

Intragenerational inequality and intergenerational sustainability

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1. Introduction **

Some literatures implies that there are some mechanisms and institutions to positively influence people for IS (Intergenerational sustainability) and that inequality adversely affects intragenerational cooperation (Markussen et al. 2021). However, little is known about how people behave for IS under the presence (or absence) of inequality. We pose an open question “how does inequality in a generation, i.e., intragenerational inequality, affect the people’s behaviors to future generations for IS?” hypothesizing that people tend to behave selfishly and IS is compromised under the inequality as compared to the equality.

2. Experiment setting

To reveal the effect of inequality for IS, we set up an online intergenerational goods game (IGG) experiment is conducted with 340 subjects under three treatments that correspond to the equality (Equality), high inequality (HI) and super-high inequality (SHI) in a generation, respectively. In IGG, each subject in a generation of five members decides how much she harvests for herself from an intergenerational common good, given some endowment, and the endowments to the members are experimentally parameterized to mimic equality and inequality in a generation as the treatments. If the members (do not) in the current generation harvest too much, the common good shall be (replenished) depleted and (be transferred) not be transferred to the next generation. If the common good is depleted and not transferred, people in the next generation will suffer and their payoffs shall be low (Hauser et al., 2014).

3. Results and discussion

Figure 1 presents the boxplots of the individual harvests across the treatments, suggesting that the median the individual harvests under Equality treatment (10 points) is lower than those under HI and SHI treatment (15 and 15 points, respectively). Figure 2 displays the distributions of the individual harvests by percentages under Equality, HI and SHI treatments, demonstrating that the percentage of subjects who harvest 20 points (equivalently, Indh20) under Equality treatment (approximately 25%) is low compared to those under HI and SHI treatments (40% and approximately 39%). On the other hand, the percentages of subjects who harvest 10 points (equivalently, Indh10) under Equality treatment (35%) are high as compared to those under HI and SHI treatments (23% and 18%, respectively). The results confirm that the distribution under

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Equality treatment is different from those under HI and SHI treatments, being similar with respect to medians and modes. Specifically, the 1st and 2nd modes under equality (the inequalities) are 10 (20) and 20 (10), demonstrating that the distributional differences in the individual harvests between Equality and HI treatments as well as Equality and SHI treatments with a null hypotheses, meaning that the distributions between Equality and HI (Equality and SHI) treatments are statistically different at 5% (10%) level.

Our results indicate that intragenerational inequality induces the members to harvest more, adversely affecting IS. Although the members with high endowments tend to reduce their harvests as compared to those with low endowments under inequality or to those under equality,

the reduction is not enough to maintain IS. Overall, this study suggests that intragenerational inequality and IS shall be in a trade-off relationship. Thus, optimally finding a moderate path between the two will be a practical resolution, as capitalism is so dominant that intragenerational inequality is widening in the world.

<References>

Hauser, O., Rand, D., Peysakhovich, A., and Nowak, M. (2014). Cooperating with the future. *Nature*, 511:220–223.

Markussen, T., Sharma, S., Singhal, S., and Tarp, F. (2021). Inequality, institutions and cooperation. *European economic review*, 138:103842.

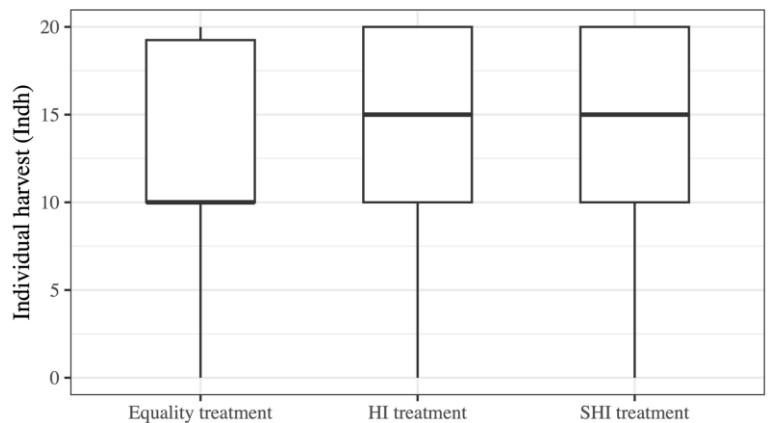


Fig.1 Box plots of the individual harvest (Indh) under Equality, HI and SHI treatments

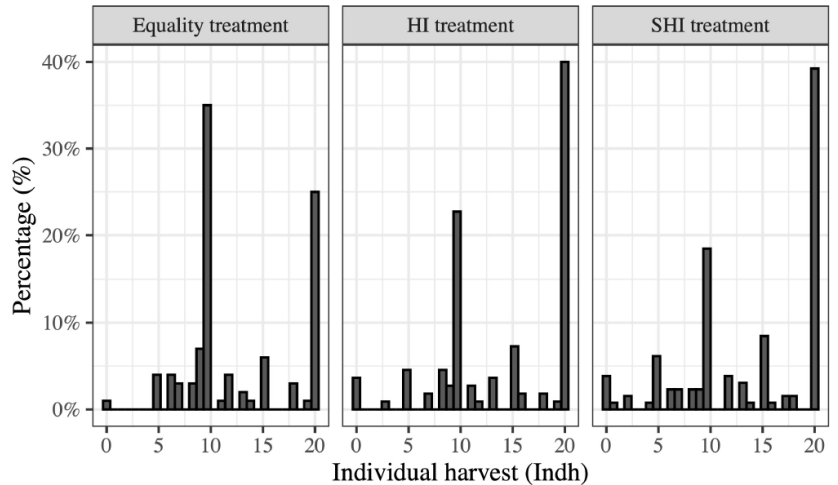


Fig.2 Frequency distribution of the percentages of the individual harvest (Indh) per subject under Equality, HI and SHI treatments