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Mary-Jo Lavelle and Frances Fahy

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What's Consuming Ireland? Exploring expressed attitudes and reported behaviours towards the environment and consumption across three case study locations on the island of Ireland

*Mary Jo Lavelle^a and Frances Fahy^b

^a School of Health Sciences, National University of Ireland Galway, University Road, Galway, Ireland

^b School of Geography and Archaeology, National University of Ireland Galway, University Road, Galway, Ireland

Abstract: Household consumption levels are escalating across the island of Ireland. Although emissions from transport and construction sectors have experienced a temporary decrease due to the economic downturn, overall emissions are increasing. Despite this, there is a lack of baseline data on three key consumption areas that impact significantly on the environment: water, transport and energy. To address this gap in knowledge, the CONSENSUS Lifestyle Survey (CLS) was developed and implemented to explore expressed attitudes and reported behaviours towards the environment and consumption across the Republic of Ireland and Northern Ireland. Opening with a critical review of previous perspectives adopted within attitude and behavioural research, this paper outlines the development of the CLS. Drawing on a survey of 1,500 respondents across three case study locations between 2010 and 2011, this paper adopts a framework of environmental behaviour to discuss the findings under the themes of 'environmental concern variables', 'situational variables' and 'psychological variables'. Despite the expression of high levels of environmental concern and positive attitudes towards environmental protection and conservation, results reveal the persistence of value-action gaps. Results indicate the importance of structural variables for shaping consumption behaviours, such as availability of services and the built environment in particular sectors. Socio-demographic factors were found to be important influences on the adoption of water-saving actions. Inflexible social norms about communal sharing and ownership of goods were also highlighted. The research reported in this paper provides a comprehensive response to international calls for baseline data on consumption behaviour.

*mary.lavelle@nuigalway.ie

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Introduction

A comprehensive evidence base is essential for the development of effective sustainable consumption policy (Scholl *et al.*, 2010). Baseline data on consumption patterns are needed globally to assist policymakers, researchers and numerous other actors to better understand consumption behaviour (OECD, 2013). To date, the role of social science's evidence base is often disregarded or overlooked when developing effective sustainable consumption policy. Instead, research nationally and internationally has focused on the collation of technical data related to products and services.

As the scale of environmental challenges is becoming increasingly globalised, the spotlight has shifted towards individual consumers as 'agents for change' (Barr *et al.*, 2011). This focus acknowledges the power that resonates within individuals' decision-making processes and their consumption behaviours. Many academics are now turning their attention to the complexity of human behaviour (Barr *et al.*, 2011; Chatterton and Wilson, 2014; Lavelle *et al.*, 2015). Therefore, research investigating the comprehensive psychological understanding of the drivers and barriers behind household consumption behaviours is essential if policymakers wish to implement successful action-plans or roadmaps to encourage more sustainable consumption behaviours. Geographers and social scientists have contributed significantly to this understanding, noting that consumption behaviour is determined by the complex interplay of many factors, other than attitudes alone (Barr, 2008; Stephenson *et al.*, 2015). Consumption behaviour is influenced by a wide array of complex, interrelated factors such as demographics, income and prices, policies and infrastructure, as well as social, cultural and psychological factors. Hence, an appreciation of this complexity, together with an improved understanding of how and why people consume, is a crucial initial step towards ensuring that steps taken to shift consumption behaviour towards greater sustainability are effective, appropriate and just. An overview of some of these factors is discussed in the following sections.

In the context of the island of Ireland, a lack of baseline data has meant that household level consumption has remained a black box for policymakers (O'Gallachóir *et al.*, 2007). Consumers have been an extremely difficult target for policy-makers aiming to encourage more sustainable practices, particularly because of the political difficulties inherent in constraining how people should live. In an earlier *Irish Geography* article, Davies *et al.*, (2010) suggested that there were four key reasons for this: a lack of appropriate data, weak understanding of behavioural dynamics, crude governing technologies, and a lack of integration between production, consumption and regulatory stakeholders. Two of the central objectives of the research reported on in this paper were formulated to address some of these gaps. Firstly, the research aimed to collect and establish detailed,

comprehensive and coherent baseline information on basic consumption patterns on the island of Ireland. Secondly, this research aims to provide an improved understanding of why people act in the ways that they do. The empirical data reported in this paper form the foundations of a wider large-scale research project in the Republic of Ireland and Northern Ireland on individual and household consumption entitled the CONSENSUS Project¹. The data capture individuals' expressed attitudes and reported consumption behaviours concerning water consumption, transport behaviour and energy use². These key sectors have been identified as areas of high environmental impact in relation to household consumption (OECD, 2013; Michaelis and Lorek, 2004).

This paper provides a brief review of previous approaches to researching attitudes and behaviours. The importance of both internal and external factors on behavioural change are outlined. Following this review, the development of the survey tool employed to investigate expressed attitudes and reported behaviours in an all-island context is discussed. Several challenges involved in capturing quantitative data on attitudes and behaviours are also highlighted. The results section provides an outline of the trends emerging from the survey data. The subsequent discussion highlights the impact of various factors on individual behavioural change, and highlights key opportunities and obstacles towards achieving more sustainable consumption practices.

Researching attitudes and behaviours

Many authors in the field of environmental psychology and sociology (e.g., Fishbein and Ajzen, 1975; Hines *et al.*, 1986) have relied predominantly on various forms of the 'attitude-behaviour model' to explain and understand individual consumption behaviour. These linear models of behaviour utilise individual attitudes to predict the occurrence of future behaviour of individuals (Spaargaren, 2003). This dominant academic approach to researching behavioural change has been criticised for offering an impoverished view of behaviour as it fails to acknowledge the wider social contexts in which individuals act. Many authors argue that such a micro-level view fails to consider how consumption is embedded in the specific social and cultural context in which individuals interact (Barr and Prillwitz, 2013). The so-called 'Value-Action Gap' (i.e., the gap which can often be observed between people's pro-environmental attitudes and their everyday environmentally damaging actions) confirms this criticism that attitudes

¹ The CONSENSUS (consumption, environment and sustainability) Project comprises seven-year research collaboration between NUI, Galway and TCD focusing on four key areas of household consumption: transport, water, energy and food (see www.consensus.ie). The project is the first of its kind to examine the factors that influence consumption behaviours and lifestyles in an all-island Irish context. For more detailed discussion and analysis of each of these core aims of the CONSENSUS Project, please see Davies *et al.*, 2014.

² Food consumption issues and increasing levels of food waste are important obstacles in terms of achieving a shift towards sustainable consumption across the island of Ireland. Although the CONSENSUS Project explored these topics, this paper focuses on results for water, energy and transport.

alone cannot predict actual behaviour of individuals. Numerous authors have argued that any assumed causal link between attitudes and behaviour is mediated by cognitive processes, including social and cultural norms, beliefs and values, and wider contextual factors such as the level of technological innovation or the provision of necessary infrastructure (see Stephenson *et al.*, 2015; Gatersleben *et al.*, 2012; Barr, 2008; Blake, 1999).

Geographers and social scientists such as Barr (2008) propose that framework approaches provide a more comprehensive and holistic approach to understanding consumption behaviours by addressing the problematic constrained nature of attitudinal-based models and incorporating the influence of wider contextual factors. Barr's framework of environmental behaviour (see Barr, 2002) is an example of a framework that offers additional insight into environmental behaviour. Barr's framework, although based on the theory of reasoned action (Fishbein and Ajzen, 1975), is flexible in its structure. It proposes three key sets of factors that influence intentions and environmental behaviours: social and environmental values, situational variables and psychological variables. Within Barr's work, social and environmental values influence an individual's intentions and behaviour towards the environment, and both situational and psychological variables then intervene to modify this relationship (Barr, 2002). Social and environmental values refer to underlying concerns and values held by individuals towards the physical environment. Situational variables relate to a person's situation, including individual demographic factors such as income, education, household size, residence type and ownership. Environmental knowledge and structural issues (such as infrastructure and the built environment) come under this heading of situational variables. The third broad group of factors incorporates psychological factors and includes variables such as self-efficacy, issues of responsibility, and societal norms and social pressures.

