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From little acorns..: environmental action as a source of well-being for schoolchildren

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ABSTRACT

Pastoral care in education may take many forms but increasing emphasis on education for sustainable development (ESD) and concern about children's disconnection from nature suggests that our understanding of care should perhaps encompass the more than human world. The study described in this article examines longer term perspectives on well-being and looks at the possible benefits of environmental action for happiness and positive functioning. Considering the role of memory in the reconstruction of a past experience of tree planting, we suggest that well-being is constantly being reframed within the flux of life course and education. From survey responses and subsequent discussion groups in secondary schools exploring such memories, a deeper understanding of what well-being and connectedness to nature mean to young people within this case study is achieved. We note interdependencies between personal and planetary well-being within respondents' reflections and consider whether experiences of environmental action and its positioning as

an act of altruism for the greater good might provide a source of positive feelings for young people not only at the time, but through subsequent recollection.

Introduction

The natural environment has been acknowledged as a potential source of well-being (Groenewegen, van den Berg, de Vries, & Verheij, 2006; Pretty et al., 2005; White, Pahl, Ashbullby, Herbert, & Depledge, 2013; Wooley, Pattacini, & Somerset-Ward, 2009). However, most research focuses on immediate responses to assess the effects of nature for well-being and fewer studies have explored longer term effects. Here, we report on a study that revisited participation in the environmental action of tree planting to investigate any sustained, reshaped or emergent impacts, and consider temporal and developmental aspects of fostering well-being through nature. We focus in this article for Pastoral Care in Education on experiences of tree planting as a source of ecological well-being that acknowledges that feeling good is shaped by social, cultural and material influences (Brown & Kasser, 2005). We suggest that such outcomes are entwined and interdependent, and argue that even a small pro-sustainability action such as tree planting may have satisfying effects magnified by subsequent opportunities for recollection, reframing and recognition of the environmental altruism embedded within the activity. We propose that realignments of memories of tree planting in the context of present experiences and reflections provides material for constructing empathetic attitudes towards the more than human world and contribute to young people's sense of well-being.

Background context

The case study research explored below was undertaken as part of the Lottery-funded Good from Woods (GfW) project that aimed to increase capacity within the forest education and activity provision sector to undertake its own research. Eleven initiatives across South-West England partnered The Silvanus Trust and Plymouth University to co-produce robust evidence of the benefits of their work and share these with policy-makers, funders, researchers and service users. Volunteers and staff

within these projects took on a practitioner-research role and collected, analysed and reported information on who, what and where contribute to feeling good around trees and woodlands.

The concept of ‘well-being’ and indicators of its achievement were explored early in GfW, resulting in a framework for investigating dimensions of health and happiness that might be influenced by woodland experiences. It was co-developed with practitioner-researchers, drawing on early data and existing models of well-being (Abdallah, Steuer, Marks, & Page, 2008; Bragg, Wood, & Barton, 2013; Department for Communities & Local Government [DCLG], 2007; Department for Environment, Food & Rural Affairs [DEFRA], 2010; Mguni & Bacon, 2010; Nevill, 2009; Office for National Statistics [ONS], 2011). This outline framework provided a common reference point across disciplines and fields of practice (Good from Woods, 2015; Goodenough & Waite, 2011), proposing that time spent in woodlands might influence levels of satisfaction in five aspects of experience: psychological, physical, social, emotional and biophilic (connection to nature). Within each of these areas, specific moods or attitudes that might indicate an experience of well-being were described, such as ‘feeling confident/capable/purposeful’ or ‘socially supported/supportive of others’. This shared interpretation of indicators of well-being as expressions of health and happiness was deliberately broad and each practitioner-researcher was encouraged to critique and add to it. This refinement continued throughout the programme of studies as new data expanded conceptions of feeling good (hedonic well-being), positive functioning (eudaemonic well-being) and contributions towards them. Our intention was not to produce a definitive typology of woodland-based well-being, but to promote coherence and points of convergence within a very diverse evidence base (Good from Woods, 2015).

The particular case study explored within this article derives from The Woodland Trust’s participation in GfW. In 2012, when the research took place, it had supported the planting of 5.6 million trees through its Jubilee Woods project, 1.7 million of these planted with schools, youth groups and local communities (Woodland Trust, 2012, p. 2, 2015a). The Trust wanted to further their understanding of the cost-effectiveness and impact of programmes aimed at engaging schoolchildren in tree-planting activity.

Engagement of schoolchildren in tree planting is usually achieved by the Woodland Trust through tree planting ‘packs’ sent to participating schools (up to 420 saplings of various native species) and provision of supporting resources (Woodland Trust, 2015b). Trust staff have little direct contact with the planters and therefore limited information about the educational and sociocultural outcomes they might achieve during and following the experience. The Trust wished to explore the medium-to-long-term impacts of pupils’ engagement in tree-planting programmes through a retrospective investigation of young people’s memories of tree planting to augment their understanding of what participants felt they had got out of it and explore whether:

(1) Young people connected the experience with memories and feelings of well-being in the short or longer term.
(2) Previous tree planting was associated with their current concepts and behaviours around trees, woods and nature.

Literature

In the following sections, we explore how the literature around memory, altruism and connection to nature help us interpret our findings in this research.

Memory and reconstruction

Bradburn, Rips, and Shevell’s work (1987, p. 163) draws attention to the ‘cognitive limitations’ that affect detailed recall. When exploring the role of memory in answering autobiographical questions in surveys, they suggest that recall of the specifics within events will be diminished over time, with some research finding 20% of detail lost within a year, 60% forgotten within five. They propose that this loss of specifics varies in relation to the type of memory, so that recollection is easier when memories stand out as sufficiently different from others. Memories associated with emotion, of collective importance (such as a significant news event) or personally significant to the person recollecting, appear to be recalled more vividly (Bradburn et al., 1987). Within our study, young people’s tree-planting experiences were sometimes recalled over five years after the experience. It is therefore likely that the experience was considered unusual or significant by them. Michaelian (2011, p. 326),

argues that selective forgetting is an adaptive feature of memory, enabling storage of the knowledge most likely to be useful in the future and so salient memories can give insight into what this perceived 'utility' might be.

