

# 8.

## SUSTAINABLE DEVELOPMENT AS POST-MODERN CULTURE

by Pentti Malaska

### 8.1 Modernity and progress

Sustainable development is introduced in this paper as the kernel of a post-modern civilization, its intrinsic idea of progress.<sup>1</sup> It has been said that no other concept has been so important to the societies in the western world as the idea of progress: a belief in the continuous improvement of incomplete humankind.

The idea of a humankind progressing through time was articulated already in antiquity, but the modern idea of progress, the modern project, was set in motion in the Enlightenment period some four hundred years ago, and since then the western world has been accomplishing this project with some great success but with failures also. When humankind is said to progress, it is regarded as changing or developing for better in its material and social well-being, as well as morally, and in its relationship with nature. The concept of progress is thus not only a factual concept like the concepts of change, growth, development or evolution but is intrinsically a value concept.

The essence of modernity and its peculiar idea of progress meant two things: firstly, an emancipation of human knowledge from the authority of the holy scriptures or magic and, secondly, an emancipation of people as autonomous moral actors from the external or divine authorities.

According to the western myth of progress, people will prosper,

#### **Progress by Growth**

*It is not surprising that growth continues,  
even though the Earth is finite.*

*Most people, rich or poor,  
see expansion and growing more  
as the only imaginable solution  
to their real and immediate problems  
even though the Earth is finite.*

*In the world of riches, growing more  
appears to be the way of life  
necessary for employment, status,  
paying back anticipated growth some day,  
and for development defined solely by things  
and matter  
even though the Earth is finite.*

*In the world of poor, growing more  
seems the only way out of poverty and despair, and  
having children not only as a source of joy and love,  
but as a thing of trade and safety of life  
even though the Earth is finite.*

*Until other ways but growing more  
are found to remedy the problems encountered,  
the people will not give up their hopes and desires  
invested in the idea of progress by growth  
even though the Earth is finite.*

*But the Earth is finite!*

*(Pentti Malaska)*

feel better and value their lives more, when they are free to apply their own will, sense and reason rather than having to obey external authorities, divine or secular. Emancipation became a strong cultural motivation. In this moral sense, the post-modern is regarded as a continuation of modernity; it is modernity becoming conscious of itself. But becoming

conscious requires deconstruction of the unconscious failures of modernity.

In order to overcome the natural, inherited human incompleteness, learning and the acquisition of knowledge was inevitably necessary. This, in turn, needed teaching and education, which became a general sign of emancipation in the modern societies. The emancipation of human intelligence led to the maturation of rational thinking with the birth and emergence of the modern sciences in the sixteenth century, which then demonstrated their power through technology, industrialization and economic development. Moral emancipation was realizing itself through nation states, political activities, revolutions, societal changes and the emergence of democratic governments, but its contribution to progress is less convincing and more incomplete still than that of science and technology.

Furthermore, the myth of progress always remains intimately related to the views of nature held by humans. Nature is the ultimate base and source of matter, energy and space for human coexist-

ence on Earth, as well as a source of knowledge and learning, and even a framework for humanistic values of what is good, beautiful and true in life. Technology in turn is a means, an intrinsically human way, to contribute to human life on Earth within nature. We are to a certain extent what the visionary thinkers of the Enlightenment period thought of the future; we

<sup>1</sup> The study does not agree with the claims that a post-modern 'theory' should reject all metaphors of progress as irrelevant in a complex world view. (Bauman 1992).

# Views of nature from pre-modern to late-modern times

## Nature as a divine order

The idea of a perfect, divine order of constant nature can be found in the writings of the classical Greeks and Romans. Plato believed that nature was designed to meet humanity's needs. Cicero wrote in 44 BC: "Everything in the world is marvellously ordered by divine providence and wisdom for the safety and protection of us all... Who cannot wonder at this harmony of things, at this symphony of nature which seems to will the well-being of the world?" And further: "But for whom, it has been asked... We may... well believe that the world and everything in it has been created for gods and for mankind".

## Nature as organic whole

The organic metaphor stems from an idea of an organism, which passes through major stages from birth and youth to maturity and further to old age and death after a given space for reproduction. Organic nature has a history, and it is not constant nor does it maintain any state very long but is varying all the time. While the overall variation of organic events is known, the organisms enjoy individuality in details, and their course becomes unpredictable from the human point of view due to the variability of the unique situational factors and interactions. The organic metaphor of nature does not lead to a conclusion of the constancy and stability of nature as the metaphor of the divine order does. A continuous variation of nature, in a self-contained way, is 'natural' and inevitable.

