>aw</sup>Department of Sociology and Social Work, Alexandru Ioan Cuza University of Iasi 700460 Iasi, Romania; <sup>ax</sup>Research School of Psychology, The Australian National University, Canberra, ACT 2601, Australia; <sup>ay</sup>Institute of Experimental Epileptology and Cognition Research, University of Bonn 53127 Bonn, Germany; <sup>az</sup>Department of Developmental, Personality and Social Psychology, Faculty of Psychology and Educational Sciences, Ghent University 9000 Ghent, Belgium; <sup>baa</sup>Center for Law and Behavior, Department of Jurisprudence, Amsterdam Law School, University of Amsterdam, 1001 NA Amsterdam, The Netherlands; <sup>bab</sup>Instituto de Investigaciones Psicológicas, Consejo Nacional de Investigaciones Científicas y Técnicas, Universidad Nacional de Córdoba 5000 Córdoba, Argentina; <sup>bac</sup>Católica-Lisbon School of Business and Economics, Universidade Católica Portuguesa 1649-023 Lisbon, Portugal; <sup>bad</sup>Psychology Department, Gonzaga University, Spokane, WA 99258; <sup>bae</sup>The Institute for Futures Studies, Stockholm 111 36, Sweden; <sup>baf</sup>Social Media Lab, Leibniz-Institut für Wissensmedien 72076 Tübingen, Germany; <sup>bag</sup>Department of Psychology, University of Tübingen 72074 Tübingen, Germany; <sup>bah</sup>Department of Industrial Engineering, Eindhoven University of Technology, 5600 MB Eindhoven, The Netherlands; <sup>bai</sup>Centro de Investigação e Intervenção Social, Instituto Universitário de Lisboa, Lisboa 1649-026, Portugal; <sup>baa</sup>Institute of Psychological and Cognitive Sciences, Fuzhou University, Fuzhou 350108, China; <sup>baa</sup>Coller School of Management, Tel Aviv University, Tel Aviv, Israel 6997801; <sup>baa</sup>Center for Research on Self and Identity, School of Psychology, University of Southampton, Southampton SO17 1BJ, United Kingdom; <sup>baa</sup>Mechanisms of Normative Change, Max Planck Institute for Research on Collective Goods 53115 Bonn, Germany; <sup>baa</sup>Key Laboratory of Behavioral Science, Institute of Psychology, Chinese Academy of Sciences 100101 Beijing, China; <sup>baa</sup>Department of Psychology, University of Chinese Academy of Sciences 100049 Beijing, China; and <sup>baa</sup>School of Social Sciences, Nanyang Technological University, Singapore 639798

- 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.