However, as has been widely recognised in research upon memory, reminiscence is also 'constructive' (Michaelian, 2011) and recollections may be augmented with details that do not appear in the original experience. This construction may take place both during processes associated with memorising and recall (Ibid.). Young people's memories of tree planting are thus selected and reconstructed through the lens of intermediate and current experiences (Michaelian, 2011).

The contextual aspects of elicited reconstruction in research prompt Keightley (2010, p. 66) to caution that there are methodological issues 'arising from the co-production and flexible inductive and intuitive analysis of memory data', and lead Pidgeon (1996) to ask whose 'truth' is being presented since researchers' expectations and interpretations are implicated. Michaelian (2011) also draws attention to the effect of retrospective bias, whereby recall is distorted to align memories with current beliefs and that furthermore, recall may project forwards into possible future usefulness in imagining the future (Buckner & Carroll, 2007). So, not all young people will necessarily remember tree planting if it did not have sufficient importance to them to be retained; and secondly, those who do remember will have modified or reconstructed the events at the point of experience, during the intervening period and during recall as part of meaning-making processes.

Gough (1999, p. 115) points out 'Although it is usual that we think of autobiographical accounts as memoirs rather than anticipations, such an attribution of experience to either the past or the future is temporal reductionism'. He notes that memory also provides a clue to what one wishes to be and that this may be shaped by the utility of the memory, which of course may change throughout an individual's life course and within different sociocultural and material contexts. Moreover, Waite (2007, pp. 334–335) argues that

> although some researchers (Borrie & Roggenbuck, 1995) express concern that reconstructive processes pose problems for valid and reliable evaluation of outdoor experiences, it could equally be argued that it is precisely these evolving understandings which make memories and learning important

> and influential for our present and future actions (Neisser, 1988). Furthermore, the 'new' memories are not necessarily purely cognitive 'post hoc rationalizations' (Borrie & Roggenbuck, 1995, p. 2) but are also likely to involve post hoc affective response, signalling continuing cognitive and emotional 'relevance' for individuals. (Tarrant, 1996)

This temporal and affective complexity indicates that a simplistic historical view of memory studies will seriously undermine the value of the data generated by this method.

Chawla (1995) describes the importance of constructive memory in relation to place within the concept of 'environmental autobiography'. She draws attention to the way in which we adapt our memories of our affective connection with particular environments towards creation of a coherent narrative. A consistent account helps position our experience in relation to others and the wider context of human experience, helping to reaffirm our particular place in the human community (Ibid.).

Altruism and motivations for action

We might therefore anticipate that memories of environmental action are reconstructed and motivations for engaging in such activity are reframed. Batson and Shaw (1991) challenge a long-standing idea that altruistic behaviour is only driven by self-interest, finding evidence for a pluralistic model of pro-social thinking and in particular support for a link between empathy and altruism. Vicarious emotions such as empathy evoked in an individual by another person's situation can motivate actions (ibid.). However, Taylor, Pacini-Ketchabaw, and Blaise (2012, p. 82) suggest that this empathy should extend beyond the human to the more than human world, pointing to the 'agentic relations between the material and semiotic worlds by refocusing upon the mutually constitutive and generative relationship between matter (including all manner of nonhuman things) and (human) meaning'. Fredrickson (2003, p. 333) contends that:

> Savoring an experience solidifies life priorities; altruistic acts strengthen social ties and build skills for expressing love and care. These outcomes often endure long after the initial positive emotion has vanished. […] So, by creating chains of events that carry positive meaning for others, positive emotions can trigger upward spirals that transform communities into more cohesive, moral and harmonious social organizations.

This sort of ‘knock-on’ effect for altruistic actions may explain how reframing immediate emotions after the event can engender new feelings of wider satisfaction associated with caring.

The domains in which people strive for a sense of meaning that Emmons (2003) proposes are: achievement/work; relationships/intimacy, including being altruistic and helpful; religion/spirituality; and transcendence/generativity which involves contributing to society, leaving a legacy and transcending self-interests. While he suggests that ‘a wise person knows which goals are ultimately fulfilling and which offer only the illusion of fulfilment and thus will order his or her life accordingly’ (p. 123), we would argue that this ‘wisdom’ may only be apparent in the light of further experience and new sociocultural contexts that reshape past, present and future in reconstructed memories.

Well-being and nature

Indeed, a focus on individual goals and a planned achievement of them appears seriously to constrain our capacity to understand how drivers and enactments may overlap and interact over time. Cieslik (2015) suggests that too much attention is given to individualised notions of well-being, such as happiness as ‘good feeling’. He argues that widely adopted subjective assessments of well-being are rooted in the social structures that enable or constrain actors, and that qualitative and biographical research methodologies can better explore happiness as a social process involving struggle and negotiation in everyday life. These struggles continue after experiences and shape them as they are recalled.

Lohr’s (2007) research demonstrates an association between active interaction with trees as children and more positive attitudes towards trees as adults. How this relationship is mediated is not yet known, but Corral-Verdugo, Mireles-Acosta, Tapia-Fonllem, and Fraijo-Sing (2011) claim that there is an association between happiness and sustainably oriented behaviour. Their research indicates that ‘a sustainably-oriented person is not pro-ecological *or* pro-social, but pro-ecological *and* pro-social (simultaneously)’ (Corral-Verdugo et al., 2011, p. 96). Furthermore, they emphasise that in addition to antecedents such as environmental knowledge, personal values and ecological beliefs, the

repercussions of environmental action are crucial in determining future environmental behaviour. The mechanism for this effect, they suggest, is through behaviour modification and positive reinforcement. However, another explanation might be the reframing of memories within subsequent ongoing experiences as discussed earlier. Enjoyment of environmental action might be reinterpreted in the light of new experiences and knowledge acquired after the event.

Some support for this latter account can be seen in the work of Cervinka, Roderer, and Hefler (2012). They found indicators of well-being were correlated with connectedness to nature, particularly 'meaningfulness'. People scoring high on meaningfulness, regardless of their material circumstances, tend to view their lives as fulfilling and feel less powerless, helpless, fearful or depressed. They also feel connected to and accepted by others. It may be that it is the repositioning of an environmental action as meaningful and significant rather than merely a source of 'fun' that links feelings of well-being *and* connection to nature. Although the direction of the association is not known, it would seem that happiness and environmental action often go hand in hand.

