A Natural History of an Environmentalist: Identifying Influences on Pro-sustainability Behavior Through Biography and Autoethnography

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Abstract: This natural history of an environmentalist uses autoethnography through biographical interview to investigate the contextual analysis of influences affecting active pro-sustainability behavior, which is interpreted as environmentalism. Education for sustainability categories of environmental, socio-cultural, political and economic factors were used to identify factors that interact to influence affective and cognitive domains, which affect environmentalist behavior. These influences in reality operated symbiotically but for purposes of analysis they have been portrayed sequentially. The portrayal of the autoethnographer's vocabulary of motives and identity theory applied to group commitment were used as analytic tools. The research methodology employed provides a strategy for investigating biography, which gives access to lived experience as a basis for understanding factors influencing environmentalism. Processes of metacognition and reflexivity, supported by critical engagement with co-researchers, provide access to deep analysis of the biography. Whilst it was not possible to make statistical generalizations from a single case study it was possible to make limited qualitative generalizations, or in other words "*moderatum* generalizations." Subsequent examination of the natural histories of other life-long environmentalists would certainly not reveal detailed similarities in terms of specific biographical occurrences. However, the abstract categories of influence outlined provide a useful template for further investigating the process of activist identity development which we know little about at the present time.

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1. Introduction

We are at a critical time of human history during an unprecedented period of what are commonly considered to be human induced global environmental threats to human populations and ecosystems. Such environmental threats are diverse and include: potentially disastrous effects of climate change (ACKERMAN & STANTON, 2006) associated with anthropogenic greenhouse gas increases (MASLIN, 2009; MASTRANDREA & SCHNEIDER, 2010); increasing pollution with associated damage to human health and ecosystems (EHRLICH & EHRLICH, 2008); resource depletion that requires some four or more planets to compensate the average consumption levels of members of the world's middle classes (ENVIRONMENTAL PROTECTION AUTHORITY VICTORIA, 2010); increasing population growth, with significant increases in the middle classes in the developing world, which will intensify impact on global consumption (FRIEDMAN, 2008); and major biodiversity loss in which we are at present considered to be in a sixth major extinction period (DIAMOND, 1992). The gravity of the problems affecting the world's ecosystems is exemplified by the extent of biodiversity loss as confirmed in the International Convention on Biological Diversity in Nagoya, Japan, which provided a "Red List" of threatened species with some one in five vertebrates presently at risk, and with extinction rates one thousand times greater than the average calculated from the fossil record (CONVENTION ON BIOLOGICAL DIVERSITY, 2010). [1]

Responding to allay these potentially catastrophic threats, individuals, groups and governments need to act constructively and urgently based on motivation for appropriate action supported by informed understanding of the problems and consequences of action choices (JENSEN, 2002). However, as KUCKARTZ (2009) demonstrated from surveys in Europe about responses to climate change, while many people may be sensitive to the issues (80-90%), fewer are knowledgeable (20-50%) but even fewer take personal action to combat the problem (5-20%). Governments are also unwilling to take sufficient action. For example, compelling evidence for climate change from the INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (2010) and economic analysis of its impact (STERN, 2010) indicate that the benefits of strong, early action on climate change to minimize greenhouse gas emissions enable future savings that considerably outweigh economic costs of early action, in addition to preserving the natural environment and preventing potential social disasters. In spite of such evidence providing an imperative for action, government representatives were unable to achieve an agreement about international action to address climate change in the United Nations Framework Convention on Climate Change (UNFCCC), in Copenhagen 2009. Although the recent climate change conference at Durban agreed to internationally binding changes to be ratified by 2020, no specific targets are yet in place and it seems likely that annual emissions over the next decade will be too high to prevent global warming of 2C, which is the accepted level above which dangerous environmental damage is likely to result (PEARCE, 2011). [2]

In this global context, there is an urgent need for effective education for sustainability (EfS) leading to appropriate action, and this is confirmed by its high international significance, as demonstrated by UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANISATION's (UNESCO) highlighting of EfS in the United Nations Decade of Education for Sustainable Development (2005-2014), which "seeks to integrate the principles, values, and practices of sustainable development into all aspects of education and learning, in order to address the social, economic, cultural and environmental problems we face in the 21st century" (UNESCO, 2010, p.1). [3]

The problem of linking knowledge of environmental problems with appropriate action is well reported. For example, KOLLMUSS and AGYEMAN (2002) discuss the knowledge action gap and the associated barriers to action, and JENSEN (2002) identifies the challenge of how to develop what he describes as action competence for pro-environmental behavior, which is the central purpose of EfS. Human behavior is complex, not always predictable and is influenced by "emotional reasoning" rather than merely based on information or rational understanding of issues, leading to sometimes contradictory or compromised action (GOLEMAN, 1995; NORRIS, 2000). Acknowledging these complexities of behavior, this article contributes to understanding influences on pro-sustainability action by presenting the findings of autoethnographic research, which attempts to investigate factors that may inform pro-sustainability action through analysis of the processes that influence the development of an environmentalist. [4]

