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Title	Environmental gains and social losses? Critical reflections on the sustainability potential of telework
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Publication Date	2014
Publication Information	Hynes, M. and Rau, H (2014) Environmental Gains and Social Losses? Critical reflections on the sustainability potential of telework XVIII ISA World Congress of Sociology Yokohama, Japan, 13/07/2014- 19/07/2014
Link to publisher's version	https://isaconf.confex.com/isaconf/wc2014/webprogram/Paper67736.html
Item record	http://hdl.handle.net/10379/5336

Downloaded 2019-10-14T04:44:37Z

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Environmental Gains and Social Losses? Critical Reflections on the Sustainability Potential of Telework

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ARTICLE INFO

Keywords:
Telework
Sustainability
Mobility
Consumption

ABSTRACT

The reality of anthropogenic climate change and the consequences for society and environment is of growing concern to many worldwide. Sustainable Development - development which addresses existing human needs while preserving sufficient resources for future generations to meet their requirements - has emerged as a fundamental aspiration in efforts to reconcile the desire for economic growth and greater social justice with the need for environmental protection. Ecological Modernisation approaches that advocate a 'greening' of current economic and social systems through technological innovation have tended to dominate Sustainable Development debates. Technology is frequently perceived in (over)optimistic terms, with little evidence of measures to restrict growth-centric models of production and consumption.

Work takes up a considerable portion of people's lives whilst travelling to and from work has become a key feature of everyday mobility. A significant contributor to Greenhouse Gas emissions, the transportation of people and goods in its current form is deemed unsustainable. Teleworking has been suggested as a virtual mobility option which potentially can diminish the overall 'consumption of distance' associated with regular commuting. Given its emphasis on the application of technology to solve environmental problems, telework constitutes a prime example of an unsophisticated Ecological Modernisation policy approach. Despite the prominence of Ecological Modernisation rhetoric in environmental policy-making, rigorous theoretical and empirical testing of its key assumptions remains incomplete. This paper draws on a multi-method exploration of telework in Ireland to reveal current interpretations of Ecological Modernisation remain 'shallow' and largely limited to technological fix solutions, contributing little to curbing the consumerist impulses of contemporary economic models and lifestyles. The environmental benefits associated with telework are also questioned. Furthermore, any environmental sustainability gains attributed to telework frequently occur at the expense of individuals who work from home, their families and society, thereby bringing the three key pillars of sustainability into conflict.

1. Introduction

There is growing worldwide acceptance that human actions have (and are) impacting negatively on the planet (World Health Organization, 2012; IPCC, 2013). Efforts to reconcile the desire for economic growth with aspirations for greater social justice and better environmental protection have shaped international policy agendas in the latter part of the last century, with Sustainable Development emerging as a fundamental objective (WCED, 1987). Sustainable Development refers to development which addresses present human needs while preserving sufficient resources for future generations to meet their requirements. But it has been criticised as an ideological and political project that overemphasises economic and environmental concerns while paying limited attention to questions of social justice (Leach, Scoones, & Stirling, 2010; Bonds & Downey, 2012). Others have described it as an oxymoron which fails to fundamentally challenge prevailing economic and social structures and how and where we place ourselves in the milieu of ecology (Sachs, 1999; Latouche, 2010).

Concepts of Ecological Modernisation dominate the national, European, and global environmental protection policy-making agenda (cf. Wurzel & Connelly, 2010; UNEP, 2013). Ecological Modernisation theory is considered an optimistic school of thought suggesting that the economy benefits from greater moves towards environmentalism. It is claimed that environmental productivity can be the source of future growth, increasing energy and resource efficiency (Mol, Sonnenfeld, & Spaargaren, 2009). However, Ecological Modernisation critics claim that it fails to adequately protect the environment, doing nothing to alter the impulses within capitalist economic modes of production and consumption that inevitably leads to environmental degradation (Foster, 2002; Baker, 2007; Jackson, 2009; Barry, 2012). Moreover, the dominant focus of concern is the economy and growth, with fewer commitments to issues of actual ecological and social harm.