Barr's framework corresponds to recent approaches by other scholars who emphasise the importance of both internal and external conditions³ which shape human behaviour (see Thøgersen, 2005; Jackson, 2009). External (or contextual) conditions relate to socioeconomic conditions (e.g., educational attainment, employment status, occupational status and level), living circumstances (e.g., place of residence, household income, household size), as well as to social norms, infrastructures or so-called 'systems of provision' (Southerton *et al.*, 2004). While internal conditions can influence people's knowledge and motivation to act, external conditions affect the possibility of people undertaking pro-environmental actions, regardless of their motivation to act (Tanner *et al.*, 2004). External factors, such as the infrastructure in a region, the architecture of incentive structures and schemes, institutional barriers, inequalities in access, as well as availability of

³ External and internal factors are terms employed for the purposes of this paper; however, there are numerous subjective categories and frameworks which have been developed to examine factors influencing behavior. For example, Davies *et al.*, (2010) grouped factors in relation to political, economic, socio-technical, sociological and socio-psychological factors. For a comprehensive review see Lavelle (2014).

services, can all play an important role in consumer lock-in and ultimately lack of environmental action (Stephenson *et al.*, 2015; Sanne, 2002). As a result, individuals are not always autonomous in their decision-making processes for reasons beyond their immediate control. Lock-in can also result from habits, routines, social norms and expectations, and dominant cultural values (Jackson, 2005).

Impacts of pro-environmental behaviour are offset by contextual behavioural factors (Martinsson and Lundqvist, 2010). Highly restrictive or supportive external conditions can distort differences between the behaviour of consumers with and without pro-environmental attitudes. For example, the attitude-behaviour relationship was found to be strongest when contextual factors are supportive (Guagnano *et al.*, 1995). With highly supportive external conditions, individuals with negative environmental attitudes have a tendency to behave in an environmentally sound way. In contrast, highly restrictive conditions could discourage individuals with extremely positive environmental attitudes.

Situational or external factors such as crisis situations can also give rise to policy changes. For example, the impact of the economic recession on the sustainable consumption agenda could be interpreted as a threat or as an opportunity for policy (Hinton and Goodman, 2010; Fahy *et al.*, 2014). Restrictive household income could potentially provide a greater incentive to purchase more durable commodities and subsequently promote more sustainable consumption in this manner. Households with reduced income may be compelled to change their consumption behaviour due to economic necessity (Lavelle *et al.*, 2015). At the same time, it should be noted that advancements in 'product-based approaches' to sustainable consumption are not completely compatible with periods of economic downturn. For example, sustainable products (such as organic or fair trade goods) tend to be expensive, which potentially makes them less attractive options when compared to cheaper less sustainable options (Hinton and Goodman, 2010).

The global financial crisis in 2008 and the bursting of the property bubble in Ireland have also prompted a renewed interest in alternative approaches to economic and social development that move beyond the growth logic of capitalist systems of production and consumption (Fahy *et al.*, 2014). The economic downturn may encourage policy-makers to consider 'bold' changes in direction, away from the traditional growth logic of capitalist systems of production and consumption to more meaningful sustainable solutions (*ibid*). Often, people are more prone to accept radical changes when the alternative is bleaker than the proposed new situation. For example, during the 1973 oil crisis, motorists were much more conscious of the price of fuel, and leisurely car journeys were undertaken rarely if at all during the petrol shortage (Hall, 1993).

More recently, academic and policy attention has focused on how subtle changes to the way in which consumption decisions are framed can have large impacts on how people react to them (see Chatterton and Wilson, 2014). This work has been popularised recently through Nudge Theory (Thaler and Sunstein, 2008), which advocates the provision of situational cues or choice architecture

to help individuals make better choices in line with their own preferences (as cited in Chatterton and Wilson, 2014). This kind of choice architecture has become very popular in the behaviour change policy arena within the UK and tends to be dominated by social psychological and (behavioural) economics thinking (Central Office of Information, 2009). Some academics question how effective these new policy initiatives are when it comes to reforming long-term patterns of environmental behaviour. Whitehead (2014) argues that perspectives such as Nudge Theory may only be effective over shorter periods and they do not address deeper socio-cultural values which are necessary for effective long-term behaviour change. New policy approaches to behaviour change may create a narrow set of tools for understanding behaviour that are poorly matched to what may be a highly varied and specialised challenge (Chatterton and Wilson, 2014). Pro-environmental behaviour change may not materialise through the use of interventions in isolation (Chatterton and Wilson, 2014). Despite these studies and the emergence of new policy approaches, a significant amount of emphasis is still placed on internal factors (such as an individual's values and psychological factors) on promoting behaviour change.

This paper posits that attempts to understand consumption behaviours by examining individuals as solely autonomous actors are ineffective and that a multi-faceted cross-disciplined approach is needed. There is an urgent need to explore the impact of wider contextual factors and to develop frameworks that clearly emphasise the impact of external, as well as internal factors on consumption behaviour. This is in line with social scientists who advocate the need for more holistic approaches to sustainable consumption in order to provide a more culturally and socially nuanced understanding of pro-environmental behaviours (see Barr, 2008; Ölander and Thøgersen, 2006; Martinsson and Lundqvist, 2010; Stephenson *et al.*, 2015). An in-depth discussion regarding the vast range of factors (both internal and external) that can influence consumption behaviour is beyond the scope of this paper. Instead, discussion is limited to a number of specific factors that potentially influenced consumption behaviour within this sample. Using an adapted version of Barr's framework of environmental behaviours to structure the results, this paper explores the potential influence of three broad groups of variables – environmental concern variables, situational characteristics and psychological factors – on respondents' water, transport and energy behaviour. These factors are discussed further in the results section below.

Methodology

Scope and context

The survey, conducted as part of this study for the CONSENSUS Project, is the first quantitative research design to date that aimed to produce a baseline dataset for three case study locations on the island of Ireland on household consumption attitudes and behaviours (see Lavelle *et al.*, 2012). Drawing from analysis of OECD's reports (2009) and European Action Programmes (EC, 2008), water, transport and energy were identified as priority areas in terms of sustainable

consumption for Ireland. Subsequently, the questionnaire instrument⁴ (containing predominantly pre-coded questions) explored household consumption behaviour and attitudes in areas of water, transport and energy.

The use of a survey tool to collate the data was informed by an extensive review of the international literature on sustainability and environmental behaviours that revealed the widespread use of questionnaire surveys in this field both within and across countries (e.g., DEFRA, 2001; Quist *et al.*, 2001; OECD, 2011; Tudor *et al.*, 2011; National Geographic and Globescan, 2012). For example, the Environmental Policy and Individual Behaviour Change (EPIC) survey explored water use, energy use, personal transport choices, organic food consumption, and waste generation and recycling from over 12,000 households in eleven OECD countries (OECD, 2011) with a survey methodology. The National Geographic and Globescan Survey (entitled ‘Greendex 2012: Consumer Choice and the Environment – A Worldwide Tracking Survey’) measures and monitors consumer behaviours that have an impact on the environment in 65 areas relating to housing, transportation, food, and consumer goods across 17 countries through the use of a survey methodology. Likewise, the Gilded Project – a collaborative research project led by the Potsdam Institute for Climate Impact Research that explored energy consumption patterns and climate change perceptions in five European countries through the use of a survey methodology (Peters, 2010) – achieved its aims through the employment of a survey methodology.