Kellert (2002) offers an alternative theory for values in nature, positing a developmental progression. Developing Kellert's model and suggesting innate and learned aspects, Davis, Rea, and Waite (2006) argue that rather than moralistic (spiritual reverence and ethical concern for nature) and naturalistic (direct experience and exploration of nature) only emerging at adolescence, these are innate and appear at a much earlier life stage, but that utilitarian (practical and material exploitation of nature) is learned, occurring later. However, as we noted earlier, cultural and material contexts inevitably modify how innate developmental dispositions play out.

Gaesser (2012, p. 1) suggests that memory, imagination and empathy all have a role to play in stimulating 'pro-social intentions and behaviour'. The author suggests that the ability to realistically imagine future scenarios of providing care, supported by constructive memories, may belie actual altruistic actions and attitudes. Gaesser (2012) refers to the diverse literature linking these spheres, but acknowledges that many questions remain and require further research. In this article, we present data that seem to suggest that feelings and memories attached to tree-planting activity may shift over time, allowing reinterpretations of its value as an altruistic action.

Sample

In order to ensure that a significant proportion of participants within the research would have had access to involvement in a Woodland Trust planting project, the sample was purposively constructed. The area of Cornwall in South-West England selected, Restormel, had 8 secondary schools attended by some of the 1500 schoolchildren who had participated in Woodland Trust tree planting in a disused china clay quarry over 4 consecutive planting seasons, 4 or more years prior to the research (Morgan, 2008).

Demographically, the area ranked 93rd most deprived out of 354 authorities in the UK Government's Index of Multiple Deprivation (IMD) 2004. The local population ethnicity is 99% white. A strategic investment framework for the local area has stimulated various regeneration schemes in recent years, including environmental projects[1].

The Woodland Trust introduced the research project to all eight schools and four of them agreed to participate. From these schools, a total of 113 young people responded to a survey, 49[2] males (11–15) and 62[3] females (11–16), and 2 respondents whose age and gender were not provided. Eighteen students at 3 of these schools then took part in follow-up discussion groups (12 males and 6 females, 11–15[4]). Establishing the age at which tree planting occurred (in relation to the age at which it was being recalled) within this sample would have aided analysis of associations between knowledge acquisition, developmental stage and interpretations of the significance of tree planting. However, young people's reminiscences rarely included specific dates or age references, and memory, as explored above, makes reliance on such detail uncertain.

Research methods

The research had three stages:

(1) establishing the Woodland Trust's expectations of the outcomes of their school

tree-planting programme via interview;

(2) developing, piloting and administering an electronic survey to pupils to establish their memories of and current attitudes towards tree planting;

(3) pupil discussion groups to enrich the data and clarify and confirm developing interpretations.

The Head of People Engagement at the Woodland Trust was interviewed to establish stakeholders' anticipated outcomes from tree planting with young people and inform the design of the initial survey to pupils.

A survey was then co-designed in collaboration with the Woodland Trust and delivered to each of the four schools, either on paper or using a simple website as an access point for students. The survey was designed to take 5–10 min to complete and was undertaken during lessons that schools felt might benefit from students' engagement within the research (Information and Communication Technology or Personal Social and Health Education sessions). Individual teachers and students were free to choose whether to use or complete the survey. Its purpose, data protection, anonymity of responses and what would happen to information shared were made clear beforehand, including that participation was entirely optional and that consent for use of their contribution could be withdrawn up to a week following involvement. Students were asked to confirm their understanding of the above and consent if they wished to take part. The ethics approach and materials were approved by the Education Research ethics committee at Plymouth University and by the Woodland Trust.

The survey also provided the means of inviting young people to participate in discussion groups. Each school determined when and where these took place and how they reminded pupils of them (materials were provided for this purpose). Perhaps predictably, attendance during a timetabled lesson (one school's approach) was significantly more popular than participation during the lunch break (other schools' approach). In accordance with the agreed ethics procedure, teachers sent an information and consent letter home.

The discussion provided a forum for participants' expression of how tree planting might be linked to emotional and attitudinal developments. Particularly with smaller groups, facilitators were able to support young peoples' discussion of themes that were meaningful, relevant and emotive to them, whereas the material or educational benefits of planting were discussed with relative ease; younger students sometimes struggled to articulate more personal aspects of the tree-planting experience. Generally, there was less inhibited opinion sharing in discussion groups with older pupils, suggesting that the way in which well-being is subjectively experienced, contextualised, recalled and understood is related to current context, life stage, knowledge and experience.

Analysis

The stakeholder interview data were content analysed to identify the key well-being outcomes that the Woodland Trust expected to result from tree planting. Survey data were analysed to explore correlations between remembered tree planting experiences and current attitudes towards tree-planting and time spent in woodland. χ_2 tests were used to determine statistical significance. Initial findings from the surveys were then raised in the discussion groups, seeking confirmation, amendment and expansion by young people.

The two practitioner-researchers interpolated close reading of group discussion transcripts and quantitative analysis of the survey results to identify and explore the emergent themes, examining and questioning their relationship to the GfW framework. The researchers compared their individual coding and explored differences and uncertainties in order to test the validity of their interpretations. Initial analyses and evidence for interpretations were also shared with the GfW project researcher, who helped relate evidence to that emerging across the project.

Findings

Memories of tree planting – depth and resilience

Survey respondents were asked to share any memories of planting a tree and prompted to describe where, when and why the tree was planted or whatever else they could recall about such experiences

(Figure 1). Thirty-six young people provided brief descriptions of single-detail memories (such as location), with 23 providing some further detail. Most descriptions focused on either planting location (primary school *n* = 10; garden *n* = 8; china clay site *n* = 3; cubs *n* = 1; and farm *n* = 1), or people leading or undertaking planting (primary school staff *n* = 14; family *n* = 5; specialist facilitator *n* = 3; and cubs *n* = 1). Few described personal outcomes of planting.