Work takes up a considerable portion of many people's daily lives so transformation in the nature and organisation of work has significant impacts on development, production, and consumption processes. Telework is a flexible working arrangement which enables employees work from home or

over-distance through the use of Information Communication Technologies (ICT); a case of moving the work to the workers rather than moving the workers to work (Nilles, 1998). It offers the means to suppress or eliminate certain journeys, in particular the daily commute to and from work, and thus is valued for the potential to diminish the negative environmental consequences of avoidable travel. Transport is a significant user of energy, burns most of the world's petroleum, creates air and noise pollution, and is a significant contributor to global warming through the emission of carbon dioxide (Fuglestedt, Berntsen, Myhre, Rypdal, & Skeie, 2008).

This paper critically examines telework's strengths and weaknesses as a 'virtual mobility' option, and its positioning within the three pillars of sustainability. Virtual mobility refers to the use of new and existing ICT as an alternative to physical mobility. Technology adoption and use, in the context of telework, and how it relates to society and the environment, also provides a useful approach to assessing the implications of Ecological Modernisation thinking. In addition, often 'hidden' patterns of consumption negate the environmental protection gains of telework, and this issue will also receive attention. The paper continues with an outline of the methodology employed before presenting the key assumptions of Ecological Modernisation and the significance of telework as a virtual mobility option. Key findings and results reveal the absence of policy or recent developments with regards to telework in Ireland, the inconsistency between Ecological Modernisation theory and policy practice, and the environmental sustainability credentials of telework are examined.

2. Probing (Tele)work

To assess Ecological Modernisation assumptions and the practice of telework, a desktop study of this method of working and evidential policy outcomes was undertaken, in addition to a mixed methodology combining quantitative and qualitative methods of enquiry (cf. Bryman, 1988, 2012). The quantitative element comprised principally of three separate surveys. The *Telework Survey* targeted workers in a multinational organisation which has pioneered flexible working arrangements in the past. The number of potential teleworkers was calculated at 114¹ and a total of 53 individuals took part, a response rate of just over 46 per cent. The *CONSENSUS Lifestyle Survey* (cf. Lavelle, forthcoming) sought an understanding of people's attitudes and behaviours towards sustainable household consumption and sustainability lifestyles, whilst the *Smart Moves Survey* (cf. Heisserer, 2013) was developed to obtain an understanding of how workers actually commute to and from work. It also sought opinions and attitudes on general issues of mobility and transport, and the environment. This quantitative data is not meant to be accurately representative due to the self-selective feature of the surveys employed, and the information is more explanatory and should not be deemed to be inferential in nature. The qualitative element of the research consists of sixteen semi-structured interviews with teleworkers. In addition, an extensive review of key publications, policy, legislation, and general public discourses was undertaken. The following section presents a short discussion of the key features of Ecological Modernisation theory and the relevance to the study of telework as a possible 'mobility suppressant', which relates to the development and adoption of technology.

3. Ecological Modernisation, Mobility, & (Tele)work

The broad contextual concerns in this paper are Society-Technology-Environment-Interactions (STEI) and how these relationships are understood and validated in the context of Ecological Modernisation thinking. Ecological Modernisation focuses strongly on the economy and technological innovation and development, and proposes that economic growth is allied to environmental protection. Its linked to the belief in continuing liberalisation of the world economy and has been described as a 'business as usual' model (Blowers & Pain, 1999). Key assumptions do allow for a broadening of environmental protection debates, in marked contrast to the high degree of polarisation that characterised ecological considerations throughout the 1970s and 1980s (cf. Dunlap, 1997). However, there are signs that robust techno-centric approaches to environmental management - an indication of 'weak' or 'shallow' Ecological Modernisation thinking - dominate environmental policy design both in the developed and developing world, with insufficient attention paid to social and political processes and conditions² (Oelofse, Scott, Oelofse, & Houghton, 2006; Leonard, 2011).

