Environmental attitudes, connection to nature, and conscientiousness of primary school participants in a green-school programme.

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ABSTRACT

Research focused on the effects of participation in a green-school programme, connection to nature, conscientiousness and parental environmental attitudes on the pro-environmental attitudes of primary school children. Study participants included 55 second class and 40 sixth class primary school students comprising 43 males and 52 females and their respective parent. A cross-sectional correlational survey design was employed. While second class students scored significantly higher on the Connection to Nature Index there was no significant difference between groups on environmental attitudes using the New Ecological Paradigm. A weak negative significant relationship was found between conscientiousness and the pro-environmental attitudes of the child with a weak positive significant correlation established between the pro-environmental attitudes of child and parent.
1. INTRODUCTION

Eco-psychology or environmental psychology seeks to examine the complex interactions and relationships between human beings and the natural world from an ecological and psychological perspective to understand and develop ways in which an emotional connection and affinity with nature can be fostered leading to pro-environmental behaviour and sustainable living. ECO-UNESCO (2007) research findings recommended that Education for Sustainable Development principles and approaches be embedded in the formal curriculum in a cross-cutting, holistic way with all school participating in the Green-Schools programme.

Green-Schools – Toward a Sustainable Lifestyle (An Taisce, 2009, p.5) states in bold that “all research carried out shows the Green-Schools programme is having a very significant effect on environmental behaviour and attitudes in Ireland”. While each schools management of their impact on the environment has had a positive influence in reducing consumption, research would suggest that increased levels of environmental knowledge in a green-school do not directly translate to the pro-environmental awareness and attitudes of students (Krnel & Naglic, 2009). While ‘Ireland leading the way in environmental education in schools’ (An Taisce, 2013) measured a saving in excess of €8m, illustrating a positive effect on the environmental behaviour of children within school, it did not provide supporting research evidence to measure the aforementioned effect “on attitudes in Ireland”. Given the financial resources committed to environmental education it is imperative that research data include an examination of attitudes in order to inform and evaluate the ongoing effectiveness of the program.
Consequently this study seeks to contribute to this issue by examining the effect of predictor variables namely age, gender, parental environmental attitudes, connection to nature and conscientiousness on the environmental attitudes of eight year-old and twelve year-old primary school children participating in the green-school programme.

1.1 Eco-psychology

A broad field of study, environmental psychology developed in the US in the 1960’s, examining the psychological factors involved in environmental degradation and the link if any between environmental attitudes and pro-environmental behaviour. By the mid-20th century, environmental costs associated with the benefits of a modern day lifestyle provided largely by the increasing use of fossil fuels was becoming increasingly apparent. Global dependency on non-renewable energy resources lead to the 1973 and 1979 energy crises, reflecting clearly the negative impact of human behaviour on the Earth’s biophysical resources. In contemporary society environmental degradation, climate change and overconsumption continues despite heightened global awareness of the harmful effects on both the delicately balanced eco-system and humankind. Ensuring the future sustainability of ecosystems requires the compromise of environmental, social equity and economic demands. Sustainability requires a change in political decision-making and social thinking which is a challenge encompassing national and international legislation, transport modes, urban planning and lifestyle changes. The Earth Charter launched as a people’s charter in 2000 by the independent Earth Charter Commission, focuses on developing ethical principles for building a sustainable, fair and peaceful global society in the 21st century.

We must join together to bring forth a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace. Towards this end, it is imperative that we, the peoples of Earth, declare our responsibility to one another, to the greater community of life, and to future generations. Earth Charter (2009, para.1)
1.1.2 Environmental Knowledge and Pro-Environmental Behaviour

Kollmous & Agyeman (2002) acknowledged the complexities in understanding the “roots of direct and indirect environmental action” when examining “why do people act environmentally and what are the barriers to pro-environmental behaviour”? Despite the identification by many researchers (Gardner & Stern, 2002) of a gap between the environmental knowledge and awareness of an individual and subsequent pro-environmental behaviour a definitive reason has not yet been found. Using a meta-analysis of numerous theoretical frameworks and models to explain this gap, Kollmous & Agyeman (2002) developed a model based on factors most frequently found to have a positive or negative effect on pro-environmental behaviour. The study confirmed earlier findings of Fietkau and Kessel (1981) and did not acknowledge a significant relationship between environmental knowledge and pro-environmental action.

Kaisser (1998, 2004) contend that practice of environmental behaviours is dependent on the obstacles and difficulties associated with implementing the environmental behaviour. A ‘pro-environmental consciousness’ complex comprising environmental knowledge, values, attitudes, affective involvement being rooted in an individual’s personal values and moulded by personality traits and other internal and external social and cultural factors underpinned Kollmous & Argyeman’s model of pro-environmental behaviour. Individuals with a strong internal locus of control are confident in their ability to bring about environmental change while those with an external locus of control believe their actions are incapable of effecting any change. Of interest to this paper is the conclusion drawn by Kollmous & Argyeman (2002, p.248) “The longer the education, the more extensive is the knowledge about environmental issues. Yet more education does not necessarily mean increased pro-environmental behaviour”. It was found that conscientiousness; extraversion, openness to
experience, and agreeableness dimensions of the five-factor model of personality were related to Environmental Attitudes (McCrae & Allik, 2002; McCrae & John, 1992). Despite males exhibiting a greater level of environmental awareness than females, in general females exhibit higher levels of environmentally friendly attitudes and behaviours (Diamantopolous, Schlegelmilch, Sinkovics, & Bohlen 2003; Lovelock, 2010)

1.1.3 Children’s Environmental Attitudes and Behaviours

Kollmous & Argyeman (2002, p.252) defines attitudes as “enduring positive or negative feeling about some person, object, or issue” and is closely related to one’s beliefs and knowledge. Evans, Brauchle, Haq, Stecker, Wong & Shapiro (2007) contend that gaining an understanding of the development patterns of children’s environmental attitudes and behaviours is an integral component in ensuring a sustainable planet and aim to use findings as a basis for longitudinal study of the development of environmental attitudes and behaviour from early childhood into adulthood. Research on children’s attitudes to date has primarily focused on moral reasoning underpinning emerging belief structures and comprehension of nature (Kahn & Kellert, 2002). In a concluding statement Melson (2013, p.21) stated that “the world is full of moral and ethical questions. How children answer those questions will affect how all life forms on the planet will fare in the future”.

Using games developed from the widely used New Ecological Paradigm (Dunlap, Van Lierre, Mertig & Jones, 2000) for adults and qualitative data, Evans, Brauche, Haq, Stecker, Wong, & Shapiro (2007) found that 6 to 8 year old children held a moderately high level of environmental attitudes while behaving in an ecologically friendly manner. The validity of these findings however requires replication with samples of children from all socio-economic groups. Equally pro-environmentally biased parents who may have a role in shaping the development of children’s environmental attitudes and behaviours influence the selection of
participating children in the study. Kahn (1999) following cross-sectional comparisons found that children around the age of 11 years become less anthropocentric.