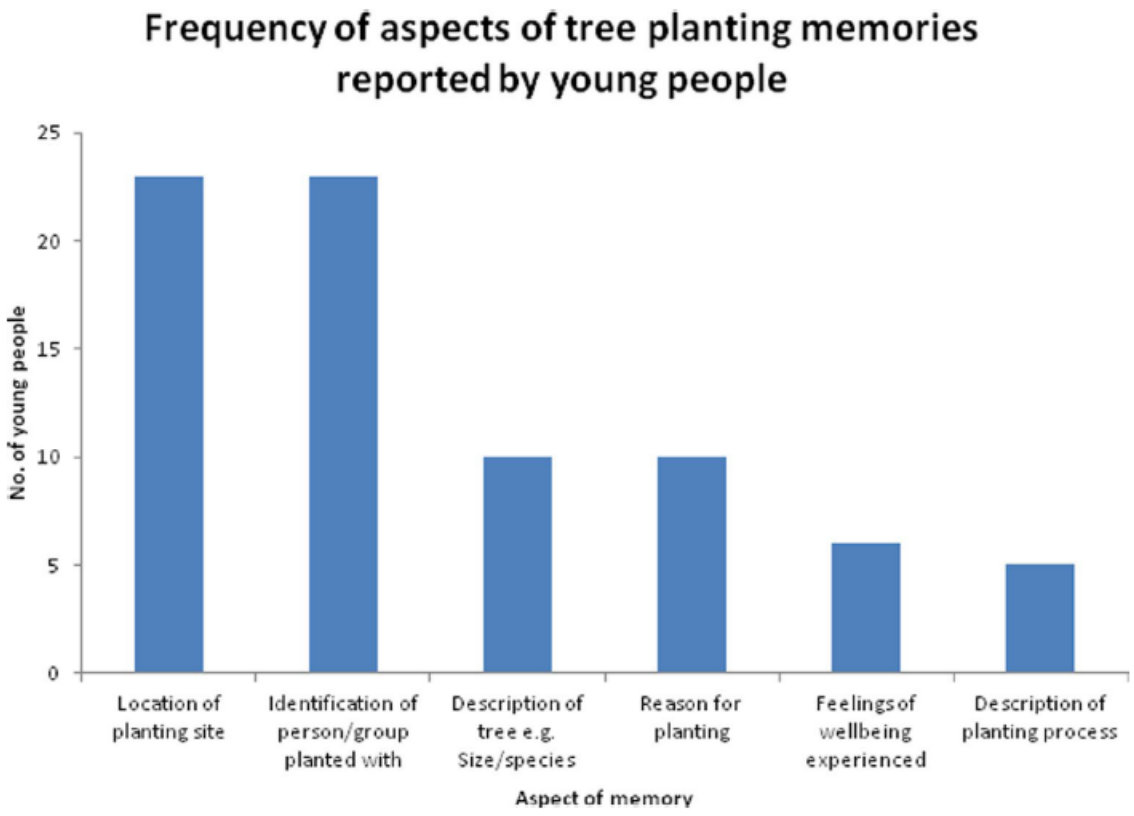

Figure 1 Memories of tree planting.

> Well when I was in my old school we had an old man come in and he planted them with us. We planted different trees each week we did it for about an hour each week and it was loads of fun but it was very hard but a lot of fun. I can't remember why we did it but it was really fun!

The primary school and home were a dominant source of memories, featuring much more prominently than other contexts, indicating that school and family settings may play an important role in promoting tree planting as pro-sustainability behaviour.

Some (*n* = 10) described the trees planted, including mentions of size and species. Some planted seeds and mentioned that it was a conker or an acorn, but most references to the 'tree' were generic. A few (*n* = 5) included something about the planting process in their memory: 'you put it in the ground and cover it up again', '… we all worked in pairs and planted a tree'.

Survey respondents describing their motivations for tree planting (*n* = 10) mentioned: improving aesthetics; developing green space; memorialisation of a pet or person; commemoration of an event; and for pleasure. Seventeen per cent of participants (*n* = 6) referred to enjoyment: 'it was so much fun having everyone helping and having a good time, and it is also helping the ecosystem' and '… it's so awesome knowing that you can communicate and have fun instead of work, work, work, all the time'.

Memories of tree planting reported within the survey largely lacked the sensory or material detail that might be associated with the practical dimensions of tree planting: smells, colours, sounds and tactile, substantive events. However, social (who led the event and how it was cooperatively achieved), cultural (how or why to plant trees), temporal (when and for how long) and geographical (where) details were recollected. Personal affective contexts formed part of the recalled events less frequently. This may be due partially to the question format and time constraints of completing the digital survey, but it is also a pattern that was associated with initial recall of tree-planting experiences within the discussion groups: 'I planted an acorn once but I haven't been back to it with my parents'; 'Planted a tree with my school at a clay pit' 'What do you remember about the day?' 'We got a free hat'.

Respondents' initial memories of tree planting do not tend to include the sensory, immersive connections with the natural world sometimes articulated by children when interviewed about learning in nature (Waite, 2007), although opportunities for such engagements can motivate adults in providing outdoor activities for children (Goodenough, Waite, & Bartlett, 2015), neither are they elegiac reminiscences that often appear in adult memoirs of childhood encounters with nature (Waite, 2007). Highlighting this difference does not mean that young tree planters did not have embodied, engrossing encounters with the natural world nor that these students will not recollect them in more emotive terms in the future. One reason why early responses were so brief and factual may be that

young people could not determine their relevance (Mahon, Glendinning, Clarke, & Craig, 1996; Matthews, Limb, & Taylor, 1998; Nespor, 1998). It is possible that lacking a personally resonant context for recall and reconstruction, the bare facts were recounted (in contrast to more emotive recollections that would emerge following longer discussion, discussed below); in other words, recollection of 'memories' of engagement with nature and its associations with well-being is situated (Michaelian, 2011).

Simple recollection of planting by many students was a significant outcome for the Woodland Trust. Fifty-five per cent of respondents indicated they could remember planting a tree when younger. The percentage of tree planters remembering may exceed this figure as we do not have information about how many respondents had actually planted trees. Sixty-nine per cent of those remembering could report where and 58% recalled the planting experience in greater depth (whom, what or why). If forgetting enables us to store significant details and recall those that will best serve us in the future, the fact that tree planting was retained suggests that it was perceived an event worth memorising as a potential future resource (Bradburn et al., 1987; Michaelian, 2011).