There is limited research investigating processes influencing environmentalism (as an example, see BIGGER & WEBB, 2010), and autoethnography as a methodology to investigate influences on environmentalist behavior provides a novel approach. The environmentalist and autoethnographer as the focus of the research (third named author) is selected as a case study example of someone who has protection of the environment as a significant goal in life and offers a useful focus for identifying possible influences on actions. The study provides an account of a "natural history" of being an environmentalist and identifies contextual influences on affective and cognitive domains, which interact to motivate and inform action for sustainability (LITTLEDYKE, 2008). As a case study, the research provides an in depth analysis of environmentalist activity, which informs the wider issues of EfS and how it may be possible to foster the conditions for pro-sustainability behavior. Although the study cannot claim a cause and effect relationship between behavior and contextual influences, which is problematic for any qualitative study, it offers insights into the complex interaction between the development of pro-sustainability attitudes and practices. The study also develops a contribution to research methodology as a process for using autoethnography and biographical interview to explore in depth, real life, lived experience as a basis for examining evidence for contextual influences on behavior. The research process has implications for informing EfS, as a way of using metacognitive analysis and reflexivity to understand the significance of the interactive, circular relationship between experience and action (ARCHER, 2007). [5]

2. Changing Views and Definitions About Human Relations With the Environment

Views and terminology about human relations with the environment have changed historically. Preservation of wilderness was an early nineteenth century preoccupation that led to the development of government owned national parks as a means of protecting sensitive environment regions. However, the 1960s heralded the emergence of the so-called environmental movement in response to reports of pervasive global threats from human activity, such as pollution and resource depletion with associated habitat and ecosystem destruction (CARSON, 1962; MEADOWS, RANDERS & BEHRENS,1972). In this context it was useful to distinguish between conservationists who are essentially concerned with natural ecosystem protection and environmentalists who are actively concerned to allay the wider damaging effects of human activity (DUNLAP, 1980). Historically, conservation arose from an appreciation of nature and desire to conserve natural environments, which was associated with Environmental Education. Environmentalism arose from a desire to engage in activities to influence human behavior and protect environments from damage, which was later associated with Education for Sustainability. The differences are about action involved in environmentalism. Traditionally, environmental education (EE) focused on study and preservation of the natural environment including reference to human impact, which was particularly supported by science education, while EfS has emerged more recently with a wider, focus, concerned with the development of appropriate attitudes, values and behaviors in line with sustainable development across all aspects of life contexts. Sustainable development is defined in the BRUNDTLAND REPORT "Our Common Future" made by the World Commission on Environment and Development in 1987 as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (cited in UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS, 1999, p.1). This definition allows sustainability to be conceptualized in a number of ways to inform EfS (LANG, 2005):

· *ecological sustainability*: the integrity of ecological systems and diversity are sustained;
· *economic sustainability*: people have livelihoods that are underpinned by appropriate and sustainable development and resource use;
· *socio-cultural sustainability*: diversity of social and cultural norms and traditions are respected with harmony;
· *political sustainability*: there are societal processes that encourage good governance, social participation, and active citizenship. [6]

EfS, therefore, must address these four components, which makes it essentially interdisciplinary in nature and with wider implications than EE. [7]

Historically, therefore, an environmentalist is an activist within the environmental movement. Whilst this is a useful and still commonly used term, there is no current equivalent and useful term for an activist promoting pro-sustainability, as

sustainability is defined above. For clarity, the term environmentalist is used in this study as a person whose views, attitudes and behavior actively supports sustainability, while the environmentalist chosen as the focus for autoethnography has been active during the period of history that has seen the early emergence of the environmental movement and is morphing into the current wider focus on sustainability. Hence, the historical changes that have occurred as contexts for the biography provide useful contexts for analysis. [8]

3. Theoretical Frameworks and Research Methodology

Key research questions for the autoethnographical study drawing on biography are:

* What factors may influence the attitudes and behavior of an environmentalist?
* What are the potential implications for EfS? [9]

There are a number of theoretical frameworks and research methods that are relevant to answering these questions. The broad theoretical framework underpinning the research is *symbolic interactionism* in which "researchers view the social world as constructed interactionally via language, communication, interrelationships and social groups" (ALLEN-COLLINSON & HOCKEY, 2005, p.189). Assumptions within symbolic interactionism are included within the epistemology of *constructionism*, in which people engage and construct meaning through interactions with each other and the world they are interpreting (CROTTY, 1998). In this process there is no "objective" truth to be discovered, rather meaning is socially constructed, and interaction as a fluid, context dependent process is open to investigation by qualitative research methods such as autoethnography, as applied to this study. [10]

Subsumed within symbolic interactionism, *identity theory* is important to interpreting the study's findings. Identity theory, as applied to behavior, which is particularly relevant to this study, is grounded in the writings of MEAD (1934) who stressed the interrelationship of society, identity and action and was developed by STRYKER and BURKE (2000) into a model based on two hypotheses:

1. the higher the salience of identity relative to other identities incorporated into the self, the greater the probability of behavioral choices in accord with the expectations attached to that identity;
2. the salience of an identity reflects commitment to the role relationships requiring that identity. [11]

STRYKER and BURKE's adaptation of MEAD's theory thus reads as "commitment shapes identity salience shapes role choice behaviour" (2000, p.286). Thus, behavior is a function of a person's perception of group membership and the meanings they attach to views of themselves. In the context of environmentalism, perceptions of group membership are significant, as environmentalists can see themselves as part of various social groups, as well as considering themselves linked to wider connections and relationships with the

environment. In interpreting behavior we also make use of MILLS's concept of "vocabularies of motive" (1940), in which representative language used by participants is important to provide explanations of why behaviors may be adopted. In effect, such vocabularies constitute "those specific terminologies that individuals employ in given social situations to justify the past, sustain the present, or endorse intended future actions" (TREVINO, 2012, p.52). [12]

