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The Problem of Optimal Population Size

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By “optimal population size” one usually means the population size that maximizes value given certain constraints on available resources (see e.g., (Dasgupta 1969)). According to classical optimum population theory, the relevant value is taken to be economic output (Dasgupta 1969). In contrast, today, most consider the relevant value to be human wellbeing. When policies affect populations of fixed size, maximizing value is a fairly straightforward optimization task. However, when policies affect future generations, the affected population isn’t fixed, since the policies will affect not only the living conditions of future people but also how many people will exist.

If the current generation continues to consume resources at the expense of future generations, and the population increases significantly, this could lead to an enormous population—ten billion people per generation—in which most people’s lives are barely worth living. Suppose we could instead create a smaller population—around one billion people per generation—with very good lives. Which population would be better? Most would probably say the latter; that is, they would say that a smaller population with a high quality of life is better than a much larger population with a much lower quality of life. However, many traditional moral theories yield the opposite result. Classical Utilitarianism (CU) (see §4.3.5), is one example. According to CU we should maximise overall welfare. There are two quite different ways in which we could do this: by making people’s lives better, or by increasing the size of the population with lives worth living. So, according to CU, an enormous population with lives barely worth living *could* be better than a smaller population with very good lives. In his seminal work on optimal population size, Derek Parfit (1984, 388) named this result “the Repugnant Conclusion” and considered it a reason to reject CU.

The Repugnant Conclusion highlights a problem in a field known as *population ethics*; the problem is finding an adequate theory of population value where the number of people, their welfare, and their identities may vary.

One might think that Average Utilitarianism (AU), which ranks populations according to the average welfare per life in the population, fares better than CU, since it avoids the Repugnant Conclusion. However, AU implies that we can improve a population by adding lives not worth living (Parfit 1984, p. 422, Arrhenius 2000).

The suggestions regarding how to avoid the Repugnant Conclusion are diverse. They include: introducing new ways of aggregating welfare into a measure of value; questioning the way we compare and measure welfare; counting welfare differently depending on temporal features or modal ones; revising the notion of a life worth living; giving up transitivity of "better than"; and appealing to other values such as, for example, equality and desert (for an overview and references, see Arrhenius et al. 2014, Broome 2004, Blackorby et al. 2005, Arrhenius forthcoming). Although these theories often succeed in avoiding the Repugnant Conclusion, they have other counterintuitive consequences. In fact, several impossibility theorems demonstrate that no theory can fulfil a number of intuitively compelling adequacy conditions which, most agree, any reasonable theory of optimal population size must fulfil (see e.g., Arrhenius forthcoming, 2000, 2011)—for example, the condition that one population is better than another if everyone is better off in the former than the latter, and the condition that it is better to create people with a higher rather than a lower level of well-being.

Though Parfit never found an acceptable theory of optimal population size, he continued to hope that such a theory would be found (Parfit 1984, p. 451) Others are more pessimistic in light of the impossibility theorems in the field. Such theorems seem to leave us with only three options: (1) Abandon one of the adequacy conditions on which the theorem is based; (2) become moral skeptics; or (3) explain away the significance of the impossibility theorems. There is no easy choice here.

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