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# Social capital and improved wellbeing: a qualitative investigation of the Wild Things! Silver Saplings Adventures programme in rural North-East Scotland.

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## ***Social Capital and Improved Wellbeing: A Qualitative Investigation of the Wild Things! Silver Saplings Adventures Programme in Rural North-East Scotland***

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### **ABSTRACT**

The Silver Saplings Adventures Programme (SSAP), run by Wild Things! charity in Scotland, enhances older adults' wellbeing through nature-based activities, lifelong learning, and social cohesion. This study evaluates SSAP's 2023 impact using remote interviews with 17 participants, revealing its role in fostering physical, social, and mental wellbeing. A key finding is SSAP's effectiveness in strengthening social capital, helping mitigate aging-related social decline. Participants reported forming friendships and stronger community ties. The study highlights SSAP's value in promoting healthy aging and resilience, advocating for further support and expansion of nature programmes to enrich older populations in Scotland and beyond.

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Social capital; nature-based intervention; greenspace; silver saplings; wellbeing

## **Introduction**

This study represents an examination and structured evaluation of the *Silver Saplings: Adventures for Older Adults Programme* (SSAP), a flagship initiative of the Wild Things! Charity operating across Moray, Aberdeenshire, and the Highlands of Scotland. SSAP is structured around a profound commitment to enhancing the wellbeing and social connections of older adults through immersive nature-based activities. SSAP promotes social cohesion, and fostering ongoing learning opportunities. A central aim of this research was to develop a theoretical framework to better understand the role of nature-based interventions in shaping social capital (SC) among older adults. By integrating insights from participants' experiences with SC theory, we propose an analytical tool that captures the complex interplay between wellbeing, community engagement, and lifelong learning in natural settings: the *modulated social capital framework*. This tool provides a structured approach to

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evaluating similar programmes and offers a foundation for future research in the field of social and environmental interventions.

### ***Wild Things!***

The Wild Things! charity (WT), established in 2003, has emerged as a prominent Scottish environmental education charity dedicated to fostering deep connections between individuals and their local natural environments. WT's overarching mission extends beyond education to include conservation efforts, habitat restoration projects – such as the rewilding of the River Findhorn – and a diverse array of educational programmes spanning from engagements with schools to multiple community-based initiatives. These efforts collectively aim to engage people of all ages, including those often marginalized or vulnerable in society, in meaningful interactions with nature (Wild Things, 2024a).

WT's SSAP specifically targets older adults who may face barriers to participating in outdoor activities due to social isolation, limited mobility, transportation challenges, and health concerns. Structured over a 12-month “cycle” period with monthly day trips, SSAP offers participants opportunities to explore diverse natural settings, such as beaches, woodlands, and riversides. Activities include hands-on-experiences like rock pooling, pond dipping, nature-based-crafts, guided nature walks, and fostering shared spaces for reflective discussions and social interaction. Central to SSAP's design is a commitment to accessibility: the programme is offered free of charge, ensuring inclusivity regardless of individual's financial circumstances. Participants are supported throughout each session with transportation provided by minibus, comfortable settings for activities, and provisions for refreshments, comfort, and safety. This is particularly important during adverse weather conditions typical of the North-East-Scotland region's winters (Wild Things, 2024b).

### ***The evaluation of SSAP***

Our evaluation of SSAP revealed positive impacts that extend beyond individual wellbeing, to include broader community benefits. By fostering nature-based social connections through shared learning, and developing a shared sense of belonging among participants, SSAP modulates – both increases and builds – social capital, networks of relationships, shared norms, and trust that enhance cooperation within communities (Bhandari & Yasunobu, 2009; Teachman et al., 1997). This social capital is vital for maintaining mental and emotional health in older adults, particularly in the face of societal challenges like loneliness and isolation (Nyqvist et al., 2013, 2016; Sánchez-Santos et al., 2024). This paper comprehensively explores SSAP's mechanisms

for achieving these outcomes, drawing on qualitative data gathered via participant interviews, observational methods, and stakeholder insights. By triangulating these aspects, data-sources, and experiences, this study contributes valuable insights into how nature-based interventions can effectively promote holistic wellbeing and community resilience among older populations, primarily through fostering connections that increase social capital which typically declines in older populations (Keating et al., 2005; Muckenhuber et al., 2013).

The following sections first explore existing literatures linking wellbeing interventions with social capital. Then follows the methodology employed for this research. The key findings of the study are then presented, representing explorations of discoveries and elucidation upon the linkages between immersive, nature-led learning environments, social cohesions, and factors influencing formation of social capital in later life. The effects of these linked processes upon wellbeing are subsequently explored as a discussion; networking discoveries back to existing literatures and developing new theory-building. New theory – the *modulated social capital framework* – proposes linkages between SSAP, social capital development in later life and increased perceived participant wellbeing. Implications for new theory upon green-space and nature-based wellbeing initiatives are discussed, and suggestions for using the framework for new research studies are suggested.