Autoethnography (TRAHAR, 2009; ELLIS, ADAMS & BOCHNER, 2011) is the research method applied to the study. The term, originally accredited to HAYNO (1979), has begun to be increasingly used and accepted within sociological and anthropological research (OAKLEY & CALLAWAY, 1992; REED-DANAHAY, 1997; BUTZ & BESIO, 2004; HUNT & RUIZ JUNCO, 2006; HALUZA-DeLAY, 2008; MUNCEY, 2010), while STARR (2010) discusses its use in educational research. However, there is still debate about its appropriateness, and other congruent terms, such as self-narrative, personal narratives, ethnographic autobiography, co-exist (ELLIS & BOCHNER, 2000). Autoethnography, as the term implies, involves research on one's self and provides an innovative approach to ethnography. It is selected for this study, as the process gives deep access to lived experiences, with the research subject integral to the research as a researcher and as the research subject. Autoethnography is aligned to ethnography, which gives detailed social accounts based largely on in-depth interviewing or constructed by participant observation (POLE & MORRISON, 2003), while metacognition and reflexivity, which are inherent in the autoethnographic process, provide access to deep analysis of lived experiences to provide an account of how issues of identity may influence behavior. Metacognition involves high order thinking, in this case as analysis of the significance of the research process and findings. Reflexivity involves self-reference in analysis to identify the significance of the impact of the researcher on the research process and the impact research process has on the researcher. Both processes are inherently important in autoethnography. The traditional approach to ethnography of researcher and research subjects has been considered by some as being problematic because of the "silent" role of the author who constructs the ethnographic text (VAN MAANEN, 1995) and that the represented voices of those being researched may seem "orchestrated to serve the theoretical needs of the absent, disembodied author" (SPARKES, 1995, p.164). Autoethnography's strength is that it can communicate "the immediacy, the physicality and emotionality of the experience but also its psychological and social elements, the internal dialogue of the writer with her/himself and also situate the experience within its wider social context" (ALLEN-COLLINSON & HOCKEY, 2005, p.193). However, while the approach gives access to authentic personal insights, it also challenges the traditional orthodoxy of researcher as neutral and silent, which may leave the autoethnographer vulnerable to criticisms of being "irrational, particularistic, private and subjective, rather than reasonable, universal, public, and objective" (GREENHALGH, 2001, p.55). In this study, some of these issues are alleviated by co-researchers providing support for the autoethnographer to achieve increased focus and depth of representation through a Rogerian style role as facilitator in interview (ROGERS, 1961); the latter's role being to explore and extend the research data, in addition to

engaging in dialogue and providing critical comment on analysis of the research data while raising other views where appropriate, and with critical challenges to deepen and widen the interpretation of the findings. There are also precedents for interviewees being involved in the authoring of research papers within fields as diverse as studies of sport and occupations (e.g. EVANS, HARDY & FLEMING , 2000; GRIFFITHS & MACK, 2007). While autoethnographic accounts are commonly written in first person, this paper provides an analytic summary of the main findings of the autoethnographic process, which also included the co-researchers. Thus, although the primary autoethnographic data was constructed in first person tense, this analytical summary is presented in third person tense to reflect the secondary analytic process. [13]

The third named author as autoethnographer, the primary researcher and the research subject, experienced the main decades from the 1950s incorporating the early emergence and establishment of the environmental movement during which time environmental education was used as a term for studying the environment, followed by the time when education for sustainability emerged in response to the increasingly evident and threatening sustainability issues facing the planet. As the autoethnographer was active as an environmentalist during the period, the research provides a case study via a chronological record of personal responses of an environmentalist to important historical changes in human relationships with the environment. A number of research methods are available to an autoethnographer, according to the purpose of the research, such as a use of diaries, field notes, memories and reflections on experiences. In this study the primary data was constructed through biography, and this was analyzed to identify contextual, chronological influences on behavior. A summary of the process follows: [14]

In preparation, and over a period of days, the autoethnographer reflected on significant life memories as experiences that were felt to be important influences on being an environmentalist. The experiences were either general contextual influences acting over a period of time, or particular events as epiphanies that caused some significant change in perception. DENZIN describes use of epiphanies in biographical research as important events to uncover meaning: "In moments of epiphany, people redefine themselves ... The interactionist locates epiphanies in those interactional situations in which personal troubles become public issues ... In this way the personal is connected to the structural, through biographical and interactional experiences" (1992, pp.26-27). Sketches as symbols of the experiences and notes were made during the reflection period to represent a coalescence of the essential features of the experiences. Such use of symbols (as may be produced in dreams) is commonly used to explore personal meaning in psychotherapy process (WIESS, 1986) and is employed here as a technique to represent and to explore meaning of significant experiences in the biography.

1. A life history time line as a scroll of paper divided into ten-year periods was constructed, and the key influences were placed on appropriate places on the time line as symbols representing experiences with brief summaries written in boxes to show a chronological sequence of the influences.

2. A follow up audio-recorded interview was held with a co-researcher acting as facilitator to assist in expanding the details of the experiences and their significance. The time line and transcribed interview were the primary research data for analysis.

3. For analytic purposes, the data were broadly themed into the four categories of EfS, as environmental, socio-cultural, economic and political, and presented in chronological order as experiences in childhood (pre-school and school age), early adult (18-30 years old) and mature adult (post 30 years old). These categories were chosen, as the EfS themes are commonly used categories to identify sustainability issues, and they are useful categories to extricate the main influences from what were complex experiences acting over multiple and interactive levels. The age categories were chosen to broadly reflect a developmental sequence in maturation of the autoethnographer.