Chawla’s (2009) analysis of research on three developmental models stresses the importance of socializers or role models in the child’s life, empathy and sympathy as a basis of care for the natural world and the provision of opportunities to achieve environmental goals by means of mastery experience thereby increasing a sense of self-efficacy. Airbus (2009) following a survey of 1,500 children in the UK between age 5 and 10 and their parents conclude that children have little bio diversity knowledge. Laaksoharju and Rappe (2010) found that rural children have a closer connection to nature than urban children with girls being more interested in plants than boys. Similarly Muller, Kals & Pansa, R. (2009, p.65) found that girls spent more time in nature, expressed more willingness for pro-environmental commitment than boys and “children’s emotional affinity towards nature was a significant predictor of children’s willingness for prop environmental commitment”. Cincera and Krajhanzl (2013) reported that girls displayed a higher level of action competence than boys for pro-environmental behaviour.

Research findings by Cheng and Monroe (2010, p.46) suggest that “learning, understanding, experiencing nature, and living close to nature could positively influence the development of children’s affective attitude toward nature”. Wells and Evans (2006) as cited in Cheng and Monroe (2010, p.35) researching adults retrospective experiences in nature before the age of 11 found a positive relationship between time spent in nature to pro-environmental attitudes in adulthood. Cheng and Monroe concluded that research studies “suggest that experience in nature during youth may stimulate people’s interest in pro-environmental attitudes and practices”. Research supports a correlation between affective attitudes toward nature and parental attitudes and values, past experience in nature and

Kals. Et. al. (1999) found that “family values toward nature are a strong predictor of children’s connection to nature” and therefore “young children’s attitudes are highly influenced by their family members (cited in Cheng & Monroe, 2010, p.45). In conclusion research to understand environmental attitudes of young people is important given the skills needed to develop solutions to future environmental problems and challenges (Bradley, Waliczek & Zajicek, 1999). Evans et al. (2007, p 657) concludes by stating that “research on this important topic is truly in its infancy. Much important, path-breaking work lies ahead’.

1.2 Environmental Education and ECO/Green Schools

Founded in Ireland in 1986, ECO-UNESCO in the area of Education for Sustainable Development aims to raise awareness, understanding and knowledge of our environment, promote the protection and conservation of our environment and the personal development of young people through practical environmental projects, programmes and initiatives. The Green-School programme underpinned by ESD principles is an international environmental education programme, environmental management system and award scheme that promotes and acknowledges long-term, whole school action for the environment. It is an initiative of FEE - Foundation for Environmental Education which has members in 62 countries worldwide and is referred to internationally as Eco-Schools.
Over 800,000 primary, secondary and special school students in Ireland (>90% of all Irish schools) are currently participating in the programme under 6 themes waste, energy, water, travel, biodiversity, global citizenship. The Environmental Education unit of An Taisce in partnership with Local Authorities have co-ordinated the programme since 1993 growing from a staff of one to a full time staff of 58 and a turnover in 2013 of €3.5m. An Taisce ‘Ireland leading the way in environmental education in schools’ 2013 recorded a saving in excess of €8m in waste, energy, water and transport fuel costs during the last school year by participating primary, secondary and special schools directly. It is recommended that the Green-school committee in each school should be as student led as possible and can compose a combination of students, teachers, non-teaching staff, parents and members of the Board of Management or wider community.

1.2.1 Evaluation of Eco-school Education Programmes

In practice while students make up the largest proportion of green-school committee members, it is the teachers who direct and allocate resources to the programme. Often practices and procedures enforced within the school leave the child with only the environmentally-friendly option. An example of this would be a whole school policy to take lunch waste home to reduce waste, installation of self-closing taps to reduce water or a designated student to close the door or turn off the lights to reduce energy. Similarly parental decisions regarding transport to school often leaves the student without a choice of sustainable transport modes. Upon evaluation of factors influencing action competence for pro-environment behaviours in the Czech Republic, Cincera and Krajhanzl (2013) found that action competence was affected by perceived participation in the decision-making process. However there was no difference in action competence between schools with and without a green flag.
Boeve-de-Pauw and Van Petegem (2013) state that Eco-schools apply a pedagogical approach that impacts only on utilisation values and thereby fail to affect their students’ preservation values and environmental behaviour. As cited in Tseverni (2011, p.55) ‘there is no direct link between environmental knowledge and pro-environmental behaviour or scientific knowledge and people’s activation’. Critics of environmental education programmes cite the inability of children to develop a relationship with the environment based on the expression of their own critical thought and speech, action competence, expression of experiences and emotions, willingness to participate and take independent action as a shortcoming (Jensen, 2004).

Jensen and Schnack (2006, p.475) conclude that as a result of a “focus on the transfer of knowledge about environmental problems, pupils do not have the ability to investigate the root causes of problems and do not have the ability to act”. Reid, Jensen, Nikel and Simovska (2008) contend that a strong need exists for an alternative approach to environmental education centered on child participation and action. Kahriman- Ozturk and Tuncer (2012, p.650) following a study of children’s environmental attitudes concluded that “educational programmes at the preschool stage need to be broadened and improved, particularly in the provision of outdoor study in natural settings for the children to develop a more ecocentric attitude toward the environment”. Bonnet and Williams (2006) while researching issues relating to environmental education delivered through the curriculum in the UK, stressed the need for more emphasis on pupil discussion and involvement in environmental action. Hungerford and Volk (1990) and Legault and Pelletier (2000) stressed the importance of the environmental commitment and enthusiasm of the teacher to effectively communicate the pro-environmental message to students impacting student attitudes.
In conclusion Kopnina (2011,p.2) reported that with ‘few exceptions (e.g. Rideout, 2005) very few of the environmental attitude and behaviour measures were focused on evaluation of EE, nor have there been longitudinal studies examining the influence of education on the environmental attitudes of children.”

1.3 Pro-Environment Attitudes – New Ecological Paradigm for Adults and Children

For the purposes of this study the criterion variable measured will be the pro-environmental attitudes of children attending a school participating in the green-school programme. According to Anderson (2012, p.261) the NEP-Revised, a self-report measure is “probably the most widely used measure of environmental values or attitudes worldwide” often used to assess the impact of educational programs aiming to measure individuals’ core beliefs concerning their relationship to the natural world. The New Ecological Paradigm originally published in 1978 by Dunlap & Van Liere and revised in by Dunlap, Van Lierre, Mertig, and Jones (2000) strengthening the internal consistency, validity, reliability and usefulness of the tool at measuring the level of adult environmental concern and underlying ecological worldview..

Manoli, Johnson, & Dunlap (2007) modified a NEP Scale for Children (NEP-C), with 10 instead of 15 items and revised wording appropriate for use with children aged 10-12 years. The New Ecological Paradigm for Children (NEP-C) is modelled on the New Ecological Paradigm-Revised (NEP-R) for adults. Kopina (2011,p.10) recommended that the “NEP scale needs to be developed in order to address the efficacy of environmental education”.