## Social capital

Social capital (SC) refers to the value derived from social networks and the reciprocal relationships generated within them. SC includes resources such as trust, shared norms, and mutual supports generated from developing interpersonal group connections. SC is crucial for facilitating cooperation and coordination for mutual community benefits. Putnam's work on SC in the context of American community connections represents a foundational work on the subject (Putnam, 2000). Crucially, Putnam argues for three main dimensions of SC: bonding social capital (close-knit relationships like family and friends), bridging social capital (more distant connections like acquaintances and colleagues), and linking social capital (connections across different social strata or institutions). These combined social resources are essential for various outcomes, including economic growth, educational success, community cohesion, and fostering equitable positive public health processes, attitudes, and engagements (Arriola et al., 2024; Valbuena-Portillo et al., 2023; Veenstra, 2000). By fostering collaboration and collective action, SC dimensions enhance societal efficiencies, reduce transaction costs, encourage knowledge sharing, and promote innovation. SC is vital for societal functioning; leveraging networks to produce beneficial outcomes for both individuals and communities.

## Existing research examining wellbeing interventions and “social capital”

The existing research on wellbeing interventions encompasses a diverse array of studies linking nature and green-space, social inclusion and cohesion, and later life learning. Scholars such as Klein (2013), Ronzi (2016), Shanahan (2000), and Smyth et al. (2010) have contributed to understanding how SC impacts subjective wellbeing. A growing consensus highlights the positive effects of nature experiences on cognition, emotional wellbeing, and mental health (Bratman et al., 2012, 2021). This perspective constructs a framework affirming the benefits of nature immersion and green-spaces as fundamental to flourishing in life (Capaldi et al., 2015).

Examining connections, Frumkin et al. (2017) and Bratman et al. (2012, 2021) discuss linkages between rapid urbanization in late modernity and a diminishing emphasis on human-to-human contact. They highlight the positive effects of *nature contact* on cognition, emotional wellbeing, and aspects of mental health – suggesting positive outcomes associated with nature contact and green-spaces. Similarly, Capaldi et al. (2015) analyse the benefits of nature-connected approaches to promoting wellbeing, suggesting that forming psychological connections to nature can have powerful, influential effects over wellbeing, defining nature as fundamental to “flourishing” in life (p. 1). The World Health Organization (WHO) also presents evidence showing numerous benefits of exposure to nature and green-spaces, this correlating with improved health outcomes, including mental health (WHO - World Health Organization, 2016, p. 5). However, they caution that understanding the impacts and mechanisms of some effects remains incomplete and more research is required (p. 22, 27). Additional research supports these perspectives and highlights the salience of exploring nature-social-capital connections (Falk & Kilpatrick, 2000; Mitchell et al., 2024; Pretty & Ward, 2001). However – and notably – lack of specific evidence exists exploring the wellbeing effects linked with green-space-exposure experienced by older adults.

Some specific studies deconstruct select programmes and approaches similar to the different components that make up the SSAP. Most importantly, some studies present mixed results regarding the benefits of specific “intervention” components, such as green-space. For instance, Noordzij et al. (2021) explore the impacts of green-space immersion on subjective wellbeing in four cohorts of middle-aged and older adults, focusing on influences over depressed affect. The study sample consisted of aggregate data examining the impacts of green-space-exposure on wellbeing (p. 1). While the results indicated connections between psychosocial and physical health-factors and green-space, no associations were uncovered between distance to the nearest green-space or the volume of local green-space and mental health affectV – i.e. “depressed affect” (p. 1) – including measures of good self-rated health. The authors suggest that the importance of green-space may be lesser for older

adults who are urban residents. Evidence may imply that positive influences over wellbeing may result from a combination of factors rather than green-space-exposure alone. Findings spotlight the question whether wellbeing effects are attributable to the presence of *green-space itself* or to *specific activities occurring within green-spaces*. This highlights an important area for investigation – determining whether wellbeing effects are simply achieved by exposure to nature and green-space or are linked to specific activities, occurrences, and actions inside these spaces. Additionally, findings provide a platform to consider whether networked effects (i.e. effects of green-space *and* activities occurring within these spaces) offer the most significant pathway toward influencing wellbeing.

Regarding the role of community, this appears to play a crucial factor in development of perceived wellbeing. Robertson et al. (2022) explore the interdependencies between communities, environments, and social justice initiatives at enhancing quality of life (QoL) for older adults. They focus on the importance of generating agency for older adults within their community involvements as a key factor underpinning positive wellbeing. Definitions used match components of Putnam's work on SC. Similar findings have been highlighted by others, for example, Nyqvist et al. (2013) examine the role of developing SC generated by interactions between individuals and collective inclusive experiences with friends and family, which have positive impacts on mental health and wellbeing for older adults. Conversely, living alone, bereavement, and low contact with friends and family have been cited as negative factors affecting wellbeing (Allen, 2008). Additionally, lifelong-learning appears to play a key role in enhancing components of wellbeing for older adults (Merriam & Kee, 2014). Merriam and Kee (2014) argue that promoting lifelong-learning among older adults significantly contributes to overall community wellbeing, with learning operating to develop and form connections between social actors and maintain ties of cohesion and shared experience. The authors suggest that more active, healthy, and educated older adults place less strain on community resource services. Nyqvist et al. (2013) and Merriam and Kee (2014) both propose that lifelong-learning promotes SC, operating as a preservation mechanism against the decline in overall wellbeing. The authors contend that *both* formal and informal interventions and processes that promote learning activities for older adults are critical to developing active and engaged lifestyles linked with SC, thus enhancing community connections and wellbeing.