4. The data were analyzed to identify strands of influences showing development through childhood, early and mature adulthood for each EfS related category.

5. The data were also analyzed to identify a range of types of environmentalist behavior and affective and cognitive influences on the behavior.

6. Identity theory (STRYKER & BURKE, 2000) and vocabularies of motive (MILLS, 1940) were used as theoretical frameworks to identify the influences and their significance.

7. Implications of the analysis for EfS were explored through considering possible education strategies that could be used to promote positive affective and cognitive influences to inform pro-sustainability behavior.

8. Co-researchers engaged critically and constructively with the autoethnographer throughout the process to assist in extending and widening, where relevant, the perspectives, understanding, analysis and conclusions. [15]

A form of the constant comparative method of analysis (CHARMAZ, 2006) was used to analyze the interview data. This form of analysis allowed us to identify thematic categories and contextual influences and to see if these were constant and biographically significant throughout the development of a life course. We have not generated a grounded theory in the traditional sense but we have used the mode of data analysis linked to that approach. The theory we have used (symbolic interactionism) does however have strong links historically with grounded theory methodology, particularly via the work of Anselm STRAUSS (LEGEWIE & SCHERVIER, 2004). [16]

4. Biography and Influences on Environmentalist Behavior

Describing autoethnography as a process cannot capture its distinctive quality to engage readers with the experiences of the writer. The following examples from the childhood phase of the biography of an epiphany event and a general influence affecting later environmentalist behavior illustrate how autoethnographic writing invites the reader to visualize, empathize with and vicariously feel the experiences that are represented and to understand their influences:

> "One of my earliest memories was as a small child before I started school. I put an apple seed in a pot of soil and I was amazed when it started to grow into a little plant. It seemed like magic to me at the time that the little seed from the apple I had eaten had started to change into what I could see was a little tree, which would grow much bigger in time. It gave me a sense of awe, wonder and beauty in nature and got me really interested in living things. ... It stimulated in me a strong interaction with nature and its processes, which I've had ever since and has influenced my desire to protect the natural environment" (Audio recording; the early epiphany experience of processes in nature was symbolized on the time line as a drawing of growing seedling).

> "I was born just after the war in North East of England in 1948 and my early life in my family was austere—we had very little but we just made do. Rationing was still in place when I was very small. I wasn't aware that we were relatively poor at the time— like most people in the area after the war—and I never thought about it, but we never expected much either. Life was full, as we played outside in natural areas for most of the time. ... This has made me aware of not being wasteful and not buying lots of unnecessary stuff, which is an important aspect of sustainability to minimise consumption to essentials and reduce effects on resources and pollution" (Audio recording; the early, extended experience of austerity was symbolized on the time line by a drawing of money with a cross through it and extend through the early childhood period by an arrow). [17]

MILLS's theory of vocabularies of motive is illustrated well in these examples, as both extracts show clearly through the language used how early experiences influence later motives for environmentalist behavior: the first extract illustrates a "desire to protect the natural environment," and the second extract illustrates an awareness of "not being wasteful and not buying lots of unnecessary stuff," which are both centrally important actions to support sustainability. [18]

As is common for qualitative research, a great deal of rich data was generated from the research process; hence, it is only possible to present here examples to illustrate the process of biography construction and summaries to illustrate the main findings. Tables 1-5 show biographical examples of influences and their impact on the three phases in the life of the autoethnographer. [19]

4.1 Influences of environment

Tables 1 and 2 show examples of how relations with the environment developed. Table 1 refers to experiences that influenced cognitive and affective responses to the environment (natural ecosystems). Table 2 refers to influences that informed ethical action to protect the environment. The early experience of the "magic" of seeing a plant grow from a seed was influential during a period of a developing sense of beauty, awe and wonder in appreciating nature. Such early affective experiences promoted a sense of empathy with and care and concern for the natural environment, which was supported cognitively initially by school and then later university biology, particularly as negative human influences of the environment became evident through university lectures, wider reading and active involvement in environmentalist communities. In addition, early ethical parental influences promoted honesty, truthfulness and responsibility. In particular, the epiphany event of finding some money and being persuaded to take it to the police station because it would have been important to the person who lost it made it clear that others can be directly affected by our actions, which is an essential basis for informed ethical action, as put into practice later through active campaigning on environmental issues and teaching, research and publication in the field of EfS.

Period	Influence	Impact
Child	Growing an apple seedling from an apple seed	Sense of "magic," beauty, awe and wonder in my response to living things Early introduction to biological changes and processes
Early adult	Final year degree lecture on human ecology	Shock at finding out about the extent of the damaging impact of humans on environment Understanding of complex interrelations of ecology and human impact Motivation for action
Mature adult	Research and publications on EfS	Identifying the issues of sustainability and the nature of the problems Identifying choices in action needed for EfS Identifying strategies for teaching effective EfS

Table 1: Biographical examples of influences and impact: Environment

Period	Influence	Impact
Child	Honesty emphasised ... I found money on the street, and my father persuaded me to take the money to the police station	Importance of responsibility and truthfulness in relationships Understanding that effects of actions on others are important
Early adult	Involved in campaigns with Friends of the Earth[1] to promote environmental action (e.g. against aerosols and CFCs, lead in petrol, greenhouse gases and global warming, nuclear waste dumping, depletion of peat reserves for compost, damaging effects of toxic agricultural chemicals)	Highlighting damaging effects of environmental issues to the public to achieve social change through influencing social or political choices
Mature adult	Professional work for EfS via teaching, research, conference presentations, symposia, speaking on public platforms against pollution	Developing EfS to promote affective and cognitive change for pro-sustainability action