Our current research aimed to facilitate a nuanced investigation of household consumption behaviours on the island of Ireland. Drawing on an adapted version of Barr’s framework of environmental behaviour, the survey was designed to include questions that probed into social and environmental concern variables, situational variables (i.e., structural, socio-demographic and knowledge, awareness and experience) and psychological variables (e.g., self-efficacy, perceptions of environmental responsibility, social norms and social-desirability, and intrinsic motivation) (see Lavelle, 2014). The questionnaire was designed to go beyond reporting on quantitative level data such as frequencies of consumption. Instead the questions contained in the survey probed the underlying rationale behind the undertaking of certain behaviours and consumption choices.

The survey was constructed taking care to minimise biases, as well as to maximise response rates. Factors such as social desirability and other types of conscious or unconscious response bias pose a particular challenge for conducting environmental research. In line with best practice (Bryman, 2008), approximately 25% of questions (four questions in this case) were worded negatively to avoid response-set bias. Negative wording minimises risk of acquiescence set bias, or the tendency for respondents to agree with statements irrespective of their content, which can be a difficulty associated with Likert-like format. In order to overcome

⁴ The questions were constructed with regard to previous surveys, including a number of studies conducted on general attitudes towards the environment in an Irish context (see Drury, 2000; Motherway *et al.*, 2003) and waste in particular (see Fahy, 2005). However, many of these studies are now somewhat dated and explored the Republic of Ireland in isolation.

some of these anticipated difficulties, the professionalism of the interviewer is paramount. The interviewer provided reassurance throughout the survey interview that any information provided would be treated as highly confidential. The provision of accurate interviewer identification, as well as a clear but brief project description facilitates the development of a rapport between the interviewer and the respondent; it also promotes a certain level of trust between the two individuals that helps to overcome certain confidentiality issues associated with administered surveys.

Data collection occurred between June 2010 and April 2011, against the backdrop of an economic downturn and global economic recession, which developed in the later part of 2007. Understanding the context during which the study took place is of crucial importance to the understanding and interpretation of data collated. The survey was conducted during a period of changing, socio-economic and environmental circumstances across the island of Ireland; hence, the economic downturn may have had a potential impact on respondents' self-reported consumption behaviours. Other factors such as the reintroduction of water charges were also highly predominant news features in the media during surveying in Derry/Londonderry and Dublin that may have influenced the responses.

Many of the challenges in the three consumption sectors, water, energy and transport, can be partially linked back to an increase in dwelling size since the mid-1990s, as well as the property boom of the so-called 'Celtic Tiger era' (Davies *et al.*, 2010). The Celtic Tiger era in Ireland (circa the mid-1990s until early 2008) was a period of unprecedented economic growth and development, which saw the economy significantly outperform all other economies in EU (Sweeney, 2008). According to the UNEP (2008), Ireland had the fourth highest GDP per capita in the world during that period. Between 2000 and 2007 in the Republic of Ireland, the annual average growth in real GDP and real GNP was 6% and 5%, respectively (Duffy *et al.*, 2014). The resulting collapse of the construction and banking sectors meant that the Irish economy entered a very deep recession in 2008, during which time (circa. 2008 and 2011) real GDP declined by 5%, while real GNP declined by 10% (Duffy *et al.*, 2014). With the onset of recession, the level and rate of unemployment increased substantially in the Republic of Ireland (*ibid*). In Northern Ireland, the impact of the economic downturn also increased unemployment rates; with 8.2% of the population unemployed in 2012 compared to 7.3% in the same period in 2011 (ONS, 2011).

Rapid changes in economic activity, population levels and settlement patterns during the Celtic Tiger era resulted in a deterioration of environmental quality, as well as increases in greenhouse gas (GHG) emissions⁵. Although the contribution of Northern Ireland and the Republic of Ireland to global (and UK) GHG emissions is small, they are nonetheless significant. This context is important when considering the data gathered in the study.

⁵ For example, ROI's combined emissions between 2008 and 2011 were 1.77 million tonnes above its Kyoto limit (EC, 2013). Northern Ireland's emissions increased 3% in 2010 alone, predominantly due to increased demand for energy for heating. Northern Ireland's emissions of methane and nitrous oxide both exceed 7% of the total UK figure (DOENI, 2011).

Sampling and procedure

A multi-stage cluster sampling technique was utilised to select three specific counties for the sampling frame; Galway, Derry/Londonderry and Dublin. These three case study locations (i.e., primary clusters) were selected to generate comparative data, but also as stand-alone case study areas in their own right. Located on one of Europe's most peripheral regions (i.e., the west coast of Ireland), County Galway was selected as a primary cluster based on its geographic location and also its socio-demographic characteristics⁶. Galway city has a population of 72,414 people and is surrounded by a large hinterland with a population of 222,940 people (CSO, 2006). Galway also has a rapidly expanding young population, and this dynamic growth rate is reflected in its age profile. It is reported that approximately half of Galway's population are less than 24 years of age (CSO, 2011). Galway has been called the 'gateway to the west' as it acts as a nodal centre for the surrounding county (Collins and Fahy, 2010). County Galway is quite rural in composition; with 15% of the population living in aggregated town areas and the other 85% residing in the aggregate rural areas. Many of these people residing in rural hinterlands commute to work in Galway city.

In order to enable a comparative cross-border analysis of consumption behaviours, County Derry/Londonderry was selected as a primary cluster from the six counties in Northern Ireland. Derry/Londonderry is similar to County Galway in that both counties are comprised of large urban areas with large rural hinterlands surrounding them. The population of the Derry/Londonderry City Council area is currently 107,877 persons accounting for 5.96% of the Northern Ireland total (NISRA, 2011). The city's population is comparatively young; with 24,214 (22%) of the population under 16 years of age (NISRA, 2011). Just over 71% of the population are aged less than 50 years of age while 22% of population are aged under 16 years and 12% were aged 65 and over. The mean age of the population is 35 years (*ibid*). County Derry/Londonderry was slightly different in comparison to the Republic of Ireland's sample areas as the county itself is governed according to a number of Local Government District Councils⁷ (LGDCs), as opposed to Electoral Districts (EDs) in the Republic. County Derry/Londonderry's urban sampling frame was selected from within Derry/Londonderry Urban Area's jurisdiction.

County Dublin was selected as the final primary cluster, due to its position as capital city of the Republic of Ireland as well as its socio-demographic characteristics. With its 1.5 million population (CSO, 2011), Dublin City Council is the largest local authority in Ireland and has many similarities with other European cities; in terms of similar population levels, transportation links and urban sprawl. However, despite the many similarities, Dublin tends to be omitted from larger international studies on sustainability and environmental research (see

⁶ At the time of survey design, the most recent national census of the population was based on 2006 data (Central Statistics Office, 2006).

⁷ Four Local Government District Councils (LGDCs) comprise the county: Derry/Londonderry District Council, Limavady District Council, Coleraine District Council and Strabane District Council. These four LGDCs comprise Derry's rural sampling frame.

Lavelle and Fahy, 2014 for detailed discussion). In relation to Dublin's 'rural' sampling frame, Fingal County Council was selected due to its territory being still quite rural in character, compared to the other Dublin council areas (e.g., Dun Laoghaire-Rathdown and South Dublin). Fingal comprises 5.6% of the total national population and has a population of 239,992 persons (CSO, 2006). Fingal is Ireland's youngest county; with the average age of its resident being 32 years old (the national average of 36 years). Fingal also has a high proportion of young families (CSO, 2006).