Notably, confabulations are evident when comparing different wellbeing initiative research. Some findings emphasize social connection effects as critically important for wellbeing, while other research emphasizes the wellbeing impacts of nature-immersion and greenspace influence. A current challenge of evaluations is to develop discourse on whether perceived wellbeing effects are resultant of – primarily – the presence of green-spaces alone, or the activities

occurring within these spaces that bring people together to generate social capital. Or, whether a combination of these effects can be attributed as a catalyst for generating perceived improvements in wellbeing. This study examines this question among older adults completing SSAP, to determine the precise mechanisms through which combined programme effects; nature, green-space, learnings, and social capital collide to generate positive wellbeing shift, and how this occurs.

## **Methodology**

Our evaluation employed qualitative methods to gather and analyse data, aligning with existing research on wellbeing interventions (Keeley et al., 2019, 2021; Ronzi, 2016). The following sections outline our methodological approach in detail.

### ***Evaluation timing***

The evaluation was conducted in December 2023, during the third year of the four-year charity-funded SSAP. This period was deemed optimal for assessing the programme's impact as the SSAP was well established and had developed wide-ranging uptake in the local community. This allowed us to capture the experiences of participants involved, using an iterative design that prioritized ongoing feedback and improvements and engaging individuals from a variety of time periods of participation with SSAP.

### ***Initial observations***

Before beginning data collection, researchers (NA<sup>1</sup> and EM<sup>2</sup>) observed an SSAP session held at Elgin Museum, Scotland. This observation provided opportunities to witness SSAP in action, speak with participants, facilitators, and project leaders, and understand the practical dynamics of running SSAP. Insights were invaluable for developing semi-structured interview framework, ensuring questions were grounded in relevant experiences and context.

### ***Defining “wellbeing”***

Wellbeing is a multifaceted and challenging concept to measure (Allen, 2008; Krueger & Stone, 2014). While quantitative scales offer snapshots of wellbeing, semi-structured interviews allow participants to define their own

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understandings and conceptualizations of wellbeing. This approach facilitated deeper exploration into how participants perceived their wellbeing to be influenced by SSAP, capturing diverse and personal pathways of affect. The flexibility of semi-structured interviews enabled us to prioritize participant autonomy and voice, providing a robust mechanism for capturing changes in wellbeing as perceived by participants themselves.

### ***Recruitment and participants***

We employed a non-probability sampling strategy, combining purposeful and convenience sampling. Details of the study were shared with SSAP attendees, inviting them to self-select for participation. Project support workers and a participant acting as a gatekeeper facilitated targeted recruitment. Our sample consisted of 17 female participants, all of whom were of White British ethnicity, aged 64–91 years (mean age: 77.5). Participants lived in or near three specific locales linked to three SSAP groups. The length of involvement with SSAP ranged from 3 months to 3 years; some participants having longer associations with other Wild Things! programmes. [Table 1](#) shows a breakdown of participant demographics.

### ***Semi-structured interviews***

Individual semi-structured interviews were conducted remotely with 17 participants, using Microsoft Teams (MS) or telephone, based on participant preference. Interviews lasted between 20 minutes to 1 hour and were guided by a pre-agreed schedule developed in consultation with the SSAP team and the Wild Things! development officer. Interviews were recorded and transcribed using MS Teams transcription software or a university approved digital-recording-device. This approach facilitated comfortable and accessible participation, especially for older adults in remote geographical locations. Interviews were conducted (remotely) in participants' homes or proximate locations, ensuring a supportive and familiar environment.

### ***Data analysis***

Interview data were analysed as inspired by Braun & Clarke's six-phase thematic analysis framework (Braun & Clarke, 2006). However, owing to the increasing rigidities associated with this methodology (Braun & Clarke, 2019), analysis also incorporated components inspired by constant comparison approaches (Braun & Clarke, 2021; Dye et al., 2000). Analysis phases included familiarization, repeated coding and re-coding, generating themes, reviewing themes, defining and naming themes, and writing-up finalized discoveries.