Drawing on the available literature in the area of Ecological Modernisation, a typology was developed for this research which identifies four key themes underpinning the theory (see Table 1). The first of these is; a belief that economic growth and environmental protection can be aligned and synergised. The second theme links Ecological Modernisation with gradual transformation in political and institutional arrangements concerned with environmental protection policy design. It is suggested that nation states will become more decentralised and consensual with policy-making influence and power diffusing to hitherto non-state actors and interested environmental groups (Mol, 2000). The third theme views Ecological Modernisation as a technological solution, repairing environment damage and positively contributing to future ecological protection. The fourth theme draws on work pioneered by Spaargaren (1997: concerning the relationship between the theory and consumption. The belief that (over)consumption can be restrained, or altered, through affirmative consumer choice and individual's pro-environmental decision-making lies at the heart of this thinking. These four themes cover key assumptions of 'strong' or 'deep' Ecological Modernisation theory (for a comprehensive critique see Christoff, 1996).

¹ This figure of potential teleworkers was provided by the Human Resources Manager.

² In a 2009 interview US President Barack Obama stated; "all of us are going to have to work together in an effective way to figure out how do we balance the imperative of economic growth with the real concerns about the effects we're having on our planet. And ultimately I think this can be solved by technology" (CBC, 2009).

Themes	Assumptions	Definition
Ecological Modernisation as a way to reconcile economic growth and environmental protection	<ul style="list-style-type: none"> The economy & environment can be aligned & synergised High environmental standards is a means of developing market advantage Economic growth, industrialisation, and capitalism are drivers of environmental reform Environmental concern is reflected through pricing, product development, and service provision 	The belief that a clearer understanding & appreciation of environmental protection is a precondition for sustained economic development and growth
Ecological Modernisation as the driver of transformation in policy-making arrangements	<ul style="list-style-type: none"> The nation-state will become more decentralised, flexible, and consensual Non-state actors & groups will assume new operational roles in policy-making It will be a break from the 'top-down' approach to one driven by social movements 'Political Modernisation' 	The belief that the nation-state can be transformed leading to former non-state actors assuming regulatory and administrative functioning
Ecological Modernisation as a technological solution to environmental damage and protection	<ul style="list-style-type: none"> Technological development can have favourable consequences for the environment Technology can be used to increase energy & resource efficiency Product and process innovation will allow clean technologies and substitutes for hazardous substances to materialise 	The belief that technology is not just a source of environmental damage but if used judiciously can be a source of efficiency, environment repair and protection
Ecological Modernisation as a means of curbing (over)consumption	<ul style="list-style-type: none"> Producer and consumer shape each other through information exchange Market dynamics will transform propagating environmental good, reflected ultimately by product demand Product life-cycle change – from 'cradle-to-grave' to 'cradle-to-cradle' to take account of product waste 	The belief that producers will be shaped by consumer choice and their pro-environmental decision-making, and will in-turn develop ecologically-friendly products & services

Table 1 – Table of Key Ecological Modernisation Themes

A good example of an unsophisticated techno-centric Ecological Modernisation approach is that of telework. Telework occurs when ICT is applied, enabling work to be accomplished at a distance from the location where results are required or where work would traditionally have been performed. The practice of telework has been heralded as a cure for a variety of organisational and social problems. It has been proposed as a strategy to help organisations reduce their infrastructural and utilities costs (Egan, 1997; Van Horn & Storen, 2000), of responding to employee needs for an enhanced work-life balance (Shamir & Salomon, 1985; Hilbrecht, Shaw, Johnson, & Andrey, 2008), and a way of promoting social inclusion for people with disabilities or who have been previously excluded from the workplace (Hesse, 1995; Anderson, Bricout, & West, 2001).

Telework is also proposed as the means of diminishing traffic-related environmental impacts, such as air and noise pollution, by reducing or eliminating the daily commute (Irwin, 2004; Dwelly & Lake, 2008). In an apparent shift in transport policy, the Irish government's *Smarter Travel* initiative sought to promote more ecologically sustainable modes of transport, such as walking, cycling, and public transport, in opposition to prevailing and environmentally damaging car-dependent travel behaviours (Irish DoT, 2009). A principal feature of *Smarter*

Travel was the promotion of telework³ as part solution to carbon-intensive commuting practices thus helping to decrease the overall 'consumption of distance'.