1.3.1 Connection to Nature

This study proposes to examine the variable connection to nature as a predictor of pro-environmental attitudes. Millar and Tesser (1986) conclude that attitudes comprise both a
cognitive component in respect of one’s beliefs and an affective component in respect of one’s feelings. Mayer & Franz (2004, p.504) while developing the Connectedness to Nature (CNS) scale contended that the NEP alone is “not an adequate measure of one’s affective, experiential relationship to the natural world as it seems to measure cognitive beliefs rather than affective experience”. Ernst and Theimer (2011) developed the Nature Connectedness Inventory addressing the elements that appear to influence environmental attitudes with the inclusion of items examining children’s feelings when in nature.

In 2010, Cheng and Monroe’s new Connection to Nature Index (CNI) identified key factors impacting on children’s affective attitude toward the natural environment namely sympathy, empathy, interest in nature, experience with nature and self-efficacy. The authors state the suitability of this index to children aged from 8 to 10 years due to the developmental changes in vocabulary and interests as the children mature. Bragg, Wood, Barton, and Pretty (2013, p.35) for the UK and Europe’s largest conservation charity RSPB reported that “connection to nature was not affected by gender”. In conclusion the researchers suggest that “the index can be a useful tool” for “environmental educators who are interested in measuring children’s affective attitudes toward nature” (Cheng & Monroe, 2010, p.46).

1.3.2 Conscientiousness

Research conduct will consider conscientiousness in children as a predictor of pro-environmental attitudes. Researchers have tried to identify personality traits that are related to high environmental concerns and pro environmental attitudes. Costa & McCrae (1998) described a highly conscientious individual as dependable, motivated to achieve, prudent and self-disciplined. Following a factor analysis, researchers identified descriptors of conscientious in children modelled on studies of the Big Five personality traits in adults (John, Caspi, Robins, Moffit, Stouthamer-Loeber, 1994; Lamb, Chaung Wessel, Broberg and
Hwang, 2002). The most common descriptors of conscientiousness include self-control, industriousness, responsibility and orderliness. In this study a parent rated their children’s conscientiousness trait using the observer-based big five questionnaire (BFQ-C) for children (Barbaranelli, Caprara, Rabasca, & Pastorelli, 2003). While not exhaustive a search of published research failed to provide research evidence directly examining or linking conscientiousness to children’s environmental attitudes.

In conclusion independent variables namely conscientiousness, connection to nature and parental environmental attitudes respectively measured using the Big-Five Questionnaire for Children, Connection to Nature Index, New Ecological Paradigm Revised (NEP-R) will be examined in order to predict a relationship to the dependent variable in this case children’s pro-environmental attitudes as measured by the New Ecological Paradigm for Children (NEP-C). In addition variables namely length of participation in the green-school programme and gender will also be considered as predictors of pro-environmental attitudes.

1.4 Rationale of research study

Research evidence outlined in earlier text would seem to contradict the statement by An Taisce (2009, p.5) contending that “research carried out shows that the Green-Schools programme is having a very significant effect on environmental behavior and attitudes in Ireland”. This contradiction and lack of research evidence to support this statement prompted this research study. This study aims to address this gap in the green-school evaluation literature by exploring the relationship between the participation of children in acquiring awareness, knowledge and understanding of our environment through curriculum instruction and increasing positive environmental attitudes after four years and eight years in a green-schools programme.
It is also of interest to the author to investigate children’s environmental attitudes with respect to gender, parental attitudes, and connection to nature for the purposes of comparison with international research findings. In contrast, research evidence correlating conscientiousness directly with children’s environmental attitudes is not available to the best knowledge of the author. Therefore this study proposes to add to research findings by investigate the relationship between these two variables.

1.4.1 Hypothesis: It was predicted that

(i) No significant difference exists between length of participation in the Green-school programme and children’s pro-environmental attitudes or connection to nature.

(ii) Levels of connection to nature significantly predict a relationship to pro-environmental attitudes.

(iii) Levels of conscientiousness will be positively correlated to pro-environmental attitudes.

(iv) No significant correlation exists between the attitudes of the parents and attitudes of the child to the environment.

(v) A significant difference exists between the attitudes to the environment of boys and girls.

(vi) A significant difference exists between the connection to nature of boys and girls.
2. METHODOLOGY

2.1 Participants

The study participants comprised 95 students and 95 adults. Student participants consisted of second and sixth class students in a co-educational green-school in a predominately middle class town in North County Dublin selected from a student population of 81 second class students and 76 sixth class students. The student sample was comprised of second class students respondents (N=55, M=28, F=27, Mean Age= 8.6) and sixth class students respondents (N=40, M=15, F=25, Mean Age=12.6). Adult participants consisted of a parent of each second class respondent (N=55) and each sixth class respondent (N=40) student. Participation of student and parent was voluntary with (N=78) second class students and (N=74) sixth class students completing the survey. Participation in the study required the completion of both the student and corresponding parent questionnaire. 152 parent contacts were made (N=152, 100%) and 95 completed parental surveys were received (N=95, 62.5%).

2.2 Design

This study employed a cross-sectional correlational design using a survey approach. An analysis of relationships was conducted between children’s environmental attitudes, the criterion variable and a number of predictor variables namely the length of participation in the green-school programme, connection to nature, conscientiousness, parental environmental attitudes. In addition gender differences in children’s environmental attitudes, connection to nature and conscientiousness were examined. Students were assigned to a group based on their class level. Parents were assigned to a group based on their child’s class level.
2.3 Materials

Environmental Attitudes

New Ecological Paradigm Revised (NEP-R) (Dunlap, Van Lierre, Mertig & Jones, 2000)

The NEP-Revised, a 15 “polar” statement survey was designed in the US by environmental sociologists Dunlap et. al. (2000) and has undergone extensive psychometric development for more than two decades to measure a shift from a dominant social paradigm (DSP) in the 1960’s and 1970 to a more environmentally conscious paradigm (NEP) in the 1980’s. Seven items and eight items reflect commitment to the DSP and NEP respectively in the following dimensions: the reality of growth limits (1,6,11), anti-anthropocentrism (2,7,12), fragility of nature’s balance (3,8,13), rejection of exemptionalism (4,9,14) and possibility of eco-crisis (5,10,15). The DSP focuses on humans viewing themselves as separate from nature and morally superior to other organisms (Lundmark, 2007) reflected in the anti-anthropocentrism element of the scale. Pirages and Ehrlich (1974 cited in Dunlap, 2008b, p.452) contend that the DSP includes “not only core conservative values such as individualism, laissez-faire government and private property rights, but also faith in technology, resource abundance, unlimited growth and endless progress”. In contrast the emergence of a new environmentally aware belief system is ecocentric in nature and according to Taylor, 1992 as cited in Lundmark (2007, p. 332) “casts serious doubts on the anthropocentric idea of an absolute dividing line between human beings and nature”.

Half of the 15 items NEP scale is worded so an ‘agree’ response is environmentally positive. The others are worded so as a ‘disagree’ response is environmentally positive. Negative statements 2, 4,6,8,12,14 had their polarity reversed for this analysis. The scale is
scored by calculating a mean of 15 items rated using a 5-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree).