Table 2: Biographical examples of influences and impact: Environment and ethical action [20]

4.2 Economic influences

Table 3 showing examples of economic influences illustrates how early post war austerity experiences as a child developed an avoidance of waste and excessive consumption of consumer goods in later life, which is an important aspect of sustainable living to conserve resources and limit pollution and greenhouse gas emissions associated with production processes. A period of attempted "self-sufficiency" in the 1970s on a farm in Anglesey, North Wales involved growing organic vegetables for family consumption as well as local sale; this was a deliberate attempt to explore ways of living in ways that can promote environmental sustainability, and was embraced consciously as part of the so-called counterculture, which was characterized as a largely American and British inspired movement, originating in the 1960s and becoming international in the early 1970s. The counterculture movement had multiple environmental, social, political and economic dimensions, which was an early call for sustainability and challenged the "technocracy" as a regime of technological and corporate expertise that dominated industrial society (ROSZAC, 1969). Although it was

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1   Friends of the Earth, formed in 1971 in UK, is an environmental action group engaged in a range of campaigns to raise awareness to influence behavior and governmental policy to protect the environment.

always evident that actual self-sufficiency was never a realizable or even desirable objective in a western context, the autoethnographer's later lifestyle patterns essentially maintained values and attitudes associated with limited purchase of consumer items and mineralization of household waste to reduce ecological impact. This also included being a vegetarian throughout adult life as an intentional way to contribute as an individual to sustainability. The reasons are complex and include: reduced global greenhouse gas emissions associated with climate change (linked to methane produced by ruminants, as well as extra oil based agrochemicals, particularly as fertilizers, needed to grow food for the animal food industry); reduced ecological impact by eating low on the food chain (involving significantly less use of land than animal production); minimized intake of potentially health affecting toxic agricultural chemicals (for example pesticides and growth hormones, which tend to concentrate up food chains); and not supporting animal suffering associated with the animal food industry.

Period	Influence	Impact
Child	Post war austerity	Low income and few consumer goods available resulted in simple living with low environmental impact
Early adult	Developed "organic" farm with attempt at "self-sufficiency," including growing and local sale of vegetables	Active experiment in sustainable living Understanding of links between lifestyle and environmental impact
Mature adult	Relatively low use of consumer items, recycle and compost waste, cycle to work, vegetarian	Actions to support sustainable practice in personal life through reducing ecological impact via lifestyle

Table 3: Biographical examples of influences and impact: Economic [21]

4.3 Political influences

Table 4 shows examples of political influences, which strongly stimulated a sense of injustice through early awareness of Nazi atrocities during the war and the importance of resistance to oppression, as exemplified by my father's front line infantry fighting against the German army through most of the war. This sense of injustice was compounded by early experience of my German mother's bad treatment by her father in law and neighbors in the North East of England after the war (father and mother met in Berlin at the end of the war). In addition, being a child in a working class community in a "socialist heartland" supported by a tradition of coal mining meant that values of collective community connections and associated responsibilities to family, friends and neighbors were absorbed as part of the *zeitgeist* of the area. Later choices in career were strongly influenced by these early experiences, as damage to the environment stimulated a sense of injustice against destructive human exploitation of the living world and a sense of

responsibility for environmental protection. Taking on the role of University "Environmental Officer" in mid-twenties was an active decision to explore and coordinate actions to find ways to protect the environment and to support a personal ethical need for positive action. Also, several career options in pest control were rejected, though they were potentially lucrative. These options were contradictory ethically because of environmental damage, which became obvious through direct involvement in the pest control industry in Switzerland, East Africa and as an applied aspect of a PhD study involving leaf-cutting ants, which are South American pests of plantations (though essential for ecological balance in rainforests). Posts were offered directly and personally by influential personnel in pest control research in Switzerland, Solomon Islands and USA, all being rejected on ethical grounds, while a research post that was available in Paraguay was rejected because of potential pesticide pollution issues, but also because an unwillingness to cooperate with the right wing military junta that was in power at the time.

Period	Influence	Impact
Child	Lived in "socialist heartland" of North East England (within coal mining communities) with English father and German mother who came to England after World War Two	Absorbed a strong sense of social justice from social and political environment Bad treatment of mother by some as "the enemy" gave a sense of injustice (at her personal treatment, but also about the atrocious acts of the Nazis)
Early adult	University "Environmental Officer"	Response to the injustice of destruction of the environment
Mature adult	Rejected several options of careers in pest control and insecticide use, which were perceived as part of a polluting industry. Took up education as a career	Career path uncompromised by not supporting environmentally damaging industries Education pursued as a positive path for promoting change and sustainability Applied humane treatment, facilitating individual empowerment as teacher and as a manager in education, as these principles are essential to sustainability

Table 4: Biographical examples of influences and impact: Political [22]

4.4 Socio-cultural influences

Table 5 shows examples of socio-cultural influences, which illustrate how early experiences of play in natural environments and watching wildlife programs on television influenced a choice of studying biology at school and university, which led to a professional interest in environmental education and in EfS, as it was later defined. Professional activities as a school and university teacher-researcher emphasize integrated, meaningful approaches to teaching and learning, which lie

at the heart of EfS. Also, wide reading and influences from media such as film and TV documentaries, with later involvement in internet social network communications informed a deepening sense of understanding of the factors affecting interconnectedness in the human-nature interface, which informed professional action in teaching, research and the dissemination of ideas.