The significance of tree-planting memories

The survey asked questions to establish what young people felt the significance of tree planting was for them, other young people and in general. This was explored further in the discussion groups. Asked 'In what ways do you think young people might benefit from planting trees?', 'connection with nature' was the option most commonly selected. Within the discussion groups, it became evident that this term was interpreted in various ways. For some, it denoted a material or emotional interaction with animals and the environment: 'Your mind's more open to what's out there and your emotions are much happier when you're with them … Animals'. Others felt that a connection with nature could be established through increases in knowledge and understanding of natural world processes and its requirements to thrive: 'Understanding more of how it works and how to protect it'; '… being close to nature is doing anything that helps it and learning more about it – yeah'. As above, the sense that taking care of the natural world was an experience of connection was particularly significant for some: 'Sort of like – like you're benefitting to the animals like helping them out to get a long life a lot more';

‘Yeah cos like we use a lot of trees for paper and that, it’s [planting a tree] like giving something back’ (Figure 2).

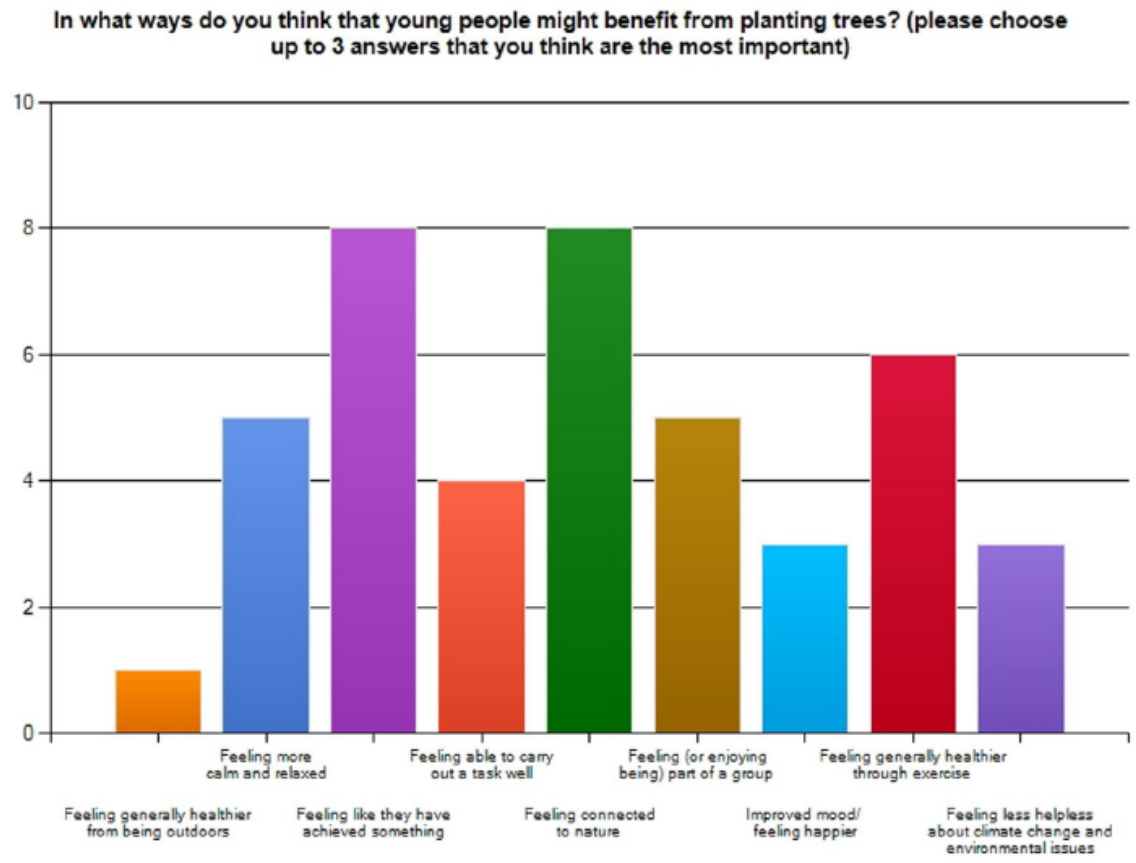

Figure 2 How young people benefit from planting trees.

Survey responses and comments in discussion indicated that tree planting was strongly associated by young people with their relationship to the more than human world. The character of the human–nature interaction associated with tree planting’s role in ‘nature connection’ was diverse; perhaps underscoring that connection to the natural world – our narrative of our place within nature or ‘environmental autobiography’ (Chawla, 1995) – is articulated in relation to our current life stage, knowledge and context (Gough, 1999). However, both planters and non-planters strongly anticipated that tree planting could benefit young people by bringing them into relation with nature, and considered this to be its most significant outcome.

In terms of tree planting's impact on mood and satisfaction, 'feeling more calm and relaxed' was the fifth most important outcome of tree planting for young people on aggregate. However, variation emerged when the results were broken down according to tree-planting experience. While this was the most popular benefit of tree planting for those who had not planted a tree (58% of non-tree-planting respondents), only 21% of those who had previously planted a tree selected this option. This highlights a potential mismatch between expectations and experiences or perhaps greater salience of altruistic benefits for those taking this pro-environmental action. Yet, the benefit of experiencing yourself in relation to the natural world was an important outcome for both those anticipating impacts and those with experience of them (Figure 3).