The idea of the organic, varying nature was held by many earlier cultures, by the Ancient Greeks, Romans, Judeo-Christians and others. It can still be found in some 'primitive' cultures, but in western cultures it has lost any pragmatic value. The recent, so-called Gaia hypothesis of Lovelock can be seen as a late echo of the organic view. Nature as a machine and a stockpile of resources was substituted for the organic view of Nature.

## Nature as machine

Changing the metaphor from a living organism with magnificent structural fitness and organic appearance created by the Great Artist led to a view of the Earth as a machine functioning mechanically according to the magnificent laws of nature created by the Great Engineer.

Throughout the modern mechanistic metaphor, nature is seen as a perfect machine, which has a capacity to keep operating and maintaining and restoring its steady-state balance of operations even during perturbations, and which is composed of replaceable parts, and driven by cosmic energy from the sun. An influential and brilliantly articulated statement of the modern belief in the constancy and stability of machine nature can be learned from George Perkins March, the American father of environmental protection. In his book *Man and Nature* in 1864 he wrote: "Nature, left undisturbed, so fashions her territory as

to give it almost unchanging permanence of form, outline, and program, except when shattered by geologic convolutions; and in these comparatively rare cases of degradation, she set herself at once to repair the superficial damage, and to restore, as nearly as practicable, the former aspects of the domination".

An ideal machine nature is regarded as operating according to the laws of nature and its operations are regarded as readily predictable. Machines can be rationally re-engineered, which suggests that nature can also be repaired by humans. Machine nature has no preservable history nor individuality and no situational uniqueness or unpredictability. This 'wisdom' has been empowered and much applied by the industrial utilization of nature.

Mechanically ordered, constant and stable nature has until today been the predominant idea also in the science of ecology and in environmentalists' views. It has been a hidden or spelt-out pre-assumption in programmes of conservation and protection and also in national laws and international agreements on the management of living resources. Some scientists have raised doubts that the view of a steady-state machine nature may not be adequate but even misleading at all levels of the ecosystems or entire biosphere. These doubts are a part of the modern dilemma.

## Nature as evolution

According to the late-modern view, nature is always in change, and she has autocatalytic, self-organizing capacities, which are a *sine qua non* for life emerging and persisting on this planet. If not looked at through the old metaphors, we see that, wherever constancy has been sought in nature, change has been discovered instead and, wherever stability has been searched for, discontinuity, fluctuations, and evolutionary leaps have been the case. Nature even when undisturbed would not be constant in forms, structures or functions, but changing at every scale of time and space at her intrinsic 'natural' rates. Balance of nature does not exist and never existed; the variations and changes always dominated the scene of nature.

The old concerns about how to preserve nature undisturbed have transformed to the question of how to cope properly with nature, which is continuously changing. Life itself is dependent on changing; life is a far from equilibrium pattern of changing. Life is a change. Nature follows the rules and laws of a complex, evolutionary system probably common to all evolving phenomena whether material, social or mind-like phenomena in its essence (Laszlo). Bifurcations or branchings as from the modern to a post-modern view are natural, chaos-like patterns not excluded, and human life is a change agent for an evolving dynamic order. Sustainable development is a late-modern bifurcation of human evolution, wherein modernity is becoming conscious about its failures but also about the new available possibilities.

*(Based on Botkin 1990, Laszlo 1996)*

are their future fulfilled. But not without controversy. Just here a late modern antithesis is getting its momentum against the modernity.

## 8.2 The modern dilemma

The controversy about progress has arisen from two permeating concerns. One is the concern for people and other earthly creatures at whom the concept of progress is aimed and for whom what is best in life must be found.

The other concern is about the role of economic growth, science and technology in contributing to people's lives and changing it at the same time, for better or for worse. Industrial development has undeniably brought better living conditions for hundreds of millions of people especially in the western world and among its collaborators. Yet, there is also the other side of the reality: the poverty of as many or even more people has not been alleviated but is increasing faster than the world gross economic product.