In terms of secondary clusters, thirty EDs⁸ were then selected for sampling in these three counties based on their varying socio-demographic characteristics, as well as their varying geographical locations. A total of ten EDs were chosen from each of the three counties. A proportionate sample was then drawn up based on the varying population numbers in each of these selected electoral districts. Using a stratified random sample, a total of 1,500 domestic households were surveyed across these thirty electoral districts. Table 1 gives a summary of the multi-stage cluster sampling method. The characteristics of the sample surveyed are outlined in Table 2.

Regarding the surveying procedure, the adult who answered the door was recruited to participate in an administered survey. This method could result in the oversampling of multi-person households. The use of the sampling lists aimed to counteract this bias. To avoid selecting household addresses in a disproportionate probability basis, the national address database, Geodirectory was utilised. This meant that larger households were not over-represented. This is in contrast to the electoral register, which was utilised in previous Irish studies (see Motherway *et al.*, 2003). The employment of the electoral register meant that larger households (i.e., households that contained more electors) had a higher probability of being selected than addresses which contained a lower number of electors. Only persons over the age of 18 years of age were permitted to partake in this survey. Informed consent⁹ was obtained before participation occurred.

The data were collected through the use of a tablet computer, which utilised an Access interface. A coding system was designed for each question using an Excel spreadsheet to facilitate exportation directly from the Access interface onto a corresponding Statistical Packaging Software – 'Statistical Package for the Social Sciences' (SPSS) – for analysis. Analysis of the dataset occurred over a number of stages. The findings presented in this paper¹⁰ are the results of statistical analysis which involved a combination of frequency tables and cross-tabulations employed to explore the emerging trends in reported behaviours and expressed attitudes.

⁸ Electoral districts are the lowest geographic unit of measurement for which the Census of Population data is provided to the public by the Central Statistics Office (CSO, 2006).

⁹ The CONSENSUS Project (Davies *et al.*, 2014) was granted full approval by the NUI, Galway Research Ethics Committee on 14 April 2009

¹⁰ All frequencies reported in this study are expressed as percentages, which have been rounded to the nearest whole number for this paper.

Table 1: Example of clusters used in multi-stage clustering sample

Primary Clusters	Secondary Clusters	Tertiary Clusters
Galway	10 Electoral Districts	500 Households
Derry/Londonderry	10 Electoral Districts	500 Households
Dublin	10 Electoral Districts	500 Households

Table 2: Summary of sample profile

	Frequency	Percentages
Gender		
Female	878	59
Male	622	41
Age Categories		
18-33	395	27
34-49	529	36
50-64	363	25
65-79	144	10
80+	21	2
Education		
No formal education/ primary education only	66	5
Second level education	613	41
Third level education	813	54
Housing Tenure status		
Own house without a mortgage	547	37
Own house with a mortgage	527	35
Tenant – paying rent to private landlord	259	18
Tenant – paying rent social/voluntary/municipal housing body	37	3
Accommodation is provided rent free	43	3
Other	63	4
Number of Residents		
Lived alone	131	8
Two-Person Household	429	29
Three-Person Household	335	22
Four-Person Household	356	24
Five-Person Household	205	14
Six+-Person Household	38	3
Household composition		
Family members	898	60
Live alone	124	8
Housemates	104	7
Other	19	1
Spouse or partner	337	23
Owner occupied	6	1
Income categories		
Euro Income Categories (N= 683)		
<€37,999	268	39
€38,000-€113,999	398	58
>€114,000	17	3
Sterling Income Categories (N=382)		
< £26,392	137	36
£26,393 – £79,178	232	61
>£79,179	13	3

Potential limitations of the methodology

The research design and methods employed in this study are not without their limitations. The researchers were conscious of several challenges involving the use of survey methods, and in particular an administered survey instrument, when exploring attitudes and behavioural change. Researchers such as Blake (1999) and Hobson (2003) feel that the use of quantitative methods in the study of human behaviour is overly deterministic. The administered nature of this methodological design also raises issues of anonymity and confidentiality, which could deter respondents from participating in the study or promote reluctance to divulge personal information (i.e., age or income levels) to the interviewer (Ong and Weiss, 2000). This study relied on self-reported data, which are susceptible to numerous biases such as recall bias, confidence bias and/or social desirability bias, which may limit the interpretation and generalisation of the study's findings (Corral-Verdugo, 1997). Although self-report measures utilised on surveys often provide a pragmatic and cost-effective way to measure pro-environmental behaviours (Fahy and Rau, 2013), researchers who attempt to measure and report pro-environmental behaviours through the use of reported behavioural indices on survey instruments must be cautious of inaccurate reporting of 'actual behaviours' (Barr and Prillwitz, 2013; Gatersleben *et al.*, 2002; Viklund, 2004). Hence, while acknowledging the potential drawbacks, it is important nevertheless to recognise the significance of large data sets for critically inspired, progressively orientated research agendas (Fahy and Rau, 2013).

Results

This section summarises baseline trends and patterns in respondents' reported household consumption behaviours in relation to water, transport and energy consumption across three areas on the island of Ireland, and explores the potential influence of three broad groups of variables: environmental concern variables, situational characteristics, and psychological factors. The first results section focuses on key trends in trends of environmental concern, self-efficacy, responsibility and awareness. The second section reports on trends on water consumption and water conservation actions. The next section explores emerging trends and patterns in relation to transport. Finally, the fourth section explores attitudes and behaviours concerning energy consumption.

Baseline trends of environmental concern, self-efficacy, responsibility and awareness

This study found high levels of reported environmental concern; with 86% of respondents (n=1,289) stating that they were either 'very concerned' or 'somewhat concerned' about environmental issues¹¹. Similar levels of environmental concern

¹¹ The study examined respondents' reported level of concern for the environment through one statement on the CONSENSUS Lifestyle Survey instrument: Which one of the following statements best describes how you feel about environmental issues? Respondents were asked to answer this question using a four-point Likert-like scales that ranged from 'very concerned' to 'not at all concerned'.

were recorded across all age cohorts, with slightly higher levels of concern noted amongst respondents in the 50-64 age category and the 65-79 age group (both 88% respectively), compared to respondents in the 18-33 age category (83%), the 34-49 age category (85.6%) and the 80+ age category (81%). More female respondents (27%, n=240) reported being 'very concerned' in comparison to male respondents (17%, n=108). Levels of environmental concern were also slightly higher among respondents who had attained third level education (89%), in comparison to respondents who had completed their education at the primary level (82%) or secondary level (83%).

High levels of self-efficacy beliefs were also noted; with 82% of respondents (n=1,129) believing that their personal behaviour could make a difference to the environment. Furthermore, 58% felt that they needed 'to behave in a more environmentally friendly way'. Results also revealed that over two thirds of respondents (69%, n=1,028) wanted to be perceived by others as being environmentally friendly¹².

From an environmental sustainability perspective, these findings are quite positive. Studies have found environmental concern to be positively related – although relationships tend to be weak – to pro-environmental behaviour (Stern, 2000; De Groot and Steg, 2009). Research emerging on individual responsibility also finds that individuals who experience personal responsibility for the environment may be more likely to act in a pro-environmental manner. Intrinsic motivation is another key driver for environmental action. Notions of self-efficacy, or a person's perceived behavioural control, are intrinsically linked to issues of environmental responsibility (Vining and Ebreo, 1992; Dobson, 2006). Despite these relatively positive attitudes, there was strong evidence in the results of the existence of value-action gaps in the areas of water, energy and transport behaviours.

Expressed attitudes and reported behaviours across key household consumption sectors:

Water

High levels of awareness of the need to conserve water were found in the total sample, with 80% of respondents (n=1,198) in agreement with the statement: 'There is a need to save water'. More than half of respondents believed that they do not have a right to use as much water and energy as they wished in their homes. A statistically significance difference was noted at the 0.05 significance level for men and women in the sample, and their sense of entitlement to unlimited water and energy use $\{\chi^2(4)=10.560, p=0.032\}$. More women (56%), compared to men (53%), reported not having the right to use as much water and energy as they wish.