**Table 1.** Demographic characteristics of participants sampled

Participant number	Sex	Ethnicity	Age	How heard about SS	Length of time attending SS
1	F	White	88	Village weekly coffee morning	2 years
2	F	White	90	Word of mouth from friend	6 years
3	F	White	78	Village weekly coffee morning	2 years
4	F	White	74	Village weekly coffee morning	3–4 years
5	F	White	86	Local group	2 years
6	F	White	71	Local group	2 years
7	F	White	89	Local Group	2 years
8	F	White	76	Local group	2 years
9	F	White	77	Village weekly coffee morning	7 years
10	F	White	88	Village weekly coffee morning	A few years
11	F	White	75	Village weekly coffee morning	Unknown
12	F	White	76	Local group	3 years
13	F	White	76	Local group	14 years (Wild things)
14	F	White	75	Local group	Unknown
15	F	White	64	Local group	4 months
16	F	White	91	Local group	Unknown
17	F	White	77	Local group	2.5 years

“SS” refers to Silver Saplings. Additional data such as location and how participants became involved with SSAP were collected but have been removed to maximize the anonymity of participants for the purposes of this publication. This is owing to some of the locales where the SSAP runs to be small villages and hamlets where participants may be more readily identifiable.

Data were coded and analysed iteratively using NVivo 14. Double coding and independent analysis ensure the rigor and validity of the findings (conducted interchangeably by both NA and EM). Visual diagrams were created to clarify and review themes, enhancing the iterative analysis process through collaborative discussions and revisiting of raw data. Data were (re)compared back against all previous coding phases and levels to visualize the journey of connections, causalities, and discoveries identified by analysis and to cross-check validity of findings.

### **Ethical considerations**

Institutional ethical approval was secured from Robert Gordon University, School of Health (Ethics Reference: 23–11). Informed consent was obtained from all participants, who were provided with detailed information about the study’s aims and the interview process. Anonymity, privacy, and confidentiality were maintained throughout the research. All collected data were anonymized immediately and securely stored on an encrypted drive, accessible only by the researchers. We also planned – in advance – for participant support during interviews, remaining vigilant for any signs of distress and ready to offer breaks, topic changes, or to end the interview if required. No participants indicated distress during the interviews. Additionally, we remained mindful of the possible impacts upon researchers of engaging in detailed and in-depth discussions of wellbeing and factors influencing this. Thus, we implemented a structure of peer-supports between the primary researchers conducting interviews (NA and

EM) in the wake of having engaged in previously emotionally demanding research work together and developing past peer-supports (MacIver et al., 2024).

## Findings

### *Participant definitions of wellbeing: a typology of wellbeing definitions*

As a collective, participants described wellbeing holistically, encompassing social, physical, mental, psychological, and emotional dimensions, often interconnected. While individual emphases varied, each element was linked to participants' understandings of wellbeing and what this concept meant to them.

#### *Physical aspects*

Participants discussed physical wellbeing in terms of mobility, general health, outdoor activity, and maintaining a balanced diet. They highlighted the interplay between physical and mental health. This was evidenced by statements such as:

It's feeling good about myself, you know, being happy content. I mean, I know we can't be like that all the time, but most of the time I think that, I mean, I go out for a walk everyday for instance. . . and for me that's essential because that makes me feel good. So, you know, wellbeing is about health as well and you know I kind of feel that walking and being outside keeps you healthy, keeps you physically healthy, keeps your mind healthy too (Participant 12)

Being contented with life and living your best life and eating well [...] do as much exercise as possible, just generally being healthy if you can (Participant 9)

#### *Mental, psychological, and emotional aspects*

Participants described and defined mental wellbeing in terms of stress-reduction, emotional stability, happiness, coping abilities, and mental stimulation achieved through learning and engagement. Wellbeing as "an ability to cope" was mentioned by several participants; highlighting shared definition. For example, Participant 5 stated: "I think it's really being able to cope with everyday life with a little bit of extra." Participant 3 said: "I think it means that you're happy in your mind, with what you're doing and what you're seeing and just happy with life, I suppose." These explanations – among those of others – revealed an interconnectedness linking together the psychological dimension of wellbeing, with processes of thinking and emotional aspects of how life is viewed as generating positive feelings and emotions.

### ***Social aspects***

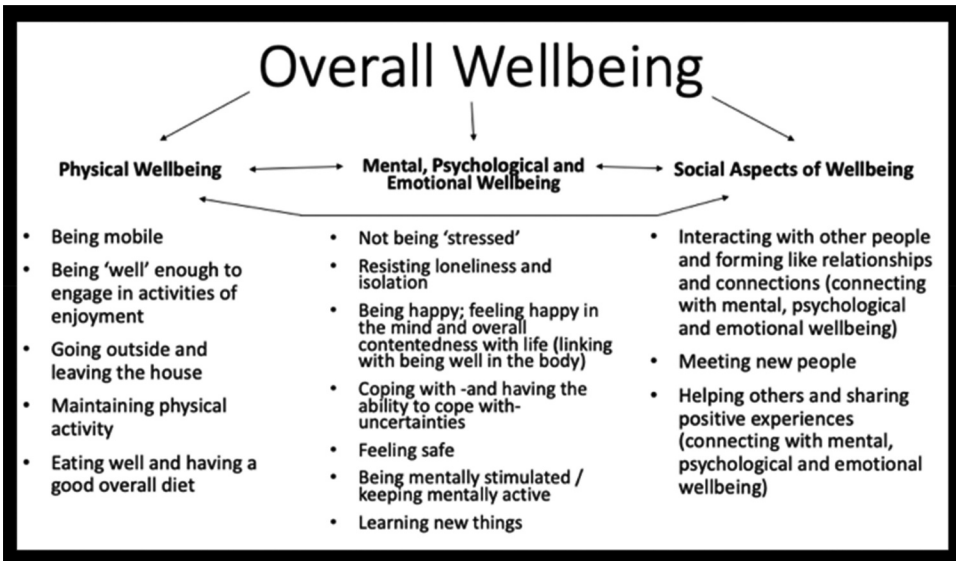
Additional to the above definitions, participants emphasized social wellbeing primarily through forming connections with others, socializing, and partaking in community engagement. As evidenced by participants, the importance of wellbeing as a socially experienced construct was prioritized; this is of particular significance following geographical relocations and post-pandemic lockdowns. For example, one participant defined wellbeing as “Being healthy and happy and able to get about and mix with people and socialise” (Participant 4). Additionally, participants frequently valued opportunities to share knowledge and support others, framing this as a component of social connections that encompassed mutual help and solidarity as a definition of wellbeing that also included a component of *learning and knowledge*. This was best encompassed by Participant 2 who stated:

