

FRUGALITY: PSYCHOLOGY'S ULTIMATE CHALLENGE TO PREVENT REBOUND EFFECTS

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The preferred political strategy in many industrialized societies these days is apparently the promotion and distribution of progressively more efficient technologies. The strategy seems to indeed stall the overall energy consumption of modern economies at existing rates. In my presentation, I argue that efficient technologies seem to work with industry and commerce because cheaper production--due to more efficient technologies--results in competitive advantages in the market economy.

The promotion and distribution of efficient technologies, however, fails to reduce the overall energy consumption of economies to markedly lower levels. Even worse, on the level of individual households and individuals, efficient technologies apparently spark energy consumption rather than cut it (Kaiser & Vllasaliu, 2011). The explanation for the increase is fairly simple: Technology is an amplifier of people's actions, which in turn help people to attain personal goals, such as handling complexity, retrieving certain information, or traveling to a particular place. Computers, for instance, considerably enhance the effectiveness of handling complex tasks and of retrieving information. Cars and airplanes, as other examples, allow people to travel more efficiently to more and more remote places (Midden, Kaiser, & McCalley, 2007).

The use of technology unavoidably requires the consumption of energy and natural resources, either in the original production of the technology or in its everyday utilization. Thus, when behavior is augmented with technology, human behavior becomes more effective but also more consumptive. Better engineering and redesigning have improved the efficiency of many of our cherished technological appliances. Despite remarkable improvements in terms of efficiency, per capita energy consumption has never shrunk in the past and continues to grow. This rise in per capita energy consumption is a result of what is referred to as direct rebound effects (e.g., Hertwich, 2005).

Rebound effects can be described as the offset part of a successful implementation of a more efficient technology, which compensates for some of its energy gains or even negates them entirely by stimulating additional unanticipated consumption and/or use of the technology (cf. Jevons, 1865). Instead of claiming, figuratively speaking, the financial or temporal profits, augmented technology typically boosts consumption. For example, despite a more effective transportation technology over the years, time spent in daily commutes seems a constant. Necessarily, the distance between home and work environments has expanded. Apparently, potential time savings are not perceived as freed assets that could be spent otherwise. Similar to such time-related rebound effects, there are also money-related ones. For instance, this is the case when economic gains--due to reduced energy prices--are reinvested in the same appliances or activities: for example, bigger cars and more mobility.

The psychologically interesting question is why rebound almost unavoidably occurs with more efficient technology. So far, there seems no plausible psychological account for this surprising phenomenon. I believe the answer lies in the personal goals that trigger behavior and, thus, the use of technology in the first place. In this explanation, rebound effects are the result of the same, still unattained personal goals that originally motivated a particular action. For example, a lack of green space may make somebody leave the city center and move to the suburbs. By doing so, he or she simultaneously ex-

pands his or her commuting distance. As long as the original reason for the relocation (i.e., enough green space) remains insufficiently attained, commute-related freed assets, such as time and money, will be reinvested in the same activity, namely, relocation to ever greener grasses in combination with ever longer commuting distances.

Moreover, a heterogeneous and presumably infinite number of personal goals are constantly ready to take advantage of a technology's efficiency gains in terms of freed time and/or money. As long as saving energy and using less (i.e., frugality) are not of personal significance for users, the purchase and the use of any technology--efficient or not--are dominated by the technology's personal utility (i.e., its benefits and gains). Technology's utility for personal goals is, as I believe, the driving force behind the notorious rebound effect. By contrast, only if frugality (i.e., abstention from use) and selflessness (i.e., abstention from personal gains) become important personal goals, rebound is avoidable.

People highly engaged in environmental protection have indeed been found to be generally more frugal and more selfless (e.g., Kaiser & Byrka, 2011). In other words, selflessness and frugality seem to be the key forces behind people's environmental engagement (e.g., Bamberg & Möser, 2007; Stern, 2000). This is not a great surprise, as the opposite--environmental deterioration--is recognized as the consequence of self-interest and personal utility considerations undermining people's environmental protection--abstention from use (i.e., frugality) and abstention from personal gains (i.e., selflessness)--in the collective interest (Hardin, 1968).

Logically, I expect efficient technology to work only with frugal people. In other words, only the more environmentally engaged, the persons with a comparatively pronounced frugality, will use efficient technology in a way that does not result in rebound effects, that reduces rather than sparks energy consumption. To my knowledge, this frugality-technology-interaction hypothesis has not been tested so far.

Unfortunately, people's frugality and selflessness is most likely difficult--if not impossible--to promote by means of moral exhortation or instructions. One argument comes from Garrett Hardin (1968). He considers moral exhortations, for example, to be unfair because only the "good"--the virtuous people--will voluntarily respond. As an even worse consequence, moral exhortation will eventually eliminate the genetic basis for the very trait that makes people act selflessly in the first place. Another objection against moral reasons and exhortations refers to the lack of absolutes. Without moral absolutes though, any moral reasoning and any moral principle must draw dissent and create conflict, which renders moral-based campaigns in secular societies more or less impracticable.

A person's appreciation for nature, by contrast, might be a promising alternative leveraging point for promoting selflessness and frugality in people (Roczen, Kaiser, & Bogner, 2010; for more details on the concept, see e.g., Kaiser, Hartig, Brügger, & Duvier, in press). By endowing people with enjoyable and gratifying experiences in nature and thereby with rewards such as escapes from daily demands, replenishment of mental resources, and recovery from stress, people come to appreciate nature. Widely and extensively stimulating gratifying and joyful learning experiences in nature through schools and through health services could be the logical measure to promote environmental engagement and, thus, selflessness and frugality to an extent that helps to eventually prevent rebound effects and to make efficient technologies work.

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