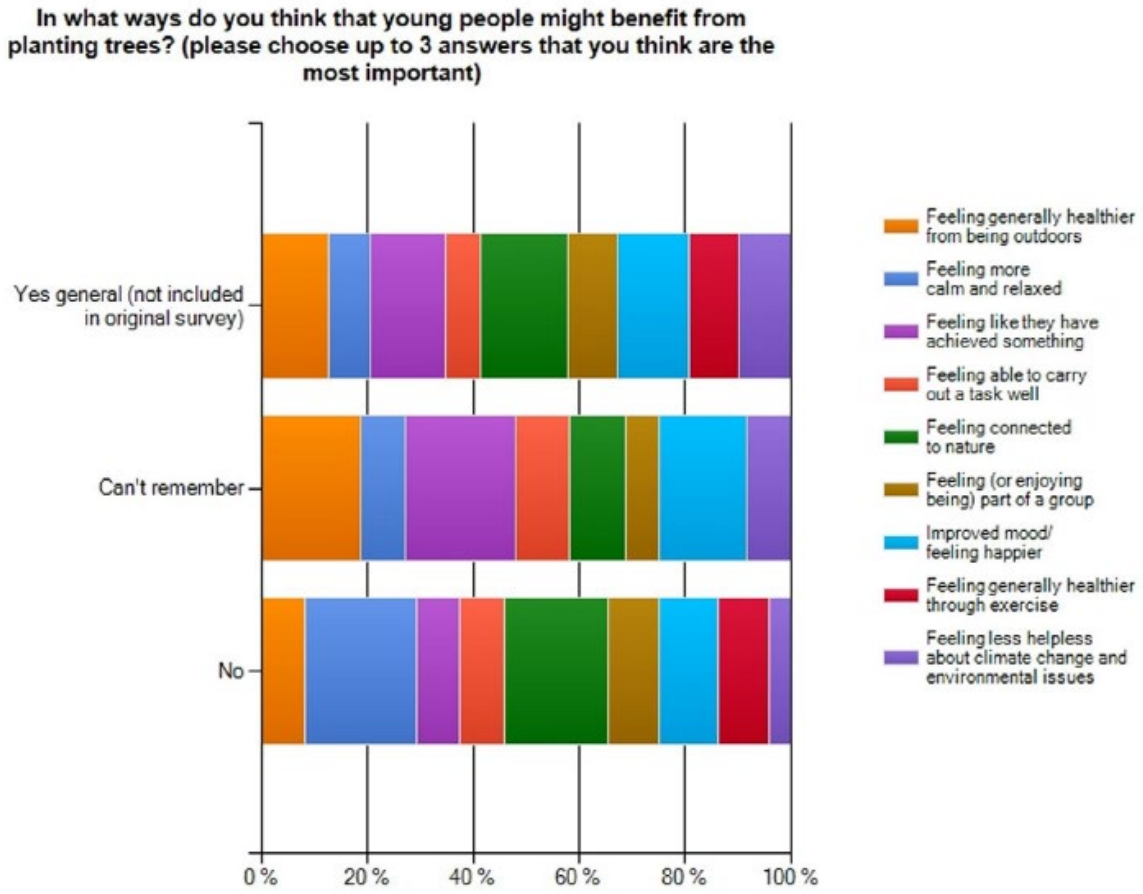

Figure 3 Comparison of tree planters, non-planters and associated benefits.

A difference between planters and non-planters was similarly evident when young people were asked about the importance of tree planting. Forty-eight per cent of tree planter participants responded 'Yes, very important' when asked 'Do you think it is important to plant trees? compared to 27% of those

who had not. This result may suggest that providing tree-planting experience to young people could be a valuable method of engendering greater pro-sustainability attitudes and future behaviour. In this study, it seems that planting a tree may dispose young people towards a belief that such an action is significant or meaningful.

We probed whether participation in tree planting impacted how young people interpreted its worth as a pro-environmental or pro-social behaviour: 'Why do you think it is important to plant trees?' 79.8% of respondents chose 'To provide habitats for animals, birds and plants' as one of their three top reasons, significantly higher than other available options, regardless of whether they had previously planted a tree or not. The second most popular choice was 'to create healthier environments for people' which was selected by 44.9% of respondents (Figure 4).

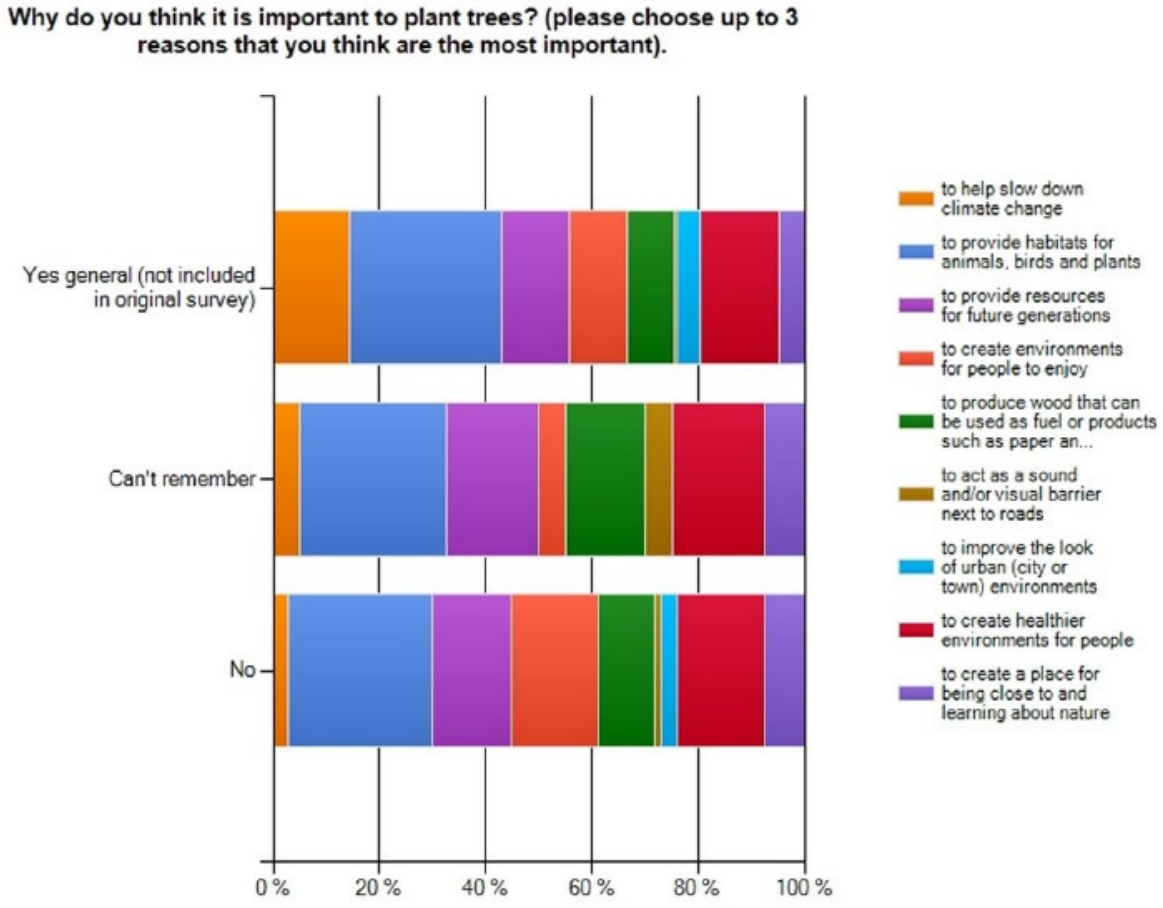

Figure 4 Why is it important to plant trees?