Respondents' water usage behaviours¹³ did not reflect these expressed pro-environmental beliefs concerning the need for water conservation and lack

¹² The CONSENSUS Lifestyle Survey employed one statement to measure respondents' desire for social acceptance: 'I like people to think of me as being environmentally friendly'.

¹³ These water findings may not adequately reflect the overall water usage in a household as one individual is asked to report on the water usage of the entire household. Numerous biases such as recall bias or lack of accurate knowledge of other household members' water usage means that these findings may not give a true representation of total water usage in the house.

of water entitlement. Although 51% of respondents ($n=764$) agreed with the statement: 'I already save as much water as I can in my home', another 40% of respondents ($n=597$) stated that they 'do not pay attention to the amount of water they use in their homes'. Over one third of respondents (37%, $n=558$) felt entitled to use unrestricted amounts of resources and concurred with the statement: 'I have the right to use as much water and energy as I wish'. The relationship between environmental concern and respondents' reported water conservation behaviours was also investigated. Reported water conservation behaviours were examined by agreement with the statement: 'I pay attention to the amount of water I use in the home'. Results indicated a weak positive relationship between participants' level of environmental concern and their reported water conservation behaviours. The greater the level of environmental concern reported the greater the likelihood that the respondent paid attention to the amount of water used. Although a weak positive relationship was found to exist between these two variables {Spearman's $\rho=0.192$, $p < 0.01$ }, this finding nevertheless supports previous research findings that show a positive link between pro-environmental attitudes and commitment to water conservation (Nancarrow *et al.*, 1996; Willis *et al.*, 2011).

It is important to note that customers in the Republic of Ireland only perceived their consumption behaviour, as their water was not metered at the time of the study. Both Northern Ireland and the Republic of Ireland are two of the very few regions in Europe, and other developed countries across the world, without domestic water charges at the current time. In Northern Ireland, households are metered yet all domestic water charges are met by a government subsidy so there is no direct charge to the consumer. As a result, there is a notable lack of information on water consumption levels across the island due to the low levels of water metering that followed the removal of water charges for domestic usage in 1997 in the Republic. Water charges and metering were to be reintroduced for all domestic houses, under new budgetary guidelines, across the Republic of Ireland in 2015. However, the reintroduction and subsequent suspension on July 1st, 2016 of domestic water charges is a matter of ongoing public interest and policy debate.

In terms of situational variables, socio-demographic variables were found to influence respondents' expressed attitudes and behaviours concerning water. A statistically significant difference was found to exist between the different genders and their reported awareness of water use $\{\chi^2 (1, N=1,497) = 26.137, p=0.00\}$. Results found that women tended to have greater awareness of their water usage compared to male respondents, with 62% of female respondents stating that they paid attention to water use in their homes compared to 49% of male respondents. Water conservation behaviours also varied across the various age categories, with respondents in the older age cohorts being more likely to pay attention to the amount of water they used in their homes. For example, 74% of respondents in the 66+ years of age cohort, 64% of the 41-65 age category and 44% of the 18-40 age cohort stated that they paid attention to the amount of water they used. This difference was found to be statistically significant at the 0.01 significance level $\{\chi^2 (4) = 68.293, p=0.00\}$. A statistically significant association was also

noted between various age cohorts and conserving water status $\{\chi^2(4) = 66.398, p = 0.00\}$. A greater number of respondents in the older age cohorts agreed with the statement: 'I already save as much water as I can'. For example, 76% of respondents in the 66+ years of age category, 54% of the 41-65 age category and 42% of the 18-40 age cohort declared that they currently conserve as much water as possible.

Structural variables also appeared to have an impact on water consumption; with 68% of respondents stating that the reintroduction of a water charge would change their water usage. Respondents in the middle-income cohorts were most likely to agree that water charges would change their water behaviour, as opposed to respondents in the highest and lowest income brackets. No statistically significant difference was found between respondents across the different income cohorts regarding their (dis)agreement with the question: 'Would the reintroduction of a water charge change your water usage?'

Psychological variables, such as social norms and self-entitlement beliefs were examined. For this study, the reduction in water use and its associated connotations with being unhygienic was considered as a social norm. This is in line with Shove's (2003) work that reported how a range of actors are pressuring the expectations of comfort and cleanliness placed upon each individual through daily showering. Results of this study found that 27% of the respondents ($n=410$) agreed that 'using less water would be unhygienic'. There was little variance across the genders and agreement with this social norm, with 27% of male respondents and 28% of female respondents concurring with this statement. Respondents in the younger age categories, in comparison to respondents in the older age cohorts, were more likely to state that 'using less water would be unhygienic'. Perhaps this finding is reflective of differentiated notions of cleanliness and personal hygiene in previous times (Doyle, 2013; Doyle and Davies, 2014; Shove, 2003). Entitlement beliefs seemed to play a role in water conservation behaviours. Using Spearman's rho correlation coefficients, a fair degree of association was detected between participants' agreement with the statement that they need to conserve water in their homes and that they should be entitled to use as much water and energy as they wish $\{\text{Spearman's } \rho = -0.421, P < 0.01\}$. This negative relationship showed that the more a person agreed with the statement that they should save water; the less they agreed with the statement that they should be entitled to use as much water and energy as they wish. In contrast, a weak positive correlation existed between respondents who paid attention to the amount of water they used in their homes and whether or not individuals felt they already saved as much water as they could in their homes $\{\text{Spearman's } \rho = 0.291, P < 0.01\}$.

The next section explores findings on reported transport behaviour across three sample areas on the island of Ireland.

Transport

Transport represents a key challenge to sustainability and the island of Ireland is one of the most car-dependent societies in Europe¹⁴ (Rau and Vega, 2012; Rau, 2014). The significance of private car use was identified in the survey data, with 71% of respondents who reported commuting to work, school or college stating that they usually drove a car. This result compares favourably with Republic of Ireland census results, which show that 73% commuters drive a car or van (CSO, 2012). Walking represented the second most common mode of transport (9%, n=95). Cycling was the third most popular mode of transport (8%, n=80). The corresponding figure in the Irish census is 22% (CSO, 2012). Overall, the combined number of respondents who reported using more pro-environmental methods of transportation to reach their place of employment or study was substantially less than the number of individuals who commute by car, with less than one quarter of all respondents (24%) stating that they cycled, walked or used public transport. Regarding the distance travelled to work, school and college, the most frequent response was ‘less than 10 miles¹⁵’. A total of 47% of commuters (n=485) reported commuting distances of ‘less than 5 miles’. Another 18% of respondents (n=185) stated that they travelled less than two miles to their place of employment or study, a distance that can be covered relatively easily by cycling or walking.

Socio-demographic factors can influence people’s commuting behaviour, particularly regarding their mode of transport and distance travelled. Structural issues, such as services and the built environment, can promote or hinder the uptake of pro-environmental transport behaviours (see Manton *et al.*, 2016). A perception of a lack of public transport services was highlighted in the data, with 35% of respondents stating that there was no public transport available for their commute to work, school or college (n=359). This is in line with previous research carried out by the Urban Institute Ireland (2001) that highlighted a lack of public transport, isolation and distance from facilities as a key limitation to rural life for people in Ireland. Respondents who did not make use of available public transport viewed it as ‘too restrictive’ (42%, n=272), ‘too unreliable’ (11%, n=70) and ‘too expensive’ (7%). The most common response to why people did not use public transport for their commute to work, school or college across the three sample areas was that it was ‘too restrictive’. Respondents can be potentially locked into unsustainable mobility patterns due to other structural contexts such as their work duties; with 17% of respondents (n=108) stating that they require their car or van ‘for my job’.