Further, present-day technology in relation to nature has not resulted only in being a blessing, but is awkward and destructive as well. It is necessary to recognize facts and failures in global environment management, such as the depletion of ozone layer, climate change, ocean pollution, loss of biological diversity, unmanageable nuclear catastrophes, etc. Continuing trends offer no guarantee that future generations will be able to progress on equal terms with us, or even that all of our contemporaries will experience progress during their lifetime. This condition is a dilemma, a fundamental contradiction of the very idea of progress of the Enlightenment. It requires us to contemplate the very idea and to ask whether this dilemma is solvable or whether it means instead that we have to give up the very idea of progress, as some post-modern thinkers suggest.

The fastest economic growth without solidarity and sustainability, the most complete machinery of democracy without respect for the golden rule of ethics

common to all religions, and the most extensive freedom without dignity and responsibility for others cannot advance progress. An alternative would be an ethically nihilistic, plain Darwinian view of the lack of progress, 'un-progress', according to which everything which happens or will happen is optimally good and right just because it happens. Or what it appears justifies what it ought to be. The modern dilemma is a cultural and ethical one. The factual failures observed are just symptoms of a breakdown of the fundamental assumptions and basic myths of progress, nature and technology held to be true in western culture for centuries. A contradiction occurs between them and real achievements and a change of views is inevitable in the search for correction.

## 8.3 The late-modern transition

Researchers and philosophers in almost every field of enquiry talk about the present time as a great transition, and even anticipate a major shift to a new era. Recognition of failures in scientific management of the environment and failures to counteract poverty in the world is regarded to be part of the tremor. While, on the one hand, mainstream economic development and modern technology are valued as the sole nucleus of progress, they have, on the other hand, contributed to environmental problems and enduring disparity and poverty. Modernity is losing its momentum of progress in the true spirit of the Enlightenment.

A transition from the beliefs of modernity, dominant since the Middle Ages, to the new post-modern values and idea of progress is an evolutionary search. The earlier shift of views on progress comparable to this transition was that from the pre-modern to the modern era in the sixteenth century, and it took two to three centuries to mature. May we now expect – because of the faster development of technology and globalization of human civilization – a much faster shift to a post-modern era?

The late-modern transition will need its time to mature too and, meanwhile, human cultures are in a destabilized transient period between the two different eras. However, not all human societies will be changing at the same time or in a coherent pace to post-modernity, but rather the world will remain as the multi-layered and fragmented ensemble that it always has been. In the future as in the past there will be continuous tensions and disparities between culturally diversified parts of the human population instead of harmony and peace.

## 8.4 Views of nature from pre-modern to late-modern

The prevailing belief about nature is a crucial element of the idea of progress, and the pre-modern beliefs and metaphors of nature are different from the modern ones. Emancipation of knowledge with the development of science brought about a profound change not only to the idea of progress but also to the views of nature and the role of technology.

Two metaphors and explanations about the character of nature dominated pre-modern times. According to one, nature was a perfect, constant and divinely designed order and, according to the other one, nature was seen as an organic phenomenon, variable, renewable and with everything within it fitting perfectly. In modernity, the dominant views of nature were transformed to a machine metaphor. The views are described in the box on p. 46.

## 8.5 Sustainable development

In order to maintain the idea of progress, societies must respond proactively to the aims of sustainable development and, at the same time, deconstruct the interrelationship between the technological way of life and nature as represented by the modern machine metaphor. A view of sustainable development was articulated in the report 'Our

## Principia Ethica of Sustainable Development

- A. To fight poverty and unequal economic standing of the developing countries
- B. To stop depletion of nature and destruction of environment
- C. To secure that future generations will have the same opportunities for well-being as we enjoy
- D. Sustainable development is aimed to be socially just and equal, ecologically and economically sustainable, politically and culturally free and innovative

Common Future' by the UN environmental committee chaired by Mrs Gro Harlem Brundtland from Norway, in 1987, and made concrete in 'Agenda 21', the declaration of the UN Environment Summit in Rio.

Sustainable development in a broad context has distinct social, economic and environmental, as well as cultural aspects, which are all important to recognize. Ecologically sustainable development with appropriate economic and technological development included is a necessary element in this larger context, of which the two other parts are just and equal social development and democratic politics, and free and creative cultural development. These three dimensions give direction to the manifestation of sustainable development.