During discussion, those who had planted trees corroborated that this was a positive action for sustainability that helped them feel good. However, the association of their memory of tree planting with such benefits appeared to be made at different times. A few discussion group participants expressed memories of tree planting as knowing they had taken a pro-sustainability action and felt good about it.

> ‘A good experience to plant that tree’. ‘… What was good about the experience, is there anything in particular that you thought “oh that was particularly fun” or..?’ ‘No, like helping the environment when you’re doing it’.

> I planted trees with [primary] school when I was eight, and like I don’t really feel embarrassed cos I know I was like helping the environment.

> Well, I was sort of just, I just sort of like thought [when planting the tree] it could just be like a future tree later on and just kind of have lots of animals inhabiting it.

In the two latter instances, participants went on to recall the emotions associated with memory of their action on behalf of nature, reporting feeling a sense of ease and purposefulness and a ‘sort of warm glow’.

In these instances, memories are recalled or perhaps reconstructed that find a sense of well-being to be contiguous with the action of tree planting, derived from the belief that it benefits people and planet. It is possible that such memories acknowledge original experience, but also that this has been reconstructed with increased relevance to these students’ current experiences and actions (Neisser, 1988; Tarrant, 1996). Tree planting as a recollected activity is perhaps particularly malleable. The planter above, for example, recalls feeling good about ‘a future tree’, which fully grown could support a wide range of fauna. The memory of tree planting is temporally stretched to include a projected future (Gough, 1999). Planters may imagine the life of their future tree (biodiversity in mature specimens, its contribution to oxygen production and its potential utility harvested or left to grow) and potentially measure some of the worth of their intervention on this basis (Davis et al., 2006). It is interesting to speculate whether taking nature’s perspective helps stimulate pro-social attitudes

towards the more than human world. Does the memory of planting a tree help contribute more vivid material towards constructing and empathising with such a perspective (Gaesser, 2012)? Such empathetic scenarios emerged during discussion around the potential competition between human resource requirements and those of other species.

> I think that if it's a tree for an animal then it's its home but a tree wouldn't be like our home, it would be like used for fuel or building or something like that.

> … just the feeling like you know you said the resources [to provide resources for future generations] if it [a tree] didn't end up growing that big they [humans] would use it in like a day and animals would just stay there and just make it their home.

For most, contemporaneous details of past tree planting appeared more prosaic, akin to those recorded within the survey. However, contrastingly, present feelings about that action and its connotations were more meaningful and resonant, having shifted over time (Michaelian, 2011).

> Can you remember anything about how you felt when you were planting trees; was there any sort of thing that stood out for you? 'Not at the time … Just know it was more important now than it was then'. 'So you've realised that what you did had some kind of use and importance that you weren't aware of before then?' 'Yep … it was like two years ago'.

> It was on a school trip where we went in a group and just went into the woods it was in primary school and we just planted trees around the area, at the time it didn't feel like it was important, but as I grew up I knew that it was kind of helping the environment and it was important so … because I kind of needed to be more aware of the environment and planting more trees and help the environment and things.

Some pupils suggested that the act of planting had in fact gathered a sense of purpose in the context of recent school-based learning.

> Well at the time it was in primary and it had no real effect on me because obviously at that age you don't really think about those type of things. But like now in science and you learn about all this stuff and habitats and that you think so you've like a good deed by helping the environment and that

These students acknowledged that recollection of their action now took place within a different context and has undergone a ‘post hoc rationalisation’ (Borrie & Roggenbuck, 1995; Waite, 2007). An increase in age and understanding had supplied some with new interpretations of the meaning of tree planting and the significance of their role within it.

For others, engagement in the research appeared to catalyse a connection between their tree-planting memories and developing understandings of the natural world.

> ‘Planting trees is like important for our environment because like we need oxygen from them to live …’ ‘Makes habitats …’ ‘OK. Thank you and do you think maybe discussing that has helped you think about that or is it something that you think about anyway?’ ‘Like discussing it has made me realise how important it is’

> I didn’t really think about it [before the discussion], I just thought well if another acorn falls off another acorn tree is going to get buried sometime but [pause], it’s important that you do it yourself as well.

> ‘And can you remember anything about your feelings on that day; did you feel any different to other days at school?’ ‘Yeah, just sort of like I was making a difference to just like sort of, making it like happier sort of …’ ‘… do you remember how old you were when you planted that tree?’ ‘I think seven. I don’t really think about it that often – just – you know [the survey] just jogged my memory a bit more’.

A third way of reconstructing tree-planting memories in relation to benefits to the natural world and feeling good seems to be stimulated by the research process and its prompts. This could be interpreted that questioning led young people to answers that they thought adults would want to hear – a ‘Hawthorne’ effect. However, prompted reconstructions of their tree-planting experience also offer glimpses into the process by which young people actively create coherent ‘environmental autobiography’, a personal narrative of relation to the natural world (Chawla, 1995; Fredrickson, 2003).

Self-transcendent purposefulness

Many of the good feelings that young people reported or anticipated seem to describe the possibility of achieving positive emotional moods via altruistic action (Emmons, 2003). Acting in the interests of the natural world, feeling purposeful on behalf of humankind, and transcending one's immediate needs on behalf of the future, seemed to provide opportunities to access happy, confident feelings.

'Feeling like they have achieved something' was young people's second most selected benefit from tree planting. In discussion, it emerged that a sense of achievement for tree planters was entwined with self-transcending motivations (Emmons, 2003). 'Feeling able to carry out a task well' was selected far less, reinforcing the sense that feeling good was connected with altruistic activity rather than personal goals.

> '… is there anything that you imagine you would get out of tree planting if you did do it?' 'Helping others.' 'So you think helping others is a kind of benefit to you as well, that you've been able to help others?' 'Yeah'.

> '[Tree planting] Might make us like a nicer person?' 'OK, that's really interesting actually, so you think it has an impact on your sort of personality potentially?' 'Yeah'.