Dunlap & Van Liere (1978) and Dunlap et. al. (2000) as cited in Evans et. Al. (2007, p.639) confirmed that the NEP scale has “high temporal reliability and evidenced high integral consistency across multiple heterogeneous samples” revealing “excellent reliability and validity”. Dimensions overlap on the NEP (2000) for example eco-crisis with balance of nature, therefore component analyses has revealed considerable cross factor loading with high internal consistency with a Cronbach’s alpha of .84 reliability for the overall NEP scale. Predictive, content, and known-group validity was also established by Dunlap et. al (2000). “Nearly all contemporary discussions of adult’s environmental attitudes rely on Dunlap and Van Liere’s NEP” (Evans et. al. 2007, p.639).

New Ecological Paradigm Scale for Children (NEP-C) (Manoli, Johnson, & Dunlap, 2007)

While researchers use the NEP Scale widely with adults, it was not designed for use with children. Manoli et. al. (2007) revised and validated the New Ecological Paradigm (NEP) Scale for use with upper age primary school (fifth grade) informed. A 3-dimensional modified NEP Scale for Children was devised, assessing three subscales that contribute to one’s “environmental world view” including “rights of nature,” “eco-crisis,” and “human exceptionalism.” The survey includes 10 instead of 15 items and revised wording, appropriate for use with children aged 10-12 years. Similarly negative questions 3, 6, 7, and 9 had their polarity reversed for this analysis. The scale is scored by calculating a mean of 10 items rated using a 5-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). Reliability of .84 and validity established for adult version of the NEP serves as the model for this version.
Connection to Nature Index (CNI) (Cheng & Monroe, 2010)

Cheng & Monroe (2010) interviewed senior primary age children (fourth grade) children when formulating this index to accurately gain an understanding of their attitudes toward nature and experiences in nature. 4 prime dimensions or subscales emerged in children’s connection to nature: enjoyment of nature (questions 1-6, 13); empathy for creatures (questions 7-10); sense of oneness (questions 11-13) and sense of responsibility (questions 14-16). The CNI is a trait measure which has been designed and tested for use in determining changes over a relatively long period of time which makes this instrument particularly suitable for use in an eco-school setting as outlined in report by Bragg, Wood, Barton, and Pretty (2013, p.29) for RSPB “one of the intended uses of this instrument is for program evaluation”.

The scale is scored by calculating a mean of 16 items rated using a 5-point Likert scale, from 1(strongly disagree) to 5 (strongly agree) with higher scores indicating a stronger connection to nature than lower scores. Bragg et. al. (2013) concluded that the CNI “works well with children between the ages of 8-12 years”. Cheng & Monroe (2010, p.38) report a reliability score of a Cronbach’s alpha of .87 upon final revision of the index. Finally in conclusion Bragg et. al. (2013, p.46) following a study using 3 measures of connection to nature report that “the CNI seemed to be the preferred measure; being the easiest to complete; a trait measure; with and overall score sub factor; specifically designed and validated for use with children in the chosen group; and is statistically reliable”.

Big Five for Children (BFQ-C) (Barbaranelli, Caprara, Rabasca, & Pastorelli, 2003).

The Big Five Questionnaire for Children (BFQ-C) is a 65-item scale assessing the five basic traits of personality (i.e., the Big Five) in children and adolescents: (1) extraversion
(2) agreeableness (3) conscientiousness, (4) neuroticism and (5) intellect/openness. For this study conscientiousness of the student was chosen as an independent variable to predict environmental attitudes based on a 9 item parent report instrument (questions 3, 8, 13, 18, 23, 28, 33, 38, 43) assessing the child’s self-discipline, orderliness, precision, and the fulfilment of commitments (e.g., ‘My child likes to keep all my school things in a great order’). Barbaranelli, Caprara, Rabasca and Pastorelli (2003) reported a high positive correlation between the BFQ-C completed by the child and the parent assessment of the child’s personality using the BFQ-C. Questions are rated on a 5-point Likert scale, ranging from 1 (disagree strongly) to 5 (agree strongly). Negative questions (8, 18, 23, 43) had their polarity reversed for this analysis. Both Muris, Meesters, and Diederen (2005) and Del Barrrio Carasco and Holgado (2006) endorsed the psychometric properties of the BFQ-C with Barbaranelli, Fida, Di Guinta and Capara (2008) finding convergent validity for all five personality factors using multi-trait methods and confirmatory factor analysis.

2.4 Procedure

An opt-out consent form was sent to parents two weeks before administering questionnaires. Five opt-out forms were returned before commencement of the study. Participation was voluntary and pupils were free to leave the study at any time. The 10 item New Ecological Paradigm for Children and the 16 item Connection to Nature Index on a single sheet were administered in a classroom setting to six different classes. All instructions regarding completion of questionnaires were given verbally. The author of this study read the questions aloud for three classes of second class students (mean age=8.6) in three different sittings clarifying any ambiguity or confusion expressed by respondents. Completion of the questionnaire alone without consultation with others was stressed. Both questionnaires were administered to three classes of sixth class students (mean age=12.6) in three sittings. The
questions were read by the children themselves and any clarification was given by administrator on request. The students were informed that the survey was to “find out what they thought and felt about the environment and nature”. An age appropriate definition or understanding regarding the words “environment” and “nature/natural” was sought by the author from the children. The terms ‘strongly agree’, ‘agree’, ‘neither agree nor disagree’, ‘disagree’ and ‘strongly disagree’ were explained in age appropriate terms and instructions were given to place a tick in the box under the statement which best described their opinion. Oral instruction, clarification and completion of both questionnaires took approximately twenty minutes for second class students and ten minutes for sixth class students. Each respondent on completion of questionnaire was given two questionnaires on a single sheet, the Big Five Questionnaire for Children (conscientiousness) and the New Ecological Paradigm Revised for completion by a parent. When returned completed parent questionnaire was matched to student questionnaire and included in the study. Student respondents who did not return a parent questionnaire were not included in the study.

2.5 Data Analysis

Data was analysed using the Statistical Package for Social Science (SPSS) Version 21. Analysis included descriptive statistics, independent t-test and Pearson correlation coefficient.
3. RESULTS

3.1 Environmental Attitudes of Children

Descriptive statistics for the 95 student participants included in the analysis who completed the New Ecological Paradigm for Children (NEP-C) can be seen in Table 1. Of the respondents 43 (44.8%) were male and 52 (54.2%) were female. Scores ranged from a high of 50 to a low of 17 with a mean of 37.03 and a standard deviation of 4.85 (mean=37.03, SD=4.85). Male students scores ranged from a high of 50 to a low of 17 with a recorded mean of 37.23 and a standard deviation of 5.94 (mean=37.23, SD=5.94). Female students scores ranged from a high of 49 to a low of 31 with a recorded mean of 36.87 and a standard deviation of 3.76 (mean=36.87, SD=3.76).