However, the use of ICT does not inevitably lead to the substitution or suppression of travel (Mokhtarian, 1990, 1991, 2003), and there are additional consumption consequences from the need to acquire or update technological equipment, infrastructure, living space, and other such lifestyle adjustments (Arnfolk, 2002). Telework continues to be poorly understood particularly in terms of its social and environmental consequences. A more critical sociological engagement is required to assess this practice and its material impacts on society and the environment. The research outlined in this paper, which have broad international implications, uncovers some frequently concealed features of telework to highlight how this way of working can (or indeed if it should) be further developed and implemented. Significant domestic and social implications for people who choose to work from home are explored. Indeed, with regards to technology promotion, use and adoption, telework is a useful indication of wider sustainability questions and concerns.

³ *Smarter Travel* refers to telework as eWork.

Ecological Modernisation is broadly espoused as a policy instrument for environmental protection. It embraces the current trajectory of economic growth as the precondition to development, albeit that this it is also mindful of environmental damage and protection. As Ecological Modernisation thinking becomes more established in many European and national policy-making forums (cf. Couturier & Thaimai, 2013), policies reflective of this position ought to be evident. In the case of telework, it is anticipated that such transformation in working arrangements benefit both the economy and the environment. The logic of Ecological Modernisation suggests that telework should be embedded in the philosophy of many organisations, as well as being accepted by local, national, and European decision-makers. But the reality is often different.

4. (Working) Home Alone: The Teleworkers Experience

The foremost national telework data, from an Irish perspective, was published over ten years ago in the *Quarterly National Household Survey* in which just 3.5 per cent of the workforce were considered teleworkers (CSO, 2003). More recently, the *Telework in the European Union* report investigated rates of telework within the European Union (EU), particularly in the context of the *European Framework Agreement on Telework* (Eurofound, 2010). This revealed that the rate of teleworking in Ireland was 4.2 per cent of the workforce, with the European average standing at 7 per cent. Indeed, across Europe the report found a marked difference in regional, national, and even local and organisational terms. The figure for teleworkers within the EU had been expected to triple by 2010 (Bates & Huws, 2002) but the actual figure has fallen short of these optimistic expectations. In fact, the recent announcement by Yahoo CEO Marissa Mayer to discontinue all telework arrangements (The New Yorker, 2013) suggests a potential reversal in such trends.

It was anticipated that deregulation of telecommunications, price reductions and performance improvements, would allow telework become a conventional method of working (Callanan, 1999). However, despite early enthusiasm there is an absence of policy or legislation in this area. Three separate departments of government allude to telework in Ireland; The Department of Environment, Community and Local Government, The Department of Transport, and the Department of Jobs, Enterprise and Innovation. Both environment and transport interests view telework as the means to suppress travel related to the daily commute to work, albeit environmental advocates seek reduced pollution and resource use while transport pursue reductions in infrastructure requirements. Telework is perhaps most appropriately allied to employment, but this is not currently the case in Ireland. The consequence of this administrative uncertainty and confusion has, heretofore, remained largely unexplored. The result of such imprecise demarcation of responsibility has led telework to 'fall between the cracks' of various departments of government and accountability. This has led to the lack of any policy or regulation, ambiguous and imprecise direction, and a vague understanding of the actual realities of telework and teleworkers' lives.

According to many teleworker interviewees, in their experience the practice of telework is frequently implemented in an ad-hoc and unregulated manner leading to unpredictable and erratic administration:

I would say they don't condone it or they don't condemn it's whatever your manager says and if you are as productive as you need to be, but they probably won't take a stance either way [Teleworker 7, female, aged 40-45, employee].

One manager articulated the view that the absence of regulation, and indeed disregard for existing employment legislation, was responsible for a certain indifference to the practice of telework:

I think people just got so scared when they realised all the implications and they say 'we'll do everything ad-hoc instead because we don't want to acknowledge it', I mean officially I'm not acknowledged as doing this because I'm breaching the amount of hours I do, it breaches the health and safety act if I had to record them all [Teleworker 11, female, aged 40-45, management].