Being able to discuss things and seeing what helps and everything and that’s how I want to be, that’s me at the moment. And understand what they do and why they do it. And to help other people. . .and engaging in knowledge. . .to help other people.

### ***A “linked” typology of participant wellbeing***

Each of the above dimensions contained overlap – spotlighting components that are connected with each other. For example, social aspects of “being and living well” and connecting with others: learning, engaging, and bringing people together, frequently played-out in interviews as linked with SSAP participants coming together in green-spaces, engaging collectively in shared activities with a common goal and having a set-aside space-and-time to find commonalities within their life-journeys, lived-experience, and individual sense of self and identities. This was facilitated via SSAP. Similarly, discussions of physical aspects centered on physical health as an essential component that *facilitated* the abilities of people to participate in shared activities. For example, a functional physical body emphasizing *capabilities* to co-experience activities, spaces, and engaged-learnings with others. Both components are networked with mental wellbeing: psychological and emotional understandings. Participants discussed the importance of *being active*, and defining this as co-occurring processes of physical engagement (as above) and complementary concurrent engagement in mental processes; learning, growing, accepting, and contemplating activities completed together. These experiences shared and co-produced perspectives, opinions, thoughts, and shared notions and understandings. These motifs – at their essence – are central factors to the production of social capital (Keating et al., 2005; Lu et al., 2023).

Using interconnected components of the above descriptors of wellbeing, SSAP participants all discussed the importance of remaining active: physically, socially, and mentally. As such, the SSAP effectively supported these



**Figure 1.** A typology diagram of participants' understandings of wellbeing  
 Note: all areas of wellbeing are interconnected and linked, as shown by the black arrows.

components of wellbeing, facilitating participants' physical, mental, psychological, emotional, and social growth. These shared understandings of wellbeing have been synthesized into a typology diagram illustrating the interconnected effects of these dimensions on wellbeing as explained by SSAP participants in Figure 1.

### **Primary perceived wellbeing effects of the silver saplings adventures programme**

Analysis of participant interviews demonstrated that involvement in SSAP clearly enhanced perceived wellbeing. Initial motivations for joining varied, including goals of increased social interaction, opportunities for nature exploration, and participants wishing for local discovery, travel and learnings surrounding their "home environment." However, the benefits experienced exceeded these initially described expectations, with some participants describing the programme's effects as "beyond expectations," "transformational," and a "reawakening," expressing a desire for the programme to continue beyond its current funding. For example:

Mainly I wanted to be in a social group, so that's why I joined it. But when I actually started to go out with them, I found it was really stimulating (Participant 1)

Some participants even offered to contribute financially or develop fundraising initiatives to continue SSAP. Overall, SSAP received overwhelmingly positive feedback from all participants, with programme content and perceived benefits of different components aligning with participants' self-defined concepts of "being and living well."

Collectively evaluating wellbeing effects, participants emphasized the role of SSAP in promoting physical activity and mobility, facilitated by outings to rugged outdoor locations that would otherwise be inaccessible. For example, the first participant interviewed (Participant 1) stated: "It got me being more keen to walk about and explore and go out rather than just sit in the house all the time." Another participant (Participant 10) spoke of how the structure and design of SSAP – which included the provision of transportation for participants – was a key component of bringing people together, facilitating the collective activities and discussions – connections that impacted definitions of wellbeing. Regarding being picked up in a minibus by SSAP staff, she stated: "I don't drive, so you can't go to places unless you drive." This highlighted the importance of the SSAP providing transport, which negated travel-barriers to engaging with people and nature-activities. Speaking to interconnected themes of the outdoors, green-space engagement, and development of new social ties, some participants networked these themes together in their interviews. For example, highlighting the social importance of SSAP in fostering new friendships and combating feelings of loneliness, particularly following the isolation of the COVID-19 pandemic. Participant 1 stated: "It (the SSAP) opened the world again for me after the lockdown for COVID [...] I think my whole life has been transformed."