Table 1  New Ecological Paradigm for Children - Means and Standard Deviations

<table>
<thead>
<tr>
<th>New Ecological Paradigm for Children</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
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</table>

3.2 Children’s Connection to Nature

Descriptive statistics for the 95 student participants included in the analysis who completed the Connection to Nature Index can be seen in Table 2. Of the respondents 43 (44.8%) were male and 52 (54.2%) were female. Scores ranged from a high of 80 to a low of 50 with a mean of 70.03 and a standard deviation of 7.12 (mean=70.03, SD=7.12). Male students scores ranged from a high of 80 to a low of 50 with a recorded mean of 68.56 and a standard deviation of 7.72 (mean=68.56, SD=7.72). Female students scores ranged from a
high of 80 to a low of 55 with a recorded mean of 71.25 and a standard deviation of 6.41 (mean=71.25, SD=6.41).

3.2.1. Enjoyment of Nature

Analysis of descriptive statistics across each of the four dimensions record as follows. Scores on Enjoyment of Nature ranged from a high of 35 to a low of 16 with a mean of 29.51 and a standard deviation 4.25 (mean=29.51, SD=4.25). Male students scores ranged from a high of 80 to a low of 50 with a recorded mean of 28.51 and a standard deviation of 4.64 (mean=28.51, SD=4.64). Female students scores ranged from a high of 80 to a low of 55 with a recorded mean of 71.25 and a standard deviation of 6.41 (mean=71.25, SD=6.41).

3.2.2 Empathy for Creatures

Scores on Empathy for Creatures ranged from a high of 20 to a low of 13 with a mean of 18.30 and a standard deviation 1.76 (mean=18.30, SD=1.76). Male students scores ranged from a high of 20 to a low of 13 with a recorded mean of 17.81 and a standard deviation of 2.08 (mean=17.81, SD=2.08). Female students scores ranged from a high of 20 to a low of 16 with a recorded mean of 18.71 and a standard deviation of 1.32 (mean=18.71, SD=1.32).

3.2.3 Sense of Oneness

Scores on Sense of Oneness ranged from a high of 15 to a low of 9 with a mean of 13.56 and a standard deviation 1.51 (mean=13.56, SD=1.51). Male students scores ranged from a high of 15 to a low of 9 with a recorded mean of 13.47 and a standard deviation of 1.71 (mean=13.47, SD=1.51). Female students scores ranged from a high of 15 to a low of 10 with a recorded mean of 13.63 and a standard deviation of 1.33 (mean=13.63, SD=1.33).
3.2.4 Sense of Responsibility

Scores on Sense of Responsibility ranged from a high of 15 to a low of 8 with a mean of 13.34 and a standard deviation 1.41 (mean=13.34, SD=1.41). Male students scores ranged from a high of 15 to a low of 8 with a recorded mean of 13.09 and a standard deviation of 1.54 (mean=13.09, SD=1.54). Female students scores ranged from a high of 15 to a low of 10 with a recorded mean of 13.55 and a standard deviation of 1.27 (mean=13.55, SD=1.27).

Table 2  Connection to Nature - Means and Standard Deviations

<table>
<thead>
<tr>
<th></th>
<th>Connection to Nature</th>
<th>Enjoyment of Nature</th>
<th>Empathy for Creatures</th>
<th>Sense of Oneness</th>
<th>Sense of Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>43</td>
<td>43</td>
<td>43</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>70.03</td>
<td>29.51</td>
<td>18.30</td>
<td>13.56</td>
<td>13.34</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>68.56</td>
<td>28.51</td>
<td>17.81</td>
<td>13.47</td>
<td>13.09</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>71.25</td>
<td>30.35</td>
<td>18.71</td>
<td>13.63</td>
<td>13.55</td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
<td>7.12</td>
<td>4.25</td>
<td>1.76</td>
<td>1.51</td>
<td>1.41</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>7.72</td>
<td>4.64</td>
<td>2.08</td>
<td>1.71</td>
<td>1.54</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>6.41</td>
<td>3.74</td>
<td>1.32</td>
<td>1.33</td>
<td>1.27</td>
</tr>
</tbody>
</table>

3.3 Conscientiousness

Descriptive statistics for the 95 student participants included in the analysis whose parent completed the Big Five Children’s Questionnaire on conscientiousness can be seen in Table 3. Of the respondents 43 (44.8%) of their children were male and 52 (54.2 %) were female. Scores ranged from a high of 54 to a low of 20 with a mean of 35.32 and a standard deviation of 6.75 (mean=35.32, SD=6.75). Parent of male students scores ranged from a high of 54 to a low of 20 with a recorded mean of 33.88 and a standard deviation of 6.75.
Parent of female students scores ranged from a high of 45 to a low of 21 with a recorded mean of 36.51 and a standard deviation of 6.53 (mean=36.51, SD=6.53).

### 3.4. Adult Environmental Attitudes

Descriptive statistics for the 95 parents participants included in the analysis who completed the New Ecological Paradigm Revised (Dunlap et. al. 2000) can be seen in Table 4. Scores ranged from a high of 75 to a low of 24 with a mean of 53.64 and a standard deviation of 10.20 (mean=53.64, SD=10.20). Analysing the Dominant Social Paradigm (DSP) dimension the scores recorded ranged from a high of 35 to a low of 12 with a mean of 23.37 and a standard deviation of 5.42 (mean=23.37, SD=5.42). Analysing the New Ecological Paradigm (NEP) dimension the scores ranged from a high of 35 to a low of 13 with a mean of 26.79 and a standard deviation of 4.72 (mean=26.79, SD=4.72).

#### Table 3 New Ecological Paradigm for Adults Revised – Means and Standard Deviations

<table>
<thead>
<tr>
<th></th>
<th>NEP-R</th>
<th>Dominant Social Paradigm (DSP)</th>
<th>New Ecological Paradigm (NEP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>95</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Mean</td>
<td>53.64</td>
<td>23.27</td>
<td>26.79</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>10.20</td>
<td>5.42</td>
<td>4.72</td>
</tr>
</tbody>
</table>

### 3.5.1 Hypothesis (i) – No significant difference exists between length of participation in the Green-school programme and children’s pro-environmental attitudes or connection to nature

Second class students (mean=37.58, SD=5.184) were found to have a higher level of pro-environmental attitudes than sixth class students (mean=36.28, SD=4.29) as outlined in Table 4. The 95% confidence limits show that the population mean difference of the
variables lies somewhere between -.686 and 3.30. An independent sample t-test found that there was no significant statistical difference between environmental attitudes of second and sixth class students (t (93) =1.302, p=1.96). Therefore the null hypothesis is accepted.

Second class students (mean=72.80, SD=6.18) were found to have a higher level of connection to nature than sixth class students (mean=66.23, SD=6.70) as outlined in Table 4. The 95% confidence limits show that the population mean difference of the variables lies somewhere between 3.95 and 9.20. An independent sample t-test found that there was a significant statistical difference between connection to nature of second and sixth class students (t (93) =4.968, p=.000). Therefore the null hypothesis is rejected.