Period	Influence	Impact
Child	Played mainly outside, fascinated by nature and particularly enjoyed natural history television	Engagement with nature through play Introduced to biology and ecology through media, books and school
Early adult	Studied applied biology including, ecology and entomology (Zoology BSc and PhD). Wide reading from literature including science, psychology, philosophy, politics, religious/spiritual and counter culture texts plus similar themes from film and other media	Developing understanding of scientific processes, ecological relations and underpinning psychology, philosophy and ethics
Mature adult	Integrated approach to teaching and learning e.g. taught and coordinated science, design and technology, drama, music, maths at school and university level. Continuous wide reading and media influences such as film, TV, also including internet and use of online social networks communications	Understanding of integrated approaches to EfS. Deeper understanding of influencing factors, particularly drawing on complexity theory, neurophysiology, evolutionary psychology and ethical/spiritual factors with interconnections from global sociology, politics and economics. Influences on teaching and extended dissemination of ideas through publications, conferences and networking

Table 5: Biographical examples of influences and impact: Socio-cultural [23]

4.5 Influences on affective, cognitive domains and behavior

Figure 1 summarizes the biographical influences on affective, cognitive domains, and actions as an environmentalist. Contextual environmental, socio-cultural, political and economic influences are interrelated and provide a complex interplay of factors affecting the affective and cognitive domains, which have a direct bearing on behavior for pro-sustainability action. Aspects of the *affective domain* relevant to environmental sensitivity emerging from the biography are categorized into: aesthetics, including a sense of beauty and harmony; spirituality, including a

sense of awe and wonder, connectedness, empathy and care; and ethics, including a sense of equity, fairness, responsibility and respect for the environment. Aspects of the *cognitive domain* relevant to inform environmental action are: identification and critical understanding of sustainability issues, and implications and consequences of choices of actions affecting sustainability. As LITTLEDYKE (2008) emphasizes, integration of affective and cognitive domains is essential to influence informed action for sustainability, which supports GOLEMAN's (1995) view that emotional intelligence is a vital ingredient in integrated learning, and GARDNER's (1983, 1993) multiple intelligences model, which shows that intelligence has multiple dimensions, including cognitive and affective domains. This integrated model for sustainability action is supported by developments in neurophysiology, which confirm that thought and emotion are closely linked through neural pathways, involving the sensory thalamus, which links to the amygdala as part of the limbic system (the emotional center of the brain) to the sensory cortex, where reasoning activities take place (LE DOUX, 1998; DAMASIO, 1999). Thus, concepts, feelings and behaviors are all highly interconnected and these are involved in the formation of attitudes and beliefs, which are involved in constructing value systems that underpin environmental relationships (BRODY, 2005).
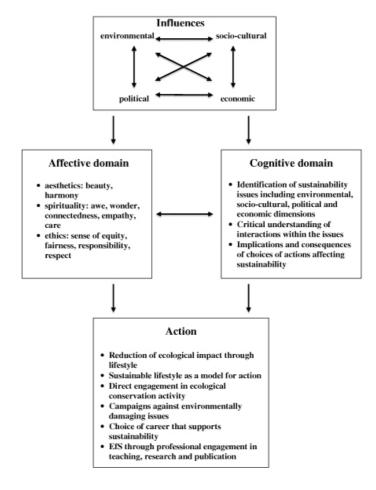

Figure 1: Effects of contextual biographical influences on affective and cognitive domains and environmentalist action [24]

4.6 Group identity and environmentalist action

The examples shown in tables 1-5 illustrate how behavior in response to life
choices is influenced by biographical influences, drawing on MILLS's theory of
vocabularies of motive (1940). STRYKER and BURKE (2000) also show that
personal identity and actions are influenced by commitment, as affected by
engagement within groups such as social sub-cultures. Such groups have
particular collective values and attitudes, which give meaning and purpose to
activities, and which provide expectations of roles and responsibilities of
members. Identified groups that were particularly important in influencing identity
as an environmentalist are categorized broadly into childhood friends, educational
groups and environmental groups: [25]

4.6.1 Childhood friends

> "As a child I spent as much time as I could outside playing with friends in natural
> places such as making dens in woods and in playing in farmyards and fields. We had
> a great time. I remember we used to climb around on haystacks and swing on a rope
> over a stream to jump in ... I also had a friend whose parents were relatively well off
> and they took me to the Lake District a couple of times. I remember being entranced
> watching trout swimming in a stream surrounded by stunningly beautiful scenery
> around lake Ullswater" (Audio recording).

Playing freely with childhood friends in natural environments was an important
part of childhood experience, which initiated a life long love of nature and keen
interest in living things as a precursor to later environmentalist activity. Such early
experiences are regarded as important in developing affinity for nature. As HYUN
(2005) discusses, children's perceptions of nature are "bondings-to-the-earth,"
which children have across all cultures for their natural environment, described by
WILSON (1984, 1992) as "biophilia," or a love of nature. However, if this natural
propensity is not fostered or negative influences are experienced, the opposite, or
"biophobia," may develop (ORR, 1992, 1994; ORR, 1993), which ranges from
being uncomfortable in natural environments or an actively negative view where
natural environments are viewed as inferior to human constructed contexts. In
this case, the biographical interviewing showed that childhood opportunities for
free play in natural environments were important, with positive influences
stimulating the affective domain, setting predispositions for later pro-sustainability
behavior. Adult choices for work and home locations were correspondingly
influenced by availability of natural beauty (e.g. university in North Wales, then
professional education work in North Yorkshire, South Lincolnshire, the
Cotswolds, South Island of New Zealand and Eastern Australia) and hobbies of
walking, camping and photography reflected this appreciation of nature. [26]

4.6.2 Educational groups

> "I was successful at school but it was incredibly boring. I made up a strategy in my head of pretending that school time passed quickly, while time outside of school stretched out. That helped me to make the most of free time. I made most of that by playing with friends outside or sometimes creatively making up board games inside to play with my brothers when it was bad weather" (Audio recording).