Based on the view of nature as evolution, a working definition of ecologically sustainable development may be formulated as follows:

*Human development is ecologically sustainable in relation to the environment if the interventions and effects imposed by human activities whether economic, technological, social or cultural do not alter the intrinsic rates of change of nature or the ecosystems in ways unmanageable by nature or irreversible from the point of view of future generations.*

This abstract and theoretical statement is a sufficient condition for a human/nature co-evolution, and it is possible to derive from it necessary conditions for sustainable welfare and sustainable technology.

Operationalization of the above definition leads to four strong requirements:

- (1) dematerialization of production,
- (2) immaterialization of consumption,
- (3) annihilation of rebound effect, and
- (4) long-term depopulation control.

They can be made more conceivable with a decomposition of the total environmental stress caused by human activities.

### 8.6 Decomposition of total environmental stress

A necessary condition of sustainable development derivable from its definition is that the total environmental stress on the environment imposed by human activities should not be increasing. The stress is here proposed to be measured with the total anthropogenic flow of material from nature (in the form of resources) through the technosystem (as goods) and back to nature (as wastes and pollution). A simple formula (Table 8.1) shows how the stress is composed of the three major contributing processes of human activity: population growth, material intensity of consumption and resource productivity.

A necessary condition of sustainability is now:

$$\text{total rate of stress} = \text{rate}/A + \text{rate}/B - \text{rate}/C < 0$$

The condition simply states that the total environmental stress should not increase. The ways and

means of fulfilling this condition must be based on the simultaneous control of the contributing processes. The operationalizations of (1) to (4) introduced above aim just at managing this condition of sustainability by requiring each contributing rate separately to meet the necessary condition, that is,  $\text{rate}/A < 0$ ,  $\text{rate}/B < 0$ , and  $\text{rate}/C > 0$ .

### 8.7 Dematerialization of production

$\text{Rate}/C > 0$  implies increasing resource productivity. It is to be achieved by better and more efficient technologies so that more and better production is provided with less use of natural and environmental resources; more from less, in all parts of the economy and life cycles of the products from raw material extraction and goods manufacturing to transport, marketing and services and life-long maintenance.

There are many untapped potentialities as Ernst von Weitzäcker, A.B. Lovins and L.H. Lovins presented to the Club of Rome in their report, 'Factor Four'. They claim that it is possible to increase the resource productivity of the world GDP through technology development by a factor of four in a few decades and by a factor of ten in a longer period. This means that the stress contributing effect of GDP/MF may drop to a quarter and then to a tenth of the current value.

### 8.8 Immaterialization of consumption

Some have argued that the GDP had no relevance in environmental stress accountancy. It is not true. GDP may have less and less relevance as a measure of the real welfare of people, but its relevance as a contributing factor of environmental stress is undeniable.

The GDP per capita is a kind of a measure of commercial material consumption in the world economy. The sustainable development principle tells that the rate of this measure should be diminishing,

or negative, in other words,  $rate/B < 0$ . This is, however, in direct contradiction to the overall economic policies of countries and international trade agreements. That is one indication that sustainable development is not an easy but a contradictory concept, and it may not be possible to pursue it without considering ethical issues.

One concern is to better understand welfare productivity, and to observe alarming empirical facts. According to this it has been decreasing since 1970s in western countries (Figure 8.1).

Neither material consumption nor economic growth is the ultimate aim of well-being, but only a better or worse means to it. Thus it is the concept of well-being which needs first and foremost to be ethically revised and, after that, we could consider what kind of material consumption and economic growth can best serve the revised end. Increasing the well-being of the population is a viable target if it can be achieved through increasing the welfare productivity of GDP. To increase the welfare productivity should be a basic aim of sustainable development. The issue can be formulated at world level as follows:

Increasing the welfare productivity, WF-PROD, is the way of achieving a decrease in material consumption, immaterialization of consumption, without compromising the needs of welfare. In practice, this would mean that our need structure would shift away from material-intense satisfiers towards social and cultural or spiritual needs satisfaction. It would make the world economy move more and more towards service-like production and consumption modes and structures.