¹⁴ For more in-depth discussion on transport and the consumption of distance, please see Davies *et al.*, 2014.

¹⁵ One mile equates to 1.609 kilometres.

Respondents were also questioned on their willingness to reduce their car use in order to protect the environment. Results indicate that 44% of respondents interviewed would be willing to reduce their car usage. When asked what would encourage a reduction in car journeys, 53% of the sample (n=792) stated 'improved, more affordable public transport', 12% of respondents (n=18) reported 'financial incentives to encourage walking and cycling' and a further 12% of respondents (n=181) cited 'improved bike lanes, footpaths and pedestrian crossings'. The results of this study indicate that financial concerns appear to be at the forefront of many respondents' rationale for not reducing their car usage. This finding is broadly in line with other studies, including those that demonstrate a strong link between personal transport decisions and cost (OECD, 2007) and socio-economic status and modal choice (Rau and Vega, 2012). Also, these findings reflect a report by the OECD (2013), which suggests that 'improved public transport' and 'investment in public transport' would reduce car dependency. The final results section explores findings on reported energy behaviour.

Energy

Irish homes account for approximately one quarter of total energy used nationally (SEAI, 2012). Results of the CONSENSUS Lifestyle Survey found that over half of the respondents (53%) had not reduced their household energy consumption in the past month for environmental reasons. There was little variation noted between men and women in terms of reducing their energy use, with 46% of female respondents having done so, in comparison to 44% of male respondents. Older respondents tended to be the most active energy reducers, with 61% of the 65-79 age groups reporting that they had reduced their energy use in the past month for environmental reasons, in comparison to 49% of the 50-64 age cohort and 43% of the 34-49 age groups. The majority of respondents stated that they would be prepared 'to buy more energy-efficient appliances' (91%, n=1,365). Willingness to purchase energy-efficient appliances was consistently high for both male and female respondents (90% of men and 92% of women). Willingness to purchase energy-efficient appliances was also high for respondents across all age cohorts.

Psychological factors appear to play a role in influencing people's energy behaviour. For example, respondents' willingness to change social norms about individuality and ownership of goods emerged, with over half of the sample (54%) stating that they would not be willing to share appliances with neighbours. Results found that changing lifestyles to incorporate sharing or communal appliances was not viewed as popular.

Over one fifth of respondents (21%) had reportedly changed to a renewable energy supplier in the past five years. Economic reasons were cited as the primary reason for changing behaviour, with 65% of respondents who changed supplier stating 'financial reasons' and 9% reported 'solely environmental reasons' as their rationale for this behaviour. Although literature finds that adopters of 'green' electricity tend to be highly influenced by information from friends, family and newspapers rather than top-down government sources (Briceno and Stagl, 2006),

it was interesting to note that only 3% of respondents stated that they changed to a renewable energy supplier because they were 'recommended by family and friends'.

Discussion

The results outlined in this paper provide empirical data identifying expressed attitudes and reported behaviours in the areas of water, transport and energy consumption in three case study locations across the island of Ireland. Overall, the findings paint a picture of an environmentally aware and environmentally concerned group of respondents. As reviewed earlier in this paper, it is evident from previous literature that high levels of environmental awareness or the willingness to contribute to environmental solutions do not always provide a sufficient foundation for pro-environmental behaviour. Environmental behaviours show unpredictable patterns, despite good intentions and strong pro-environmental values.

The results of this study reveal the persistence of value-action gaps, with relatively poor uptake of sustainable consumption behaviours in the areas of water, energy and transport. For example, when the reported data on energy consumption were analysed, although 73% of respondents stated that they would be willing to install insulation in their homes for environmental reasons, less than one quarter of respondents (23%) had actually done so in the previous five years.

Adopting a framework approach to structure the analysis of possible drivers and barriers of consumption behaviours proved useful in this context. These results indicate that attention needs to be given to a wide range of factors such as environmental concern variables, situational variables and psychological factors.

Socio-demographics were found to be important, particularly for the adoption of water-saving actions. There was a distinct gender divide in reported water use, with women reporting greater levels of awareness of their water use. Respondents' commuting patterns also appeared to be influenced by socio-economic characteristics such as gender; with more men reporting driving for their work, school or college commute than women. These results echo recent research that shows significant gender differences in consumption behaviour (see OECD, 2013).

Psychological variables also played a key role in influencing consumption behaviours across water, transport and energy sectors. Issues like subjective norms and social influences were found to be important drivers of environmental actions. For example, social norms related to the use of water for hygiene purposes were apparent in the data, with over one quarter of the respondents agreeing with the statement 'using less water would be unhygienic'. This belief was more apparent in the younger age categories, in comparison to respondents in the older age cohorts. This is perhaps reflective of changing notions of cleanliness and personal hygiene in society (see Doyle and Davies, 2014).

The results highlight the importance of external structural variables for shaping transport behaviours. In particular, the need for adequate infrastructure, the role of

financial constraints and the importance of affordability of public transport were identified as important variables. The results suggest that there is broad support for additional government investment in public transportation infrastructure. A prevailing lack of available transport services illustrates how respondents are potentially locked-into unsustainable patterns of mobility.

The results of this research could be utilised to support a call for more policies based on the use of environmental levies and taxes to encourage changes to consumption and lifestyle behaviours. Analysis of CONSENSUS data indicated that volumetric water charges and higher water prices may increase the uptake of adopting water conservation activities; with over two thirds of respondents stating that the reintroduction of a water charge¹⁶ would change their water consumption behaviour. Financial motivation was found to be a key driving factor for respondents' changing to a renewable energy supplier. However, as discussed earlier in this paper, caution should be exercised when relying predominantly on external factors to impact behavioural change as many consumers may revert to their original behaviour once the context changes (e.g., once taxes and levies are removed), regardless of the environmental impact of that behaviour. A review by Guagnano *et al.*, (1995) noted that prolonged environmental behaviour change required intrinsic motivation. Furthermore, the possible social implications of introducing economic measures cannot be ignored. Therefore, over-confidence in the use of economic measures alone (e.g., water charges and metering) to change consumer consumption behaviours may be wrongly placed.

Environmental actions do not occur in a social vacuum. A range of barriers and structures exist which both facilitate and impede individual consumption behaviour. This explains the identification of a value-action gap in these data and the challenge posed by this gap for meaningful long-term consumption behaviour change. Supportive structural variables are required across different governmental sectors (such as economic, educational, and transport) to promote pro-environmental behaviours. Studies that examine only psychological variables fail to incorporate the importance of socio-demographic and structural variables. Similarly, studies that examine only situational or contextual variables fail to understand a person's capabilities and personality traits as well as their beliefs. Hence, single variable studies may not contribute to a comprehensive understanding of particular environmentally significant behaviours, which is needed to change them. Rather, a multi-faceted policy approach, involving a mix of policy tools, is required for a shift towards sustainable consumption behaviours.

The need for a radical shift in thinking about consumption and economic growth has been demonstrated in recent work by social scientists in Ireland (Edmondson and Rau, 2008; Kirby and Murphy, 2011). However, the notion of a no-growth or even a de-growth economy remains unpalatable to many. Unless national governments embrace and promote radical innovations for thinking

¹⁶ Data were gathered from 2010 to 2011, which was a period where the reintroduction of water charges and metering was discussed widely in the Republic of Ireland.

about consumption differently, policy debates about the merits of meaningful behavioural change will remain in the fringes of mainstream policy decision-making as a desirable, but ultimately, unattainable objective. Although sustainable consumption policy may still be in its formative stages, Ireland is currently gaining momentum with regards to its sustainable consumption data and research direction. Indeed, the data reported on in this paper address the distinct knowledge gap in this regard for the island of Ireland, feeding into the growing body of international research focused on understanding sustainable consumption.