Nevertheless, there are a number of potential benefits that can accrue to individuals, organisations, society, and the environment from having people work from home for part or all of the week (cf. SusTel, 2003). Individuals can improve their work/life balance with the additional autonomy and flexibility afforded, in addition to savings in travel costs. Organisations could profit from a more contented workforce, in addition to out-of-office hours working, crisis planning, and productivity gains. Society benefits from the broadening of the work pool and allowing people to live and work in rural and remote communities, whilst the decrease in commuting helps alleviate the damaging environmental effects of unnecessary travel. But many of these advantages are challenged by increasing domestic transformation and the often stressful conflict between private and work dualism some individuals struggle with when teleworking (Othman, Yusof, & Osman, 2009). Frequently uncritical interpretations of telework fail to adequately account for teleworker's actual experiences leading to the implementation of ad-hoc schemes and unintentional outcomes.

The meagre uptake of telework is emblematic of this lack of practical legitimacy for the practice amongst policy-makers, business leaders, and indeed workers themselves. This position was repeated in different ways throughout the interviews when teleworkers discussed instances of the practice:

Within our organisation locally and nationally I think it's a relatively rare phenomenon [Teleworker 1, male, aged 25-30, employee].

No I don't think it's promoted at all, I certainly have heard absolutely nothing with regard to teleworking [Teleworker 12, female, aged 30-35, employee].

Despite the dearth of telework arrangements and schemes, teleworkers strongly claim to regularly work longer hours and are more productive working from home. This was a recurrent and forceful refrain running through most of the interviews:

I would work longer hours because I wouldn't be standing at the printer chatting or going for coffee [Teleworker 16, female, aged 35-40, employee].

Although there are obvious organisational benefits from increased working hours, greater flexibility, and productivity gains, there are considerable misgivings about telework and a level of distrust for the practice which emanates from management and employers. Many managers interviewed, although they themselves frequently teleworked, were concerned about the changing circumstances to their traditional role of supervising work and workers:

As a manager you've no way to monitor the hours people are working or what they're doing [teleworker 2, female, aged 35-40, management].

For many workers, the social consequences of telework are often neglected in favour of the economic benefits for employers. Indeed, many of the costs of telework are outsourced to the individual worker with limited assistance from employers. Personal, family, and community issues are often subordinate, again de-legitimising telework for many:

She ((his fiancée)) normally leaves at seven o'clock in the morning and it can often be that I don't see a soul until she comes back, so it can be a bit isolating [Teleworker 1, male, aged 25-30, employee].

There's a sense of not being at home when you're at home, there's a sense of still being at work [Teleworker 2, female, aged 35-40, management]

Teleworkers spoke openly of the overlapping of work and private domains in different ways. It was expressed as a feeling of intrusion at time by some who spoke of planning and unravelling their complex time commitments:

If you're working from home you need to make that difference between what's my time and what's work time, and sometimes it's possible sometimes it's not [Teleworker 6, male, aged 35-40, employee].

The impact of work on home life and the lack of influence and employee participation in some telework arrangements are changing the nature of work for teleworkers, often unconsciously established and frequently skewed in favour of employers. There is intrusion into the private sphere but an acceptance of such inevitability:

There's this overwhelming desire to say 'oooh what's on that there now' and that can be a little bit intrusive [...] there is a little bit of an expectation to take work things in-between, but I have no problem with that [Teleworker 14, male, aged 35-40, employee].

For other (interestingly exclusively female) the temporal flexibility afforded when working from home allowed domestic chores to replace the social elements of working in an office:

At eleven o'clock I might put a wash on or do a quick hover ((vacuum)) rather than where if I was in the office I might sit down for fifteen minutes have a cup of tea and chat to the girls [Teleworker 12, female, aged 30-35, employee].

The issue of gender and its association with telework suggests that women's daily life patterns continue to be heavily influenced by this private/work dualism. Gurstein (2001: maintained that such dualism impedes the legitimacy of women's home-based work. Each teleworker was asked if they felt that telework was more suitable for men or for women. The male interviewees all replied that there was no difference and at issue were the tasks or job to be performed. The female interviewees were much more reflective and circumspect in their responses. Many echoed their actual experience of juggling work and domestic commitments and were cognisant of the conflict between the private and work domains from time-to-time:

I would imagine it would be easier for men because if you're at home in a house women are the one who see things that need to be done [Teleworker 7, female, aged 40-45, employee].