Turning to exploring connections between social cohesions, nature-based activities, and perceived mental and emotional effects: participants all described the outings themselves – the nature-based aspects of the programme, as refreshing and mentally stimulating; detailing the fostering of a deeper connection to nature and the SSAP encouraging ongoing learning. Participant 8 summarized this best, drawing linkages between perceived improvements in mood, patterns of thinking, and propensity for positive over negative thoughts: "It bucks you up, it gives you something else to think about [...] it takes my negative thoughts away and it's something else to concentrate on." The SSAP's educational component was equally highly valued, contributing to participants' knowledge about nature and environmental issues. Participant 1 described this, highlighting the influential nature of SSAP on understandings of green issues and nature impacts: "...it's increasing my knowledge all the time [...] I'm conscious about which charities I'd support and I'm trying to do my little bit, really to make it a greener planet [...] it's just been an eye-opener."

Similarly, and referring to the nature-based components of learning and immersion, Participant 12 discussed the community aspect of SSAP, highlighting a reflective perspective on their experience of the SSAP. They stated:

...You don't know these things [the SSAP and activities] are necessarily good for you, but you come back after a day out and you go, yeah, that was really good, I really enjoyed that. ...there's a continuity about it in terms of enjoying it.

Drawing findings together, the SSAP effectively supports – *positively engages* – the multiple dimensions of wellbeing identified by same participants as the *defining anchors* of how they conceptualize “living well.” These findings underscore broader implications for enhancing wellbeing through outdoor access, lifelong-learning, and community engagement. The SSAP's success in meeting diverse wellbeing needs highlights its potential as a model for similar initiatives seeking to promote holistic health and social connection through combined nature-based interventions, later life learnings and the building and fostering of positive social connections.

### **Viewing the SSAP and wellbeing improvements through a “social capital” lens**

One of the most significant revelations from our evaluation was the promotion of social capital development among the older individuals participating in SSAP. SC denotes shared values and beliefs that unite groups with common objectives – fostering interaction and connection (Bhandari & Yasunobu, 2009; Nyqvist et al., 2013). SC also encompasses building social trust that facilitates coordination and cooperation, generating mutual benefits within communities. This includes the relationships and social connections individuals rely on for support, information, and resources. Some studies indicate a decline in SC as individual age (Slater, 2024), and this often correlates with perceptions of increased loneliness (Nyqvist et al., 2016), which is fundamentally detrimental to wellbeing as people grow older (Long et al., 2024; Tierney et al., 2024). The role of social capital in fostering community networks and enhancing individual and collective wellbeing has been extensively studied (Nyqvist et al., 2013, 2016). Moreover, existing research has highlighted the benefits of lifelong-learning in promoting community wellbeing (Merriam & Kee, 2014). We argue that SSAP effectively integrates these elements as core factors promoting perceived wellbeing. Synthesizing existing literatures linking increases in SC with enhanced wellbeing, the impacts of SC can be broken down into three linked conceptualizations. This is shown in Table 2, using the most established SC definitions developed by Putnam (2000). Connections to each form of SC fostered by the SSAP are mapped in a column on the far-right of the table: *SSAP Influence*, as drawn from participant interviews.

Table 3 maps the above categories of social capital to specific components of wellbeing, breaking these down into components of wellbeing

**Table 2.** Types of social capital, and linkages between SC types and structural components of the SSAP.

Type of social capital	Description	SSAP Influence
<i>Bonding Social Capital</i>	This type of SC pertains to close-knit relationships within a group. For example, family and close friends that provide emotional support. Bonding SC is characterized by cohesive, personal connections.	Within Group Connections
<i>Bridging Social Capital</i>	This type involves more distant connections. For example, acquaintances or colleagues that can grant access to new information and resources. These ties are critical for expanding social horizons and social actors integrating into broader social networks.	Teaching and Learning
<i>Linking Social Capital</i>	This type of capital refers to connections between institutions and individuals in positions of authority. For example, government agencies and organizations. These connections facilitate individuals accessing resources and opportunities beyond their immediate social circles.	Environment and Gatekeepers

**Table 3.** The benefits of different dimensions of social capital.

Aspect of wellbeing	Description	Classification
Mental Health	Social capital provides older adults with emotional support and a sense of belonging. These factors are critical for good mental health. Positive social interactions and strong support networks can lessen experiences of loneliness and depression for older adults. Engaging in social activities offers mental stimulation – helping to maintain cognitive functions over time.	<i>Bonding Social Capital</i>
Physical Health	Social capital promotes engagement in community activities and group exercises, enhancing physical health. Older adults with strong social ties are more likely to engage in physical activities, improving mobility, reducing risks of chronic diseases, and increasing overall physical health.	<i>Bridging Social Capital</i>
Emotional Wellbeing	A robust social network aids older adults in navigating life's challenges effectively. Emotional support from friends, family, and wider community resources can blunt the effects of stress and increase feelings of resilience. Feeling connected with others and valued within community contexts fosters a positive self-image and enhances emotional stability.	<i>Bonding Social Capital</i>
Access to Resources and Support	Social capital provides older adults with access to information and resources that can increase their quality of life – including healthcare, social services, and community initiatives. Bridging and linking social capital are important as they link individuals to wider networks and available institutional supports.	<i>Linking Social Capital</i>
Sense of Purpose and Engagement	Social participation and community involvement facilitate older adults toward a sense of purpose and formulate reasons to stay engaged with society. Volunteering, participating in group activities, and contributing to community projects generate meaning and fulfillment, increasing overall life satisfaction and positive perception.	<i>Bridging Social Capital</i>

and attaching these to the definitions of capital synthesized from literatures.