3.5.2 Hypothesis (ii) – Levels of Connection to Nature Significantly predicts pro-environmental attitudes.

The mean scores for children’s connection to nature was 70.03 (SD=7.13) and for environmental attitudes was (SD=4.85) as seen in Table 5. A Pearson correlation coefficient found that there was a weak positive significant relationship between children’s connection to nature and environmental attitudes (r (95) =.247, p<.016). Therefore the null hypothesis is rejected.

3.5.3 Hypothesis (iii) - Levels of conscientiousness will be positively correlated to pro-environmental attitudes.

The mean scores for children’s environmental attitudes was 37.03 (SD=4.84) and for conscientiousness was 35.33 (SD=6.75) as seen in Table 5. A Pearson correlation coefficient found that there was no significant relationship between children’s environmental attitudes and conscientiousness (r (95) =-.037, p<.721). Therefore the null hypothesis is accepted.
3.5.4 **Hypothesis (IV) – No significant correlation exists between child and parent environmental attitudes.**

The mean scores for children’s environmental attitudes was 37.03 (SD=4.84) and for parent’s environmental attitudes was 53.64 (SD=10.20) as outlined in Table 5. A Pearson correlation coefficient found that there was a weak positive significant relationship between children and parents environmental attitudes (r (95) =.257, p<.012). Therefore the null hypothesis is rejected.

3.5.5 **Hypothesis (v) – A significant difference exists between the environmental attitudes of boys and girls.**

Male students (mean=37.23, SD=5.94) were found to have a higher level of pro-environmental attitudes than female students (mean=36.87, SD=3.76) as seen in table 4. The 95% confidence limits show that the population mean difference of the variables lies somewhere between -1.62 and 2.36. An independent sample t-test found that there was no significant statistical difference between environmental attitudes of male and female students (t (93) =.351, p=7.27).

3.5.6 **Hypothesis (VI) - A significant difference exists between the connection to nature of boys and girls.**

Female students (mean=71.25, SD=6.42) were found to have a higher level of pro-environmental attitudes than male students (mean=68.58, SD=7.72) as illustrated in Table 4. The 95% confidence limits show that the population mean difference of the variables lies somewhere between -5.63 and .244. An independent sample t-test found that there was no significant statistical difference between connection to nature index of male and female students (t (93) =-1.86, p=.067). However there was a significant difference in enjoyment of
nature (t (92) =-2.13, p=0.36) and empathy for creatures (t (92) =-2.43, p=0.18) with females recording a higher mean score.

Table 4 Independent T-Test displaying the difference between the class levels groups and gender groups Group for Environmental Attitudes and Connection to Nature of children.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>do</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Attitudes of Children</td>
<td>Second Class</td>
<td>37.38</td>
<td>5.18</td>
<td>1.30</td>
<td>93</td>
<td>1.96</td>
</tr>
<tr>
<td></td>
<td>Sixty Class</td>
<td>36.28</td>
<td>4.29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection to Nature</td>
<td>Second Class</td>
<td>72.80</td>
<td>6.18</td>
<td>4.97</td>
<td>93</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Sixty Class</td>
<td>66.23</td>
<td>6.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment Attitudes of Children</td>
<td>Male</td>
<td>37.23</td>
<td>5.94</td>
<td>0.35</td>
<td>93</td>
<td>7.27</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>36.87</td>
<td>3.76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection to Nature</td>
<td>Male</td>
<td>68.58</td>
<td>7.72</td>
<td>-1.82</td>
<td>93</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>71.25</td>
<td>6.42</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 Pearson Correlational Analysis of Connection to Nature, Conscientiousness and Environmental Attitudes of Parents on the Environmental Attitudes of Children

<table>
<thead>
<tr>
<th>Variables</th>
<th>Environmental Attitudes of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection to Nature</td>
<td>.247*</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.037</td>
</tr>
<tr>
<td>Environmental Attitude of Parents</td>
<td>.257**</td>
</tr>
</tbody>
</table>

*significant at p<.016

** significant at p<.012

3.4.7 Dominant Social Paradigm and New Ecological Paradigm of Parents

Second class parents (mean=23.46, SD=5.43) were found to have a higher level of attitudes influenced by the Dominant Social Paradigm worldview than sixth class parents (mean=23.03, SD=5.47). The 95% confidence limits show that the population mean difference of the variables lies somewhere between-1.82 and 2.70. An independent sample t-test found that there was no significant statistical difference between the dominant social paradigm worldview of second and sixth class parents (t (92) =-.385, p=.701).
Second class parents (mean=26.85, SD=4.90) were found to have a higher level of attitudes influenced by the New Ecological Paradigm worldview than sixth class parents (mean=26.73, SD=4.54). The 95% confidence limits show that the population mean difference of the variables lies somewhere between -1.82 and 2.07. An independent sample t-test found that there was no significant statistical difference between the new ecological paradigm worldview of second and sixth class parents (t (92) =-.130, p=.897).
5. DISCUSSION

5.1 Finding and Hypotheses

This study intends to address the lack of research evidence available by the co-ordinators of the green-schools programme in Ireland on the environmental attitudes of participant primary school students. Evaluative research literature focuses primarily on recording savings in utilisation and consumption of resources namely waste, energy, water and CO2 emissions. Statements made by An Taisce (2009, p.5) highlighting the positive effects of the green-school programme on attitudes in Ireland has not been corroborated by supporting research evidence. Independent samples t-test and Pearson’s r correlations analysed children’s environmental attitudes with respect to length of participation in the green-school programme, connection to nature, conscientiousness, and parental attitudes, for the purposes of comparison with international research findings.

Findings concurred with the first hypothesis confirming there was no significant difference in the attitudes of children after a four year and eight year period of participation in the green-school programme. In support of the second hypothesis a positive significant relationship albeit weak was found between connection to nature and pro-environmental attitudes. A relationship between conscientiousness and children’s environmental attitudes was deemed to be insignificant and contrary to the third hypothesis which predicted the existence of a relationship between these two variables.

Findings indicated that a positive relationship although weak exists between the environmental attitudes of child and parent contradicting the assertions of the fourth hypothesis that no significant relationship existed. Gender differences in children’s environmental attitudes were not found conflicting with the fifth hypothesis. In partial
support of the sixth hypothesis significant gender difference was found in respect of the enjoyment of nature and empathy for creatures dimensions of children’s connection to nature with females showing higher mean scores. However no significant gender difference was recorded when assessing the total score on the connection to nature index including the two remaining dimensions of oneness with nature and sense of responsibility.

Of interest to the author of this paper was the breakdown of parental environmental attitudes in respect of both a dominant social paradigm worldview and the new ecological paradigm worldview. No significant difference was recorded in environmental attitudes between second class and sixth class parents considering all 15 items on the scale or on items associated with the dominant social paradigm and new ecological paradigm worldview.