The results of the survey posit that although a greater commitment to pro-environmental behaviours is required on the part of individuals, so too is increased attention from government and businesses to wider structural, societal and political factors that can inhibit individuals' sustainable consumption choices. Finally, this paper highlights that the timing of an economic recession and its impacts across the island had the potential for creating a radical shift in consumption behaviour. As discussed previously, this potential to shift policy from traditional growth logic of capitalist systems of production and consumption to more meaningful sustainable solutions has yet to be measured and evaluated especially in the context of long-term, meaningful change.

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References

- Barr, S. (2002) *Household Waste in Social Perspective*. UK: Ashgate Publishing Limited.
- Barr, S. (2008) *Environment and Society: Sustainability, Policy and the Citizen*. Aldershot, Hampshire: Ashgate Publishing Limited.
- Barr, S., Gilg, A. and Shaw, G. (2011) Citizens, consumers and sustainability: (re)framing environmental practice in an age of climate change, *Global Environmental Change*, 21, 1224-1233.
- Barr, S. and Prillwitz, J. (2013) Household analysis: researching ‘green’ lifestyles, a survey approach. In: F. Fahy, and H. Rau (eds.) *Methods of Sustainability Research in the Social Sciences*. Sage Publications: London.
- Blake, J. (1999) Overcoming the value action gap in environmental policy; tensions between the national policy and local experience, *Local Environment*; 4, 257-78.
- Briceno, T. and Stagl, S. (2006) The role of social processes for sustainable consumption, *Journal of Cleaner Production*, 14(17), 1541-1551.
- Bryman, A. (2008) *Social Research Methods*. Oxford: Oxford University Press.
- Chatterton, T. and Wilson, C. (2014) The ‘four dimensions of behaviour’ framework: a tool for characterising behaviours to help design better interventions, *Transportation Planning and Technology*, 37(1), 38-61.
- Collins, P. and Fahy, F. (2010) Culture and creativity: a case study from the west of Ireland. *Centre for Innovation and Structural Change (CISC): Working paper 31*.
- Corral-Verdugo, V. (1997) Dual “realities” of conservation behavior: self-reports versus observations of reuse and recycling behavior, *Journal of Environmental Psychology*, 17, 135-146.
- Central Office of Information (COI) (2009) *Communications and behaviour change*. Central Office of Information, Government Communications Network: EU.
- Central Statistics Office (2006) *Census data 2006*. Central Statistics Office: Dublin.
- Central Statistics Office (2011) *Census data 2011*. Central Statistics Office: Dublin.
- Central Statistics Office (CSO) (2012) *Census 2011, Profile 10*. Cork, Ireland.
- Davies, A., Fahy, F., Rau, H. and Pape, J. (2010) Sustainable consumption and governance: reflecting on a research agenda for Ireland, *Irish Geography*, 43(1), 59-79. DOI: 10.1080/00750771003732664.

- Davies, A., Fahy, F. and Rau, H. (eds.) (2014) *Challenging Consumption: Pathways to a More Sustainable Future*. Routledge: London.
- DEFRA (Department for Environment, Food, and Rural Affairs) (2001) *Survey of public attitudes to quality of life and to the environment*. DEFRA: UK. Available at: www.defra.gov.uk/environment/statistics/pubatt/content.htm. (Accessed 16 November 2011).
- De Groot, J.I.M. and Steg, L. (2009) Mean or green: which values can promote stable pro-environmental behaviour? *Conservation Letters*, 2(2), 61-66.
- Dobson, A. (2006) Thick Cosmopolitanism, *Political Studies*, 54, 165-184. Doi: 10.1111/j.1467-9248.2006.00571.
- DOENI (Department of the Environment Northern Ireland) (2011) *Northern Ireland Greenhouse Gas Emissions Reduction. Cross – Departmental Working Group on Greenhouse Gas Emissions*. February 2011. Northern Ireland: DOENI and Northern Ireland National Sustainable Development Strategy.
- Doyle, R. and Davies, A. (2014) Surface tension: the challenges of water consumption. In: A.R. Davies, F. Fahy, and H. Rau (eds.) *Challenging Consumption: Pathways to a More Sustainable Future* (135-157). Routledge: London.
- Doyle, R. and Davies, A. (2013) Towards sustainable household consumption: Exploring practice-oriented, participatory backcasting approach for sustainable heating practices in Irish households, *Journal of Cleaner Production*, 48, 260-271.
- Drury Research Study (2000) *Attitudes and actions: a national survey on the environment*. Dublin: DOEHLG.
- Duffy, D., FitzGerald, J., Timoney, K. and Byrne, D. (2014) *Quarterly economic commentary*. Dublin: Economic and Social Research Institute (ERSI).
- Edmondson, R. and Rau, H. (eds) (2008) *Environmental Argument and Cultural Difference: Locations, Fractures and Deliberations*. Oxford: Peter Lang.
- EC (2008) *Progress on EU Sustainable Development Strategy*. Brussels: European Commission.
- EC (2013) *Emissions trading: 2013 data show lower emissions but surplus of allowances persists*. Press release: European Commission. Available at: http://europa.eu/rapid/press-release_IP-14-561_en.htm.
- Fahy, F. (2005) The right to refuse, *Local Environment*, 10, 551-69.
- Fahy, F. and Rau, H. (eds.) (2013) *Methods of Sustainability Research in the Social Sciences*. Sage Publications: London.
- Fahy, F., Doyle, R., Rau, H., Davies, A.R. and Pape, J. (2014) In: A.R. Davies, F. Fahy, and H. Rau (eds.) 2014 *Challenging Consumption: Pathways to a More Sustainable Future* (19-35) Routledge: London.

- Fishbein, M. and Ajzen, I. (1975) *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.
- Gatersleben, B.C.M., Steg, L. and Vlek, C. (2002) Measurement and determinants of environmentally significant consumer behavior, *Environment and Behavior*, 34(3), 335-362.
- Gatersleben, B.C.M., Murtagh, N. and Abrahamse, W. (2012) Values, identity and pro-environmental behavior, *Contemporary Social Science: Journal of the Academy of Social Sciences*, 1-19.
- Guagnano, G.A., Stern, P.C. and Dietz, T. (1995) 'Influences of attitude-behavior relationships: a natural experiment with curbside recycling', *Environment and Behavior*, 27(5), 699-718.
- Hall, P.A. (1993) Policy Paradigms, Social Learning, and the State: The Case of Economic Policymaking in Britain, *Comparative Politics*, 25(3), 275-296.
- Hines, J., Hungerford, H. and Tomera, A. (1986) Analysis and synthesis of research on environmental behavior: A meta-analysis, *Journal of Environmental Education*, 18(2), 1-8.
- Hinton, E. and Goodman, M.K. (2010) Sustainable consumption: developments, considerations and new directions. In: M. Redclift and G. Woodgate (eds.) *International Handbook of Environmental Sociology* (2nd ed). Cheltenham: Edward Elgar Publishing.
- Hobson, K. (2003) Thinking habits into action: the role of knowledge and process in questioning household consumption practices, *Local Environment*, 8(1), 95-112.
- Jackson, T. (2005) *Motivating Sustainable Consumption: a review of evidence on consumer behaviour and behavioural change*. London: Sustainable Development Research Network. Available at: http://www.sd-research.org.uk/wp-content/uploads/motivatingfinal_000.pdf.
- Jackson, T. (2009) *Prosperity without Growth – Economics for a Finite Planet*. London: Earthscan.
- Kirby, P. and Murphy, M. (2011) *Towards a Second Republic – Irish Politics after the Celtic Tiger*. Pluto Press: London.
- Lavelle, M.J. and Fahy, F. (2012) *Consensus Lifestyle Survey – Report on public attitudes and behaviours towards sustainable consumption and sustainable lifestyles in Ireland: (1) Methodology and profiling*. National University of Ireland, Galway.
- Lavelle, M.J. and Fahy, F. (2014) Unpacking the challenges of researching sustainable consumption and lifestyles. In: A. Davies, F. Fahy and H. Rau (eds.) *Challenging Consumption: Pathways to a More Sustainable Future* (36-64). Routledge: London.