The positive engagements and effects of SSAP over the participant-defined social, mental, psychological, and emotional dimensions of wellbeing discussed can all be demonstrated as contributing to the accumulation of SC for older adults.

Synthesizing findings, via engagements with SSAP participants, were motivated to cultivate cohesive networks within their groups



demonstrating *bonding social capital*; connecting over shared interests, values, and aspirations. All participants expressed a strong desire to connect with others and engage with communities to find points of connection and commonality, explore new interests with new acquaintances, and to continue to foster these relationships following completion of the SSAP. Breaking this down into process: joining SSAP allowed participants to quickly integrate into a collective of like-minded individuals with whom they could discuss shared learning experiences facilitated by the programme, in a “safe space” context where conditions for building connections (i.e. a positive, inclusive, and supportive learning environment) were optimal. Beyond simply bringing individuals together, SSAP provided the resources and platforms for participants to initiate their own discussions evolving from learning exercises, fostering connections and building relationships based on shared experiences, values, and perspectives and developing *Linking Social Capital*. Additionally, SSAP enhanced *Bridging Social Capital* among older adults by fostering connections beyond their immediate social circles. Through diverse community activities, participants form new relationships, gaining access to a broader range of information, resources, and opportunities. SSAP teaches new wildlife knowledge, with volunteers imparting their expertise. This knowledge is discussed and shared among participants, strengthening social bonds and fostering mutual understanding. Group exercises and outdoor activities bring individuals from different backgrounds together, promoting mutual learning and support, and developing both *bridging* and *bonding* SC.

SSAP empowers older adults to stay engaged, active, and connected, enriching their lives and enhancing their integration into wider social networks. Table 4 provides some selected evidence highlighting linkages between the dimensions of SSAP, the voices of participants regarding the influence of SSAP on their wellbeing, and how this evidence links with the overarching categories of SC described in literatures in Table 2, and the impact of these wellbeing categories upon different SC components of wellbeing in Table 3.

Drawing these findings together, the SSAP effectively integrates the most beneficial elements of nature-based wellbeing initiatives highlighted in existing literatures, creating a holistic wellbeing framework that intersects different positive effects by co-developing different – overlapping – forms of social capital. By combining immersion in natural environments, life-long-learning opportunities, and networking these influencers to influencers of *bonding*, *bridging*, and *linking* social capital dimensions, the cultivation of SC among older individuals – while respecting their autonomy – is revealed as a significant influencer of developing perceived wellbeing.

**Table 4.** Evidence table of quotations, linked to dimensions of social capital, as told by SSAP participants discussing the influence of the SSAP on their wellbeing.

Participant number	Quotation	Influence on Social Capital (SC)	Form of SC influenced
12	<i>"It's feeling good about myself, you know, being happy [and] content. I mean, I know we can't be like that all the time, but most of the time I think that. I mean, I go out for a walk everyday for instance. . . and for me that's essential because that makes me feel good. So you know, well being is about health as well and and you know I kind of feel that walking and being outside keeps you healthy, keeps you physically healthy, keeps your mind healthy too."</i>	<i>Importance of engaging in physical activities and social interactions, that contribute to both physical and mental health.</i>	<b>Bonding social capital</b>
9	<i>"Being contented with life and living your best life and eating well and 100 do as much exercise as possible, just generally being healthy if you can."</i>	<i>Physical activity and self-care; influencing overall health and satisfaction.</i>	<b>Bonding social capital</b>
4	<i>"I love walking and seeing things; doing and learning things and just the experience really. It's nice and it's social. [There are] friendly, informative and helpful staff on the trip. And I've learned new things on every trip, which is great and it bridges the age gap as they work with young and old. And a lot of people, not so much me, but a lot of people on the trips know lots of things that people are learning from each other . . ."</i>	<i>Social and educational aspects of the SSAP. Bridges the age gap and fosters interactive learning between members of the SSAP.</i>	<b>Bridging social capital</b>
9	<i>"I couldn't manage without them. I really couldn't . . . and I really look forward to it, you know, and it's just, they're just such lovely people and so kind. [ . . . ] But you know, [now] I'm looking at this, they've got a thing of a map here of them, different plant life. And it reminds me of when we went to the wildlife thing, you know, and they were finding all different bugs. And we found a toad. It does increase your knowledge of things and keeps your mind active and it gives you conversation. I mean, we often; the [whole] group of us that go we often sit and talk about what we did when we did it and how lovely it was. We're still talking about the visit to Elgin Museum two weeks later, you know?"</i>	<i>Emotional support and intellectual stimulation provided by the SSAP. Keeping minds active and fostering social interaction.</i>	<b>Linking social capital</b>