5.2 Findings and Established Theory and Research

As outlined earlier (introduction 1.1.2) research evidence conducted by Kollmous & Argyeman (2002) asserted that an increase in environmental knowledge did not conclusively lead to an increase in environmentally friendly behaviour. Similarly the increased knowledge gained during eight years in the green-school program did not lead to increased pro-environmental attitudes or connection to nature among sixth class students as compared to their second class counterparts who had attended a green-school for four years. This finding could be interpreted from two viewpoints.

The first perspective positively asserts that participation in the programme for four years is adequate to cement a high level of pro-environmental attitudes which are consolidated as the children progress through the latter 4 years of primary school education. Environmental attitude mean scores recorded for both second and sixth class measured using the NEP for children were high in the top 25-30%. Hungerford & Volk (1990) and Leeming,
Porter, Dwyer, Cobern and Oliver (1997) suggest that continued exposure to an environmental education programme may be an important factor in encouraging and maintaining ecological attitudes in children. There is a shift as the child reaches early adolescence regarding the level of influence exerted by parent, teachers and peers therefore the maintenance of pro-environmental attitudes is a welcome finding. Stimulating peer discussions among young adolescents enhances the advancement of moral reasoning and moral behaviour (Walker, Henning, & Krettenauer, 2000).

The alternative perspective views these finding as negative contending that the children’s pro-environmental attitudes should be higher given that children of 12.5 years differ from children of 8.5 years in terms of stages of moral development, stages of cognitive development leading to greater knowledge and understanding of environmental issues, increased independence and power of thought and decision-making and locus of control. Kellert (1989) when studying children’s attitudes toward animals suggested that a ‘moralistic’ attitude develops in the teen years. Similarly Dunlap (1989) concurred that boys aged 12-14 years old used less advanced moral reasoning, typically stage two or three of Kohlberg’s Stage compared with boys in their mid-teens.

There was however a significant difference recorded between second and sixth class in respect of connection to nature with second class showing higher levels of connection to nature than their sixth class counterparts. This may in part be due to the increased amount of time an 8 year old spends playing outside compared with the increasingly indoor focused activities of a 12 year old. Malkus (1999) returned similar findings in the U.S.A. as “first graders were significantly more concerned about the environment than third or fifth graders”.

An increase in connection to nature significantly correlates to an increase in pro-environmental attitudes. While no significant gender difference was recorded in pro-
environmental attitudes, sense of oneness with nature and sense of responsibility this was not the case in enjoyment of nature and empathy for creatures dimensions. Girls were found to have a significantly higher score on these dimensions supporting research that girls are more likely than boys to show kindness, compassion and sympathy toward other humans and animals (Spitvak & Howes, 2011). Allen & Ferrand (1999) found that “sympathy, the proxy measure of actively caring used in this study, mediated the relation between personal control and environmentally friendly behaviours”.

Care-giving of young dependents is viewed by children from age five as a feminine activity with girls motivated to take part in more nurturing activities than boys (Melson, Fogel & Toda, 1986). Findings support research outlined in the introduction by Diamantopolous, Schlegelmilch, Sinkovics, & Bohlen 2003 and Lovelock, 2010 regarding the environmentally friendly attitudes and behaviours of females.

Contrary to hypothesis an increase in parental environmental attitudes correlated positively with an increase in children’s environmental attitudes. Parenting style and modeling have been found to affect pro-social behaviours of children namely caring and helping, which in turn predicts care of and empathy for nature and animals (Melson, 2013, deGuzman, Carlo, & Edwards, 2008). Bryant (1990) as cited in Melson (2013,p.97) reported a predictive link between parents and child’s humane attitudes “eight-to-thirteen year olds who felt that their parents were emotionally available and responsive also endorsed more humane attitudes toward animals”.

Research findings on conscientiousness in children as a predictor of pro-environmental attitudes and connection to nature did not support earlier evidence relating the conscientiousness dimension of the five-factor model of personality in adults to Environmental Attitudes (McCrae & Allik, 2002; McCrae & John, 1992). Conscientiousness
as a personality trait of the sample students did not significantly correlate to pro-environmental attitudes representing the most unexpected finding of this study. As outlined in the methodology section the measure of the child’s conscientiousness is attained through parental rating and maybe somewhat biased. That said all self-report measures are subject to criticism regarding subjectivity.

3.3 Strengths and Weaknesses of Research

In the opinion of the author of this study the use of the Connection to Nature Index was a particular research strength as it was suitable to both age groups surveyed with the age group recommended as 8-12 year olds (Cheng & Monroe, 2010; Bragg et. al, 2013). The analysis by dimensions including enjoyment of nature, empathy toward creatures, sense of oneness and sense of responsibility was informative and provided more relevant findings to the study. As a survey instrument the children found it easy to understand and suitable to their stage of cognitive development. In contrast the author noted that questions on the New Ecological Paradigm for Children (Manoli, Johnson, & Dunlap, 2007) created some ambiguity or confusion requiring clarification for the younger sample of children aged 8.5 and as such reflected a weakness in this study. As it is most suitable for use with 10-12 year olds one can conclude that as a tool it did not match the children’s stage of cognitive development very well.

3.4 Future Green-School Research

While this research examined the attitudes of a small sample in one green-school examining the intra-school attitudes it would be informative to gain inter-green-school research statistics of sixth class students aged 12 years old using the New Ecological Paradigm for Children and Connection to Nature. While this study added to addressing the
gap in the available research regarding environmental attitudes as opposed to environmental behaviour, a study comparing a green-school and non-green-schools in both an urban and rural locations would add significantly to the available research evidence available on the green-school programme, in order to support the statement made by An Taisce which prompted this research namely that “research carried out shows that the Green-Schools programme is having a very significant effect on environmental behavior and attitudes in Ireland” (An Taisce, 2009, p.5). Statistical evidence from this study was based on a middle-class student sample which was not ethnically mixed thereby highlighting a weakness of this research as a representative sample of the primary school going student population.

3.5 Application of Research Findings

On a practical note the implications of research findings suggest that connection to nature significantly predicts environmental behaviour therefore a practical application in the green-school environment to increase pro-environmental actions would be the inclusion of increased practical interaction with nature in the form of gardening, planting, school field trips to experience different natural environments, biodiversity and visits to farms and zoo’s to observe animals in their natural habitat. Research findings could also be applied to the design of school grounds to include adequate green spaces, trees and plants, ponds and wildlife where the children can sit during break times increasing their enjoyment of nature and sense of oneness with nature. Careful planning of educational activities to develop a sense of responsibility and empathy for nature for example water harvesting, composting, filling bird feeders, maintaining habitat for pond life need to include all children which is challenging given class sizes of 30 students.
In conclusion research conducted showed a positive correlation between connection to nature, environmental attitudes and parental attitudes with student attitudes, acquired in part as a result of the green-school programme being maintained from junior primary to senior primary school. Girls exhibited significantly higher levels of connection to nature in the areas of enjoyment of nature and empathy for nature. Promoting physical interaction with nature is a positive means of consolidating and increasing pro-environmental attitudes.
REFERENCES