- Lavelle, M.J. (2014) *Towards Sustainability: Household consumption and lifestyles in the Republic of Ireland and Northern Ireland*. Unpublished thesis. National University of Ireland, Galway.
- Lavelle, M.J., Rau, H. and Fahy, F. (2015) Different shades of green? Unpacking habitual and occasional pro-environmental behaviour, *Global Environmental Change*, 35, 368378.
- Manton, R., Rau, H., Fahy, F., Sheahan, J. and Clifford, E. (2016). Using mental mapping to unpack perceived cycling safety. *Accident Analysis and Prevention*, 88, 138-149.
- Martinsson, J. and Lundqvist, L.J. (2010) Ecological Citizenship: Coming out 'Clean' without turning 'Green'?, *Environmental Politics*, 19(4), 518-537.
- Michaelis, L. and Lorek, Sylvia. (2004) Consumption and the Environment in Europe: Trends and Future. Environmental Project no. 904. Copenhagen: Danish Environmental Protection Agency.
- Motherway, B., Kelly, M., Faughnan, P. and Tovey, H. (2003) *Trends in Irish Environmental Attitudes between 1993 and 2002*. First Report of National Survey Data by the Research Programme on Environmental Attitudes, Values and Behaviour in Ireland. Dublin: Social Science Research Centre, University College Dublin.
- Nancarrow, B.E., Smith, L.M., Syme, G.J. (1996-1997) The ways people think about water, *Journal of Environmental Systems* 25, 15-27.
- National Geographic and GlobeScan and Greendex (2012) *Consumer Choice and the Environment – A Worldwide Tracking Survey*. Toronto: Globescan. Available at: <http://environment.nationalgeographic.com/environment/greendex/>. (Accessed 10 September 2012).
- Northern Ireland Statistics and Research Agency (NISRA) (2011) *National Census*. NISRA, Census Office: Belfast.
- Ó Gallachóir, B., Keane, B.P., Morrissey, E. and O'Donnell, J. (2007) Using indicators to profile energy consumption and to inform energy policy in a university – a case study in Ireland, *Energy and Buildings* 39, 913-922.
- OECD (2007) *Managing Urban Traffic Congestion*. European Conference of Ministers of Transport. Organisation for Economic Co-Operation and Development: Paris.
- OECD (2009) *Ireland's environmental performance*. OECD: Paris.
- OECD (2011) *Greening household behaviour: The role of public policy*. OECD Publishing: Paris.

- OECD (2013) *Greening household behaviour: Overview from the 2011 survey*: OECD Studies on *Environmental Policy and Household behaviour*. OECD Publishing: Paris. Available at: <http://dx.doi.org/10.1787/9789264181373-en>. Gallup Organisation at the request of the Directorate-General for the environment.
- Office for National Statistics (ONS) (2011) *General Household Survey*. United Kingdom: UK Statistics Authority.
- Ölander, F. and Thøgersen, J. (2006) The A-B-C of Recycling, *Advances in Consumer Research*, 7, 297-302.
- Ong, A. D., and Weiss, D. J. (2000) The impact of anonymity on responses to 'sensitive' questions, *Journal of Applied Psychology*, 30, 1691-1708.
- Peters, V. (2010) *Energy consumption patterns and climate change perception in five European countries*. Potsdam Institute for Climate Impact Research: EU.
- Quist, J., Knot, M., Young, W., Green, K. and Vergragt, P. (2001) Strategies towards sustainable households using stakeholder workshops and scenarios, *International Journal of Sustainable Development*, 4(1), 75-89.
- Rau, H. and Vega, M. (2012) Spatial (Im)mobility and Accessibility in Ireland: Implications for Transport Policy, *Growth and Change*, 43(4), 667-697.
- Rau, H. (2014) Part II: Moving – Section introduction and summary. In: A. Davies, F. Fahy, and H. Rau (eds.) *Challenging Consumption: Pathways to a More Sustainable Future* 9, (57-61/99-101). Routledge: London.
- Sanne, C. (2002) Willing consumers – or locked-in? Policies for a sustainable consumption. *Ecological Economics* 42, 273-287.
- Scholl, G., Rubik, F., Kalimo, H., Biedenkopf, K. and Söbech, O. (2010) Policies to promote sustainable consumption: Innovative approaches in Europe, *Natural Resources Forum* 34, 39-50.
- Shove, E. (2003) *Comfort, Cleanliness and Convenience: The Social Organization of Normality*. Oxford: Berg.
- Southerton, D., Chappells, H. and Van Vilet, B. (2004) *Sustainable Consumption – The Implications of Changing Infrastructures of Provision*. Edward Elgar: Cheltenham.
- Spaargaren, G. (2003) Sustainable consumption: a theoretical and environmental policy perspective, *Society and Natural Resources: An International Journal*, 16(8), 687-701.
- Stephenson, J., Barton, B., Carrington, G., Doering, A., Ford, R., Hopkins, D., Lawson, R., McCarthy, A., Rees, D., Scott, M., Thorsnes, P., Walton, S., Williams, J. and Wooliscroft, B. (2015). The energy cultures framework: Exploring the role of norms, practices and material culture in shaping energy behaviour in New Zealand. *Energy Research and Social Science*, 7, 117-123.

- Stern, P.C. (2000) Towards a coherent theory of environmentally significant behavior, *Journal of Social Issues* 56, 407-424.
- Sweeney, P. (2008) *Ireland's Economic Success: Reasons and Lessons*. Dublin: New Island.
- Sustainable Energy Authority of Ireland (2012) Better Energy Homes Scheme. SEAI: Dublin. Available at: http://www.seai.ie/Grants/Better_energy_homes/Better_Energy_FAQ/ Better Energy Homes Scheme.
- Tanner, C., Kaiser, F.G. and Kast, S.W. (2004) Contextual conditions of ecological consumerism: A food purchasing survey, *Environment and Behaviour*, 36(1), 94-111.
- Thaler, R. and Sunstein, C. (2008) *Nudge: Improving Decisions about Health, Wealth and Happiness*. Yale University Press: New Haven and London.
- Thøgersen, J. (2005) How may consumer policy empower consumers for sustainable lifestyles? *Journal of Consumer Policy*, 28, 143-178.
- Tudor, T., Robinson, G.M., Riley, M., Guilbert, S. and Barr, S.W. (2011) Challenges facing the sustainable consumption and waste management agendas: perspectives on UK households, *Local Environment*, 16(1), 51-66. DOI: 10.1080/13549839.2010.548372.
- United Nations Environment Programme (UNEP) (2008) *Planning for change: Guidelines for national programmes on sustainable consumption and production*. United Nations Environment Programme.
- Viklund, M. (2004) Energy policy options – from the perspective of public attitudes and risk perceptions, *Energy Policy*, 32, 1159-1171.
- Vining, J. and Ebreo, A. (1992) Predicting recycling behaviour from global and specific environmental attitudes and changes in recycling opportunities, *Journal of Applied Social Psychology*, 22(20), 1580-1607.
- Whitehead, M. (2014) *Environmental Transformations*. Routledge: New York.
- Willis, R.M, Stewart, R.A., Panuwatwanich, K., Williams, P.R. and Hollingsworth, A.L. (2011) Quantifying the influence of environmental and water conservation attitudes on household end use water consumption, *Journal of Environmental Management* 92, 1996-2009. DOI: 10.1016/j.jenvman.2011.03.023.