Early schooling involved unimaginative and very limited transmission teaching methods allowing little creative outlet for children. Correspondingly, school was experienced primarily as boring with poor engagement, as school activities mainly lacked meaning or relevance to a young, active mind. As a result there was little commitment to school, and time outside of school was prioritized, even though success was achieved in school testing processes. An exception was when a student teacher encouraged children's involvement through a refreshingly enthusiastic approach and invited some individual choice in topic selection, which resulted in high motivation to learn for a short period. However, at secondary school, though the first five years were not inspiring, biology as a subject was immediately interesting and engaging, and strong interest in biology at 16-18 year old level followed up with university level through to PhD was the basis of a life long fascination with the natural world and commitment to and supporting protection of the environment. Thus, curricular biology at school and university and some good examples of interactive teaching to stimulate student engagement provided a useful structure for cognitively exploring diverse aspects of the living world. Ecology and entomology were particularly interesting because the interrelated features of ecology reflected the natural world as experienced, and entomology reflected a fascination with the weird, alien beauty of insects. Early career choice of agricultural pest control was a natural development from these interests and associated university qualifications, given the relevant employment that was seen to be available at the time. However, direct experiences in Switzerland and East Africa as a researcher on pesticide testing programs confronted the compromised values of the pest control industry where profit emphasis may override environmental safety (in particular, the sale and use of the pesticide DDT (dichlorodiphenyltrichloroethane) in Africa when it was banned at that time in Europe and USA). This experience directly stimulated a change of career from pest control research into education, as education better fulfilled an aspiration to contribute positively to society through educating the next generation to develop improved social and environmental relations. [27]

Compromises emerged, even though early work as a teacher was fulfilling through efforts to promote positive social and environmental values and understanding. Before the introduction of the National Curriculum in England and Wales there was emphasis on processes and experiences in learning, which gave opportunities, particularly as a primary teacher, to develop integrated, creative approaches to teaching and learning that overtly supported EE; however, the introduction of the UK National Curriculum in 1990 (at that time when the autoethnographer was involved with teacher education) emphasized traditional subjects with prescribed content and increased assessment linked to tightly

defined objectives to support supposed parental choice in a quasi competitive schools market, so that integration of learning became more difficult to achieve. As a result, EE became marginalized in many classrooms (for evidence of and analysis of these issues see LITTLEDYKE, 1996, 1997; NATIONAL CURRICULUM COUNCIL, 1990). As EfS has since been defined, in spite of the presence of a fragmented National Curriculum the autoethnographer has endeavored to develop and promote integrated, constructivist approaches to learning that support EfS (e.g. see LITTLEDYKE, 1998; LITTLEDYKE & HUXFORD, 1998; LITTLEDYKE, ROSS & LAKIN, 2000; LITTLEDYKE, TAYLOR & EAMES 2009). [28]

4.6.3 Environmental groups

> "I was involved in a lot of Friends of the Earth campaigns. They were aimed at attracting the public's attention so people could become aware of the campaign issues. So one time we dressed up as aerosol cans outside a chemist's shop collecting signatures to encourage people to stop buying aerosol cans with CFCs. ... Another time we had a campaign about global warming. We set up a beach stall in Peterborough town centre, which is about 50 miles from the sea but will be flooded if sea levels rise with the effects of global warming. We offered free tickets for a pleasure boat ride—it would come into the town centre where the coast will be in 2030. That was in the mid 80s when few people knew about problems of global warming" (Audio recording).

Involvement with campaigning environmental groups provided access to people with congruent worldviews who also support environmental activism. Such groups included the university environmental group, Friends of the Earth and Greenpeace local groups in locations close to workplaces. Early environmentalist activity in the 1970s was seen by most people at the time to be marginal or subversive, as it challenged the *status quo*, though emerging and clear evidence for global environmental problems including potential calamities associated with climate change have vindicated the environmental movement's endeavors to raise awareness of the need for action for sustainability. In addition to working with environmental groups, collaboration with people within education on research and writing projects from an interdisciplinary perspective has been important in extending understanding of the issues and choices for pro-sustainability action for all concerned, including the target audience for publications. In recent years it is interesting that many more people are in broad agreement with environmentalist principles and the Internet has provided wider access to information and sharing of ideas, so that understanding of the issues is more sophisticated now, as well as being more widespread (though too many still deny the overwhelming evidence and general scientific consensus about human influences on environmental decay such as climate change). [29]

In addition, a sense of identity and connection with the wider group that includes the family of all life on Earth has been a major motivation for environmental activism. Such identity is strongly influenced by the knowledge from biology that all life on Earth is connected through evolutionary and ecological relationships

with deep genetic similarities reflecting those relationships (e.g. we share some 50% of genes with bacteria, some two thirds with plants and over 98% with our closest relatives, chimpanzees [JONES, 1994]). Also, knowledge that we are intertwined with and dependent on the natural environment provides a motivation for protecting it—that is, pro-sustainability action is viewed as an imperative as it is a survival issue for our human species as well as for other life on Earth. [30]