Feelings of self-transcending purposefulness through tree planting were particularly evident in relation to issues of climate change and habitat loss. Young people described a lack of opportunities for their age group to influence issues they considered legacies of older generations, a lack of control bound to their life stage and position within society.

> I reckon it's unfair like cos like when we were like not born like other people were making it worse like, like global warming and we're like our children and that's got to take the like effect of it by other people.

> It's sort of like a war basically. When there's a war, and after the war, the ones that suffer are the kids that are born, and they don't have anything to do with it and yet they suffer.

> ‘[Tree planting] Makes it like more fair to other people … Because like people are chopping down trees at the moment and like we need trees to breathe our oxygen and they won’t have a chance to like live long if we have no oxygen’. ‘It’s cos they don’t care’ ‘It’s like with animals as well’

Self-transcendent actions appeared to become of increased significance to some individuals as their understanding of the purpose of their action became clearer in the light of new or additional knowledge. Similarly, these altered insights, through conferring increased importance on the action of tree planting, possibly also enhance the sense of well-being obtainable from their ‘good deed’. Thus, the memory of planting a tree, of taking a pro-sustainability action in the past, could provide a source of well-being when recalled in later years. Factors contributing towards this reconstruction of the action could include developing understanding of the action in the light of new experience and knowledge, its shifting meaning (Cervinka et al., 2012) and growing awareness of personal and collective agencies and their limits.

> You’re helping the world like have oxygen or something like that … [tree planting could] make you feel kind of successful cos you’re making a difference to climate change

> It feels quite good to feel that like – if you’re like making more habitats for animals then like less animals will be extinct …

> You feel like you’re helping animals than just watching other people doing it.

> It [tree planting] would make you feel you had some part in helping with the whole environment – kind of. You just know that you’ve done your part and you felt – I don’t know – just something.

Recalling tree planting appeared to enable some young people to reconstruct their sense of themselves in relation to the human and more than human world, in the light of their developing understanding. Their narratives appeared to endorse their investment of caring attitudes towards ecological communities and perhaps contributed to their sense of purposefulness in relation to threats perceived as inequitable and difficult to influence from their position in society (Cervinka et al., 2012; Chawla, 1995). This sense of meaning and purpose, particularly in relation to ‘environment’ (climate change, habitat and species loss), in turn may play a role in young people feeling good about planting

trees long after the activity itself (Cieslik, 2015). In line with some of Fredrickson's contentions about altruistic activity (2003), revisiting the experience of tree planting appeared to help resource a sense of connectedness and affix importance to expressions of nurture.

It is worth noting however that, for some participants, recollection might reduce their sense of well-being in the light of developing comprehension. Students reported strong emotions around climate change and habitat loss in particular, 'all man's achievements are for nothing', and whilst tree-planting memories were sometimes reconstructed to help address such feelings, they could also reinforce pessimism about small actions in the context of new knowledge.

> Cos it (tree planting) make you feel more guilty by, if you hear about global warming it can make you feel more guilty, having the fact that you've done something but you can't stop like what's happening to global warming.

However, overall, the initial survey showed a statistically significant[5] relationship between having planted a tree and believing that tree planting could help address climate change. Twenty-seven per cent of all respondents selected the reason 'to help slow down climate change' as one of their chosen responses. When examining this data in more depth, it emerged that young people who had previously planted a tree were four times more likely to select 'to help slow down climate change' as a reason to plant trees (40% selected this reason) than those who hadn't (10%) or couldn't remember previously planting a tree (11%). Given students' increased knowledge of the ecosystem services provided by trees and climate change processes during their secondary school experience, it may be that tree planters had reworked their engagement in tree planting in relation to climate change (with the potential to derive the sense of feeling good, purpose and control described above), prior to or on survey completion. Over time, the meaning and personal benefits of tree planting may have the potential to alter and expand in relation to students' developing understanding of the more than human world.

Concluding thoughts

Pastoral care in education often focuses on the individual, but this study suggests that a wider frame can be useful to take account of subjective well-being's reliance on structural, cultural and material circumstances. The way in which young people recalled memories of tree planting and acknowledged the process of reconstructing them poses interesting questions about the extent to which interventions aimed at increasing young people's pro-environmental dispositions or sense of well-being should be designed to provide opportunities to revisit memories in the light of new knowledge and experiences. This association suggests that citizen science and other forms of environmental action during schooling might be enhanced through appreciation of how such activity may be recollected and reframed (including consideration of what prompts empathetic, emotive reconstructions of its significance and the possible function of such recall in constructing a personal narrative of pro-sustainability behaviour) and exploration of whether reminiscence over such actions might help counteract feelings of helplessness, possibly engendered by some aspects of environmental education.

Within this study, most young people with tree-planting memories appeared to position themselves in positive relation to the wider world and feel connected with the more than human world. They derived personal well-being from acting altruistically for humans and nature by planting a tree, in addition to enjoyable social interactions experienced at the time, demonstrating an ecological sense of well-being that acknowledges interdependence with others including nature. Both those who had or had not planted a tree anticipated that positive benefits would be available to young tree planters from that activity, but the ability to reconstruct meaning from memories associated with tree planting may help explain why 48% of planters found it to be a very 'important' thing to do compared with only 27% of non-planters. For those who had planted a tree, its meaning could be recalled and recast, providing a continuing resource for feeling a valuable contributor to the human and more than human world.

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[1] It was noted during the sample selection stage that 'The Eden project' was the second largest local employer in the research area and well known regionally. The potential impact of this on local awareness of global environmental issues, particularly in school age children who may have engaged with Eden's education outreach programmes was acknowledged as a potential variable within findings. Also considered was the fact that all four schools included in the sample had previously requested a higher than average number of tree planting packs from the Woodland Trust. This may indicate that a stronger than average programme of environmental education and/or learning in natural environments was established within these participating schools. Participants may therefore have been more predisposed towards tree planting and environmental education than is typical of their age.

[2] 11 years = *n*2, 12 years = *n*21, 13 years = *n*13, 15 years = *n*12.

[3] 11 years = *n*9, 12 years = *n*19, 13 years = *n*16, 14 years = *n*2, 15 years = *n*15, 16 years = *n*1.

[4] Males, 15 years = *n*5, 12–13 years = *n*7, Females, 12–13 years = *n*6.

[5] χ_2 test producing a p value of 0.02.

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