For some teleworkers there is a perception of harm to upward organisational mobility and damage to promotional opportunities for people working from home. Much of this relates to the reduction, or indeed total absence, of face-to-face co-presence afforded individuals working at the same location:

If you have face-to-face contact with them you get promoted, they know you [Teleworker 6, male, aged 35-40, employee].

Teleworkers did express a feeling of autonomy and independence to work in a very personal manner, but also felt the pressure to meet imposed deadlines (largely emanating from traditional centrally-located nine-to-five worksites) while working longer and irregular hours to meet global organisational commitments. Several interviewees stated that working arrangements were largely planned and controlled by their employers to meet the nine-to-five requirements of other countries, while others felt the unstructured nature of telework has allowed organisations abdicate some responsibility for their employees:

It's just something that they turn a blind eye to because there's no support structure in place [Teleworker 4, male, aged 40-45, employee].

The lack of worker participation and weak control of many telework schemes, policy and decision-making, has allowed a vacuum of practical and helpful information, legislation, and structure to evolve over time. Individuals spoke about the absence of information and training, with regards to telework, and the skills needed to work in this way:

I wouldn't know where you'd get some info in terms of how best to engage with time management and task analysis or anything like that [Teleworker 15, male, aged 35-40, management].

Despite this, teleworkers felt an explicit sense of gratitude to their employers for being allowed to work from home. Many acknowledged that they worked longer and more productively but yet were grateful to their employers for the opportunity to work from home:

You get a little more time out of people when you've given them the freedom to work on their own and in their own environment [Teleworker 15, male, aged 35-40, management].

There is little in the way of additional or high-end equipment or technical skills required to work in this way with many interviewees stating the importance of discipline, coping, and self-motivation:

The most important thing about working from home is that you have to be the type of person who can cope with working on your own in isolation... you have to be self-motivated [Teleworker 9, female, aged 35-40, contract employee].

The experiences of teleworkers suggest that pre-existing communication equipment, long established and now orthodox within working environments, is what is required to work effectively from home. At the same time, domestic disruption stimulated by individuals setting up office in their home is often underestimated. Personal coping mechanisms and building on existing communications skills rather than the ability to use technology are key competencies required for successful teleworking. This suggests a role for technology in telework development but highlights the significance of prevailing social practices in relation to work.

The ubiquitous nature of technology use and adoption is often underestimated, and its effects on society not always properly acknowledged or appreciated. Technology has crept unhindered into many aspects of daily lives without due consideration to the consequences of such adoption

processes⁴. Technologies are now used in an unconscious almost unnoticed indifferent manner. In the *Telework Survey* participants were asked if strong technical knowledge and skills were needed to successful work from home and a five-point Likert scale of options ranging from 'strongly agree' to 'strongly disagree' was provided. 28.6 per cent either agreed or strongly agreed, 8.6 neither agreed nor disagreed, while 62.9 per cent disagreed or strongly disagreed. Given the often complex nature portrayed by some of the practice of telework, teleworkers themselves frequently view the technologies they use as manageable and often incidental to the tasks they are required to accomplish.

5. Telework's Environmental Prowess

While the potential benefits of telework for the economy are apparent its adoption as an instrument of environmental protection is not directly evident. For example, there is strong indication of people's general concern for environment protection in the surveys but this unease did not translate into practical environmental activism or changes in work practices, including the decision to telework. Instead, it is frequently economic, social, personal, and political issues that take precedence. Workers in Ireland remain dependent on private cars to travel to work at a central location (CSO, 2012).