### 8.9 The rebound effect

In the midst of the current, late-industrial transition and information society development, we are encountering one serious obstacle to the immaterialization of consumption. It is called 'the rebound effect' by sustainable development promoters. Under market frameworks, which are

**Table 8.1 Decomposing the total environmental stress into the three main factor contributions**

<i>Contributing process</i>	<i>Symbol</i>
A. The bigger the human population growth rate (% per year), rate/A, the stronger is the stress contribution	rate/A
B. The faster the growth rate of the world GDP per capita, rate/B, the bigger the increase of material intensity of consumption is, and the stronger the stress contribution	rate/B
C. The slower the rate of increase of the resource productivity of GDP, as measured by the ratio of GDP to the total material flow (MF) through the technosystem, rate/C=rate (GDP/MF), the stronger is the stress contribution	rate/C
D. Total rate of the environmental stress	rate/A + rate/B – rate/C

not adequately in tune with social and environmental externalities, dematerialization achievements could become overcompensated by an excess growth of world GDP-related material consumption. The total material use in consumption may increase by more than the amount of savings of resources brought by dematerialization of production and, of course, total material consumption is closely related to population growth and

solidarity or insolidarity of economic policies.

Recognition of the rebound effect is a new phenomenon and not many empirical measures are yet available. The analyses of it are the intellectual challenges of sustainable development. Figure 8.2 depicts how the rebound effect of world energy consumption well exceeds the savings from efficiency improvements.

Material consumption as measured by the World GDP per capita	World welfare per capita	Welfare productivity of World GDP
GDP/P	=	WF/P : WF-PROD
where WF-PROD = WF/ GDP is the welfare productivity of GDP		

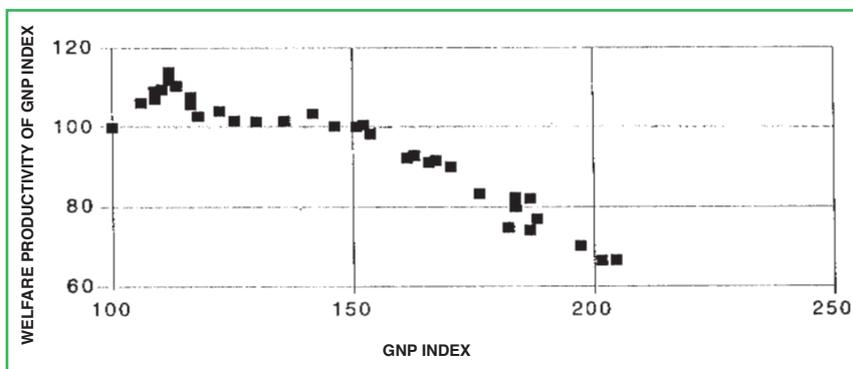


Figure 8.1 Welfare Productivity. Welfare productivity expressed as welfare per GNP and capita, related to GNP. Data from the United States in the period 1950–1986. Above a certain value increased GNP does not lead to a corresponding increase in welfare. (Source: Ekins, P. and Max-Neef, M., eds (1992) Real Life Economics. Understanding Wealth Creation. Routledge. London, New York.)

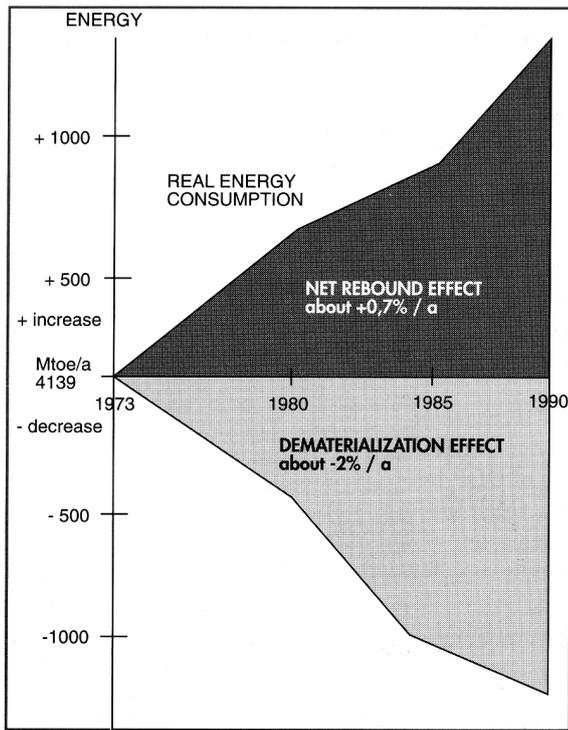


Figure 8.2 The rebound effect as illustrated in world energy consumption. Energy efficiency in 1973 (4 139 Megatonnes of oil equivalents were then used) increased up to 1990 by 2 % per year. But this did not lead to decreased consumption as in the same period the total consumption increased by 2.7 % yearly. The net rebound effect was thus 0.7 %. (Source: Sun, JiWu (1996) Quantitative Analysis of Energy Consumption Efficiency and Savings in the World 1973–1990.)