5. Implications for EfS

The biography highlights specific contextual issues about the development of environmentalist behavior for the autoethnographer. As a case study the details are not generalizable, but certain principles emerge that are of value to informing EfS: [31]

Whilst it is not possible to make statistical generalizations from a single case study we believe it is possible to make limited qualitative generalizations, or in other words "*moderatum* generalizations" (PAYNE & WILLIAMS, 2005, p.296). We have "abstracted from a given concrete case" of one life- long environmentalist "the features that are essential" (BULMER & BURGESS, 1986, p.251) to the development of that activist identity. These constitute environmental, economic, political, and socio-cultural influences which impacted upon the environmentalist's affective and cognitive domains and thus to the development of his particular identity. In effect we are making qualitative generalizations about the main properties of the case at hand. We are not claiming that a subsequent examination of the natural histories of other life-long environmentalists would reveal detailed similarities in terms of specific biographical occurrences. However, what we do assert is that the abstract categories of influence outlined, are likely to be found in cases of other individuals who are environmental activists, and thus the combination of categories provides a useful template for further investigating the process of activist identity development which we know little about at the present time.

- *Experiences of and in nature*: Such experiences are important in allowing children and adults to absorb the beauty of the natural world (BRODY, 2005) and to develop what WILSON (1984, 1992) terms as "biophilia," or a love of nature, which provides motivation for pro-sustainability behavior. Access to experiences of and in nature is important, as the experiences can foster an interest in and motivation to learn about the environment, as well as developing a sense of care, empathy, respect, reverence, awe and wonder, which can also generate feelings of responsibility to motivate action.
- *Relevance*: Curricula must be relevant to learners for engagement in learning to occur, and ethical significance is significant to justify action. Sustainability is immediately relevant and ethical, as action for sustainability or otherwise, affects quality of life in the present and in the future, which has ethical consequences for intergenerational equity. As sustainability issues are interdisciplinary, they need to be identified as themes with various subject areas contributing knowledge content, processes and skills to investigating

and understanding the underpinning ideas and values behind the issues (e.g.
AUSTRALIAN GOVERNMENT DEPARTMENT OF ENVIRONMENT,
WATER, HERITAGE AND THE ARTS, 2010). For EfS to be developed
effectively in schools it must also be a priority learning area to allow sufficient
time for educational activity.

· *Meaning*: Effective EfS requires active learning, constructivist teaching
methodology with learners involved in selection of investigation approaches
and contexts to engage learners in developing meaningful personal
frameworks of understanding (LITTLEDYKE & HUXFORD, 1998).

· *Connections between actions and consequences*: Such connections are
essential to inform critical understanding and evaluation of the choice options
associated with sustainability issues. Principles of uncertainty, probability and
risk are important features in exploring options, while such concepts need to
be adapted to the age and level of the learner.

· *Choices for preferred options*: Identification of preferred futures is a part of
exploring options for choices for action (JENSEN, 2002). Where there are a
number of interest groups associated with choices it is important to identify
how the various options may affect each group and how each choice impacts
on sustainability. Useful strategies for such approaches may involve critical
discussion of the issues as moral dilemmas (KOHLBERG & TURIEL, 1971)
and use of drama to explore particular contexts through vicariously
experiencing impact of consequences of actions on various players in the
drama (LITTLEDYKE, 1998).

· *Community of action*: Community action provides motivation, support and
encouragement, as well as critical challenge to focus group decisions from
individuals who may hold a range of views. A community can be a school, a
local community or an action group for a specific issue. There are many good
examples of Eco-Schools employing such action communities, though the
practice is not universal (e.g. the Eco-schools England; LAKIN &
LITTLEDYKE, 2008), as other curriculum priorities can restrict the time
available for sustainability-focused activities so that EfS can be marginalized
(LITTLEDYKE, 1997). As an example of good practice, the Environmental
Education Policy of New South Wales, Australia (NEW SOUTH WALES
DEPARTMENT OF EDUCATION AND TRAINING PROFESSIONAL
SUPPORT AND CURRICULUM DIRECTORATE, 2001) gives useful guidance
for action for primary schools with practical strategies to develop pro-
sustainable action through the curriculum, use of resources and grounds. [32]

6. Summary

The autoethnography of an environmentalist through biographical interview
provides a contextual analysis of the various influences affecting pro-sustainable
behavior. EfS categories of environmental, socio-cultural, political and economic
factors were identified as influences that interact to influence affective and
cognitive domains, which affect environmentalist behavior. These influences in
reality operated symbiotically but for purposes of analysis they have been
portrayed sequentially. The portrayal of the autoethnographer's vocabulary of

motives (MILLS, 1940) and identity theory applied to group commitment (STRYKER & BURKE, 2000) were used as analytic tools. The research methodology employed provides a general strategy for investigating biography, which gives access to lived experience as a basis for understanding factors influencing environmentalism. Processes of metacognition and reflexivity, supported by critical engagement with co-researchers, provide access to deep analysis of the biography. As a case study, the contextual features are not generalizable, but the general emergent issues with implications for EfS are discussed and show that experiences of and in nature, relevance for investigation, construction of meaning, making connections between choices and actions, exploring and understanding consequences of choices and action personally and within a community of action are all important for informing effective pro-sustainability action. [33]

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