New technology has the potential to contribute to environmental protection and repair. However, this view of technology regularly fails to consider the ways in which people select and appropriate their artefacts, and the strong production and consumption forces at work. In the case of telework, the use of ICT is suggested as an approach to reducing the daily commute to work, in addition to reducing additional requirements for work travel. Thus, in this instance, technology use in the context of changing working organisation is viewed as ecologically positive (Verbeke, Schulz, Greidanus, & Hambley, 2008). But what are the most important technologies for teleworking? When asked this question most teleworkers responded that it was typical communication equipment now conventional in the workplace rather than any new equipment, tool, or device:

I got broadband I've got a phone I've got my mobile and I've got a landline as well, so I've got all the things that I really need to communicate [Teleworker 13, male, aged 55-60,

Telework is transforming consumption in other way, heretofore, underreported or previously overlooked. For instance, some teleworkers have relocated their families further away from their workplace than would otherwise have been practical, thus increasing the distance between their home and workplace:

I lived in Dublin but then once I got married we moved down the country so teleworking was more appealing really, although it was an option whenever I lived in Dublin but because I lived so close I didn't avail of it [Teleworker 8, male, aged 25-30, employee].

The study of telework, in the context of such life cycle changes, is not widely explored in the literature but the interrelationship of home-based telework and (changing) family life and circumstances is a crucial consideration for understanding the development of the practice. Early research on this subject would suggest that an understanding of such issues can lead to improved selection criteria for choosing

potential teleworkers, the generation of guidelines for workers, assist with longer term staff planning, and highlight problems which may arise between teleworkers and managers (Haddon, 1991). Ultimately, and given the nature of telework, situations and preferences may vary between families and individuals but such life cycle stages research would provide the basis for managers and staff to discuss the details of any telework arrangements.

Indeed, the changing nature of work for many has led to teleworkers travelling more due to new working activities and connections. Telecommunications, in this regard, is complementary rather than a direct substitute for co-presence and close proximity interactions:

I'm going in two weeks' time to the UK and the whole team's coming together from all over the world from America from parts of England there's a good few people from Dublin as well [Teleworker 1, male, aged 25-30, employee].

Teleworking, and the flexibility afforded, facilitates additional shopping opportunities as individuals have autonomy and specific freedom of movement during break times when working from home. Such changes to daily routine (which are habit forming) have significant implications for consumption. Many aspects of consumption are habit-like (Warde & Southerton, 2012) and Shove (2003: maintains that habits are not just changing but are changing in ways that imply escalating and standardising patterns of consumption.

During the day, maybe during lunchtime we'd say, I might pop out and do a quick bit of shopping [Teleworker 3, male, aged 35-40, management].

Other teleworkers felt that there is changing needs or additional consumption requirements associated with working from home, both in terms of economic and environmental costs. This was primarily additional energy usage, such as heating, lightings, and electricity, associated with communications equipment and conventional domestic practices such as eating:

If you have to add up everything every small thing say like I'm using up electricity I'm using up heat I'm using up say I'm boiling up my kettle I'm using up electricity at home rather than ((at work)) and my internet... [Teleworker 6, male, aged 35-40, employee].

The question of (un)sustainable consumption and the potential merits of telework in reducing the ecologically harmful 'consumption of distance' is highly pertinent. Considerations of telework's implications, in terms of consumption, are largely limited to a single-issue focus of transport. Telework is promoted on environmental grounds due to its potential to suppress or eliminate the daily commute, but many studies are merely concerned with this singular issue of mobility. Owing to its complex interconnected nature, a much clearer understanding of the environmental sustainability consequences of telework which builds on this research is desirable. The *Telework Survey* inquired from workers if they agreed or disagreed with the statement that their consumption increased when working from home. Participants were requested to evaluate their consumption patterns when working from a central office and compare these with times when they worked from home. Although common social science measures of pro-environmental behaviour can sometimes be weakly related to the actual environmental impact of people's behaviour (Stern, Dietz, Abel, Guagnano, & Kalof, 1999) many social scientific studies use a self-reported measurement. Contrasting the figures for respondents who agree and strongly agree with those who disagreed and

⁴ In *Techno-Fix*, for example, the unintended consequences of the adoption and normalisation of the automobile, including the high number of traffic deaths and injuries, environmental damage, and urban sprawl, are exposed (Huesemann & Huesemann, 2011).

strongly disagreed - and eliminating the undecided - the self-reported impacts on general consumption are listed in Table 3. The extent that this consumption is offset by reductions in the workplace remains largely unexplored (Kitou & Horvath, 2003).