## 8.10 The depopulation process

A realistic vision of sustainable development inevitably requires putting an end to the population explosion and even a settling

Economic incentives are an effective means of the depopulation process, especially among those living in extreme poverty. For the first time ever, a real possibility of a better future for themselves and their children may be made

down of the world population at a lower level than at present in due course in the future. Contrary to this aim, however, the world population is growing, and no fast reduction of growth rates is expected in the developing countries. Depopulation control for sustainable development is a long-term aim, if only overpopulation does not become too severe a threat to sustainability too soon.

According to an analysis by a FAW working group, a significant reduction in the world population may be achieved by appropriate, economic and social incentives, and through substantial support to the less-developed countries from the richer world (Figure 8.3).

available by incentives. It is, however, evident that the population explosion will continue for some decades yet in any case. The depopulation process for sustainable development must get underway without delay. According to the model, the process may start to show an effect only after a peak of about 9 billion people. Other peak projections of the world population without incentive policies are bigger, ranging from 10 to 16 billion.

### Power of ethical awareness

*The mission of human beings is not to confirm their plain existence because it does not necessarily mean anything really essential.*

*The mission of human beings is not to secure life because life has its own means of taking care of itself.*

*Life wins whatever we humans do. Life persists with humans, but even without them.*

*The mission of a human being is to prove that life is richer and more precious with humans than without them.*

*Making life full of dignity and consciousness worthy of experience demands special human quality and awakening to ethical self-awareness.*

*The power of knowing thyself! It raised up many, some even above the ground. But those who stayed on all fours did not approve.*

Pentti Malaska

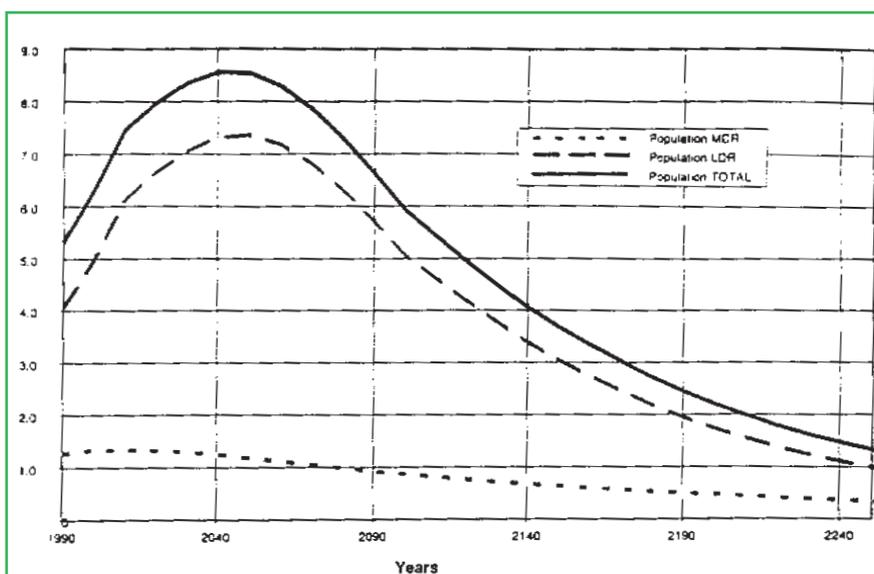


Figure 8.3 Possible development of population size in the more developed regions (MDRs) (lower curve) and in the less developed regions (LDRs) (middle curve), and total population (top curve), assuming appropriate economic and social incentives for population control. The target for 2 300 is 1 billion. (Source: Benking, H., Brauer, G.W., Fliedner, T.M., Grener, C., Malaska, P., Morath, K., Pestel, R. and Radermacher, F.J. (1996), Robust Path to Global Stability: Tough but Feasible. J. of the Finnish Institute of Occupational Health, People and Work. Research Reports (forthcoming).