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Retrieved from http://docs.lib.purdue.edu/dissertations/AAI9622738/


Appendix 1  QUESTIONNAIRES & CONSENT LETTER

PARENTS OF ______________________  TEACHER ______________________________

Here are some statements that may or may not describe your child. In the blank next to each statement, write the number that shows how much you agree or disagree that it describes your child. Write a 5 if you agree strongly, a 4 if you agree a little, a 3 if you neither agree nor disagree, a 2 if you disagree a little, or a 1 if you disagree strongly.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree strongly</td>
<td>Disagree a little</td>
<td>Neither agree nor disagree</td>
<td>Agree a little</td>
<td>Agree strongly</td>
</tr>
</tbody>
</table>

I see my child as someone who

1. ___Does things carefully and completely  6. ___Keeps working until things are done  
2. ___Can be somewhat careless  7. ___Does things efficiently (quickly and correctly)  
3. ___Is a reliable worker  8. ___Makes plans and sticks to them  
4. ___Tends to be disorganized  9. ___Is easily distracted; has trouble paying attention  
5. ___Tends to be lazy

6. New Ecological Paradigm

On a scale from 1 (strongly disagree) to 5 (strongly agree) as above, please indicate how much YOU agree or disagree with the following statements:

1. ______We are approaching the limit of the number of people the earth can support.  
2. ______Humans have the right to modify the natural environment to suit their needs.  
3. ______When humans interfere with nature it often produces disastrous consequences.  
4. ______Human ingenuity will insure that we do NOT make the earth unlivable.  
5. ______Humans are severely abusing the environment.  
6. ______The earth has plenty of natural resources if we just learn how to develop them.  
7. ______Plants and animals have as much right as humans to exist.  
8. ______The balance of nature is strong enough to cope with the impacts of modern industrial nations.  
9. ______Despite our special abilities humans are still subject to the laws of nature.  
10. ______The so-called “ecological crisis” facing humankind has been greatly exaggerated.  
11. ______The earth is like a spaceship with very limited room and resources.  
12. ______Humans were meant to rule over the rest of nature.  
13. ______The balance of nature is very delicate and easily upset.  
14. ______Humans will eventually learn enough about how nature works to be able to control it  
15. ____ If things continue on their present course, we will soon experience a major ecological catastrophe
## CONNECTION TO NATURE QUESTIONNAIRE FOR CHILDREN

Please tell us how much you agree or disagree with each of the following statements, by putting a tick in the relevant box.

<table>
<thead>
<tr>
<th>Statements</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I like to hear different sounds in nature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I like to see wild flowers in nature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. When I feel sad, I like to go outside and enjoy nature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Being in the natural environment makes me feel peaceful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I like to garden</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Collecting rocks and shells is fun</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I feel sad when wild animals are hurt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I like to see wild animals living in a clean environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I enjoy touching animals and plants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>10. Taking care of animals is important to me</td>
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<tr>
<td>11. Humans are part of the natural world</td>
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<tr>
<td>12. People cannot live without plants and animals</td>
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<td>13. Being outdoors makes me happy</td>
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<td>14. My actions will make the natural world different</td>
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<tr>
<td>15. Picking up trash on the ground can help the environment</td>
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<tr>
<td>16. People do not have the right to change the natural environment</td>
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</table>
NEW ECOLOGICAL PARADIGM QUESTIONNAIRE FOR CHILDREN

Please tell us how much you agree or disagree with each of the following statements, by putting a tick in the relevant box.

<table>
<thead>
<tr>
<th>Statements</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Plants and animals have as much right as people to live.</td>
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<td>2. There are too many (or almost too many) people on earth.</td>
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<td>3. People are clever enough to keep from ruining earth.</td>
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<td>4. People must obey the laws of nature.</td>
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<td>5. When people mess with nature it has bad results.</td>
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<tr>
<td>6. Nature is strong enough to handle the bad effects of our modern lifestyles</td>
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<td>7. People are supposed to rule over the rest of nature.</td>
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<td>8. People are treating nature badly.</td>
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<td>9. People will someday know enough about how nature works to be able to control it.</td>
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<tr>
<td>10. If things don’t change, we will have a big disaster in the environment soon.</td>
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</table>

Manoli, Johnson, & Dunlap (2007)
INFORMATION SHEET FOR PARENTS OF

Research Topic: Environmental attitudes and concerns of primary school children

Researcher: Margaret Daly, Student researcher,
Patricia Frazer, Supervisor,

Background and Purpose: St. Patrick's Junior and Senior School are currently participating, with over 90% of Irish Schools, in the environmental education Green-School programme co-ordinated by an Taisce and the Fingal County Council under 6 themes waste, energy, water, travel, biodiversity and global citizenship. Both schools have been awarded 4 and 3 flags respectively and are currently working toward their next green flag. Education for Sustainable Development through the Green-School programme aims to raise awareness, understanding and knowledge of our environment, promote the protection and conservation of our environment and encourage the personal development of young people through practical environmental projects. In my research I am interested in measuring the environmental concerns, pro-environmental attitudes and connection to nature of primary school children and their parents participating in the Green-School programme. This research will form part of my studies at DBS, and I am working with Dr. Patricia Frazer, whose contact details are included above.

What happens if my child takes part? I will be visiting your child's school during class time, at a time arranged with the principal. I will ask all children in the class to fill in two short questionnaires. They are standard questionnaires designed for children to explore their environmental concerns and connection to nature. . If you decide your child will not take part your child will be present in the classroom but will not fill in the questionnaires. They will be asked to read quietly while the others take part.

What will happen to the results of the study? The study’s results will be published in a postgraduate thesis. However at no point will any children be identifiable.

How will my child's information be protected? The children’s answers will remain confidential. When completing questionnaires, each child will be given an ID number. This will be used for any information relating to the study. The information which links names and numbers will be stored separately in a secure location in DBS until the research is completed. Once the study has been completed your child’s name will be removed and all the data will be destroyed after 10 years.

Voluntary Participation: Consent will be assumed unless the signed opt out form hereunder is returned by 3/3/14. Your child is free to withdraw at any time. I will remind the children of this when I meet them.

Further Information: This research is being conducted to assist researchers with finding out about children’s environmental world views. We very much hope that you will agree to let your child take part in the research. If you require any assistance or have any questions about the research study, please feel free to contact me.
Thank you very much for supporting this research study. Please keep this information for your records.

PARENT’S OPT-OUT FORM- PLEASE RETURN BY MONDAY 3\textsuperscript{RD} MARCH, 2014

Title of Study: Pro-environmental attitudes of primary school children.

Researcher: Margaret Daly, Student researcher, Patricia Frazer, Supervisor

<table>
<thead>
<tr>
<th>Parents Name: ____________________________</th>
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<tbody>
<tr>
<td>Child’s Name: ___________________________</td>
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</table>

I do not agree for my child to take part in the above study.

<table>
<thead>
<tr>
<th>Name of Parent (in block letters)</th>
<th>Date</th>
<th>Signature</th>
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