Category of Domestic Consumption	Reported Increase
Food consumption	Yes
Energy consumption	Yes
Travel consumption	No
Additional goods & items purchased	No
Water consumption	No
Waste produced	Yes

Table 2 - Self-Reported Changes in Consumption Due to Telework (Hynes, 2013)

6. Discussion

Telework and its environmental sustainability attributes are not comprehensively understood and there is need to widen the scope of inquiry to include other general consumption practices. All the environmental implications of telework must be made explicit through empirical research to validate its environment sustainable reputation. While travel may decrease due to a reduction in commuting it may also increase on days workers actually commute as individuals elect to live further away from their place of employment, often motivated by telework. In addition, the nature of working over-distance forges new relationships that need to be developed through face-to-face contact stimulating new travel opportunities. Other underreported patterns of consumption for teleworkers include increased technology and energy use in the home, and the flexibility afforded individuals helps to generate additional opportunities for shopping and overall occasions of consumption.

Ecological Modernisation is an attempt to move environmental protection debates away from the confrontational positions of the past. In this paper, a typology of four key themes that underpin Ecological Modernisation theory was developed, in line with existing debates and literature on the subject. However, given the total lack of policy in relation to telework in Ireland it is difficult to assess or test Ecological Modernisation assumption with regards to this way of working. Nevertheless, based on the desktop studies undertaken it is reasonable to state that Ecological Modernisation theory and policy are understood differently. Ecological Modernisation theory can be defined as deep and is a carefully considered approach that acknowledges and considers many aspects of Society-Technology-Environment-Interactions. Ecological Modernisation policy, in relation to this particular study of telework, is a very shallow interpretation of the theory which

embraces innovation and technology (principally in public discourses on the practice) for the role it can potentially play in environmental protection, and little else. Yet, to-date in Ireland no evidence of legislation, regulation, or policy initiative in relation to this role is apparent.

Telework lacks the necessary oversight essential to legitimise it for both employers and employees. The *laissez-faire* approach adopted by policy-makers allows employers retain ultimate discretionary powers over telework arrangements and conditions. Many employers fail to appreciate or recognise the real issues and concerns of teleworkers which is leading to ad-hoc and disorganised arrangements, to the detriment of this way of working. Given this legislative and regulatory vacuum in Ireland, policy-makers and key decision-makers must assume that technology, with respect to its inherent nature, is value-neutral and autonomous (cf. Huesemann & Huesemann, 2011) bringing about only positive impacts and consequences. Many such decision-makers adhere to an (over)optimistic understanding of the power of technology in terms of social and environmental change processes, and often an uncritical acceptance of innovation and development.

1. Conclusions

While the technology to work from home has been widely available for some time now, there is continuing reluctance and apprehension on the part of many employers, and indeed employees, to embrace telework. What is broadly neglected is the private/work dualism; the multifaceted domestic and social interactions people struggle with when working from home. Simply promoting the environmental sustainability merits of telework frequently brings the other pillars of sustainability (economic and social) into conflict. Furthermore, in the Irish case an existing neo-liberal state, chronic car-dependency, and a lack of telework guideline or schemes reflect classic shallow Ecological Modernisation thinking. An approach suggestive of neo-liberal environmentalism is evident in which individual organisations are given absolute freedom over any such working arrangements leading to a stagnation of the practice overall. The environmental sustainability of telework is also uncritically accepted without due consideration to social and cultural dimensions of sustainability. There is a need for longitudinal research to ensure that any environmental sustainability gains brought about by telework are properly evaluated, in particular in relation to possible consumption changes with regards to energy, water, food, and technology use, and if these are (or can be) offset by diminishing consumption in the workplace. Much of the early enthusiasm shown on the subject of telework has long since faded in an atmosphere of ambiguity and uncertainty, along with out-dated web portals and reports. In a world frequently characterised by technological progress, the time may be right to re-visit the subject of telework in a more pragmatic and critical manner.

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