## Discussion: a modulated social capital framework

Existing studies using SC as a theoretical framework to understand positive effects are valuable. However, they also have shortcomings. Research focusses predominantly on the structural dimensions of social capital, viewing influence from each dimension (*Bonding*, *Bridging*, and *Linking* SC) – at times – in isolation as opposed to combination. Furthermore, the size and density of SC-

producing networks are often prioritized, eschewing the importance of conducting in-depth explorations of the *quality of interactions* and *shared values* within groups that can lead to the construction of SC. This focus can lead to an incomplete understanding of SC's functioning and an over-reliance on perceiving SC as a general construct increasing "wellbeing," as opposed to developing more nuanced qualitative understandings of how wellbeing effects are generated by different combinations of SC. Further, SC theory tends to highlight positive outcomes like increased trust and cooperation, overlooking negative aspects such as exclusionary practices and the reinforcement of inequality and power dynamics within tight-knit networks, often assuming equal benefits for all members. Considering Western-centric and age-related bias in existing SC frameworks, SC theory may struggle with contextual limitations, with both the nature and effects of SC likely varying across different cultures and societies, with cultural variance rarely recognized or discussed. The *modulated social capital* framework developed from the findings of this work serves to address some of these issues.

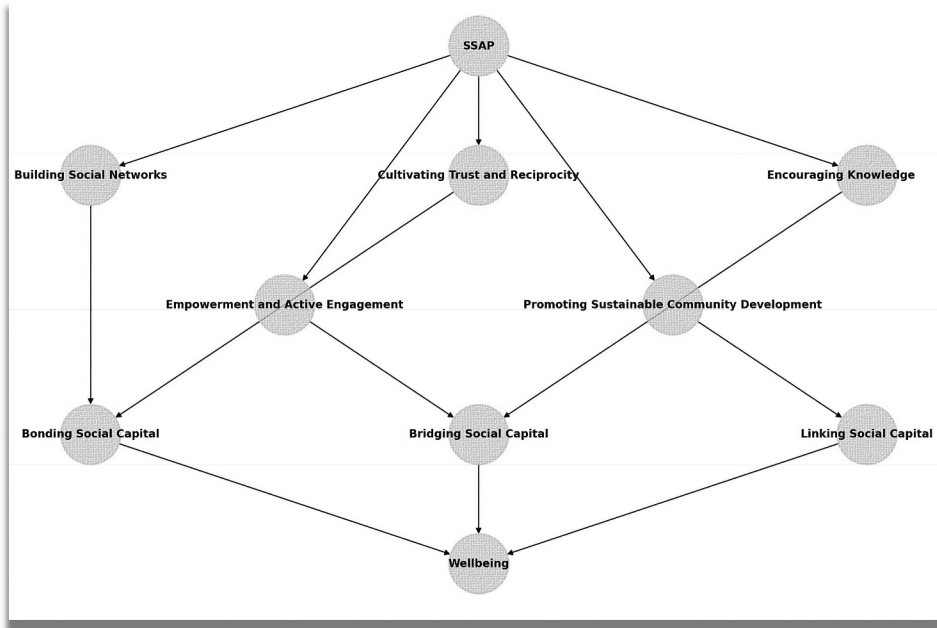
SSAP serves as a robust platform for the development of SC among older adults, employing a comprehensive approach to enhance their perceived wellbeing. SSAP offers a setting for older adults to interact, creating opportunities to form new social connections. Shared activities such as nature walks and community projects provide common ground for participants to bond over mutual interests. These interactions help build strong networks of social support, which are crucial in alleviating loneliness and isolation. By facilitating these social connections, SSAP significantly enhances emotional and social wellbeing, contributing to a sense of belonging and community. This foundational layer of *bonding social capital*, characterized by close-knit relationships, forms the bedrock of a supportive community. Regular interactions within SSAP foster trust among participants. Collaborative tasks and mutual support promote a sense of reciprocity – essential components of both *bridging* and *linking* SC. This trust facilitates cooperation and collective nature-linked actions and bonds within communities. SSAP's focus on teamwork and shared experiences strengthens these bonds, constructing a supportive community environment, networking together *bonding* and *linking* SC with *bridging* SC. This can reduce perceived stress and promote a sense of security, enhancing overall wellbeing. *Bridging social capital*, facilitated by these broader interactions, expands the social horizons of individuals, connecting them with new resources and opportunities that lie beyond their immediate circles. SSAP promotes lifelong-learning and the mutual exchange of knowledge. Participants share experiences and insights during group activities, enriching individual learning and fostering a sense of community. The intergenerational aspect of SSAP, where younger volunteers engage with older participants, further enhances this knowledge-sharing-community dynamic. This bridges generational gaps and improves social cohesion, providing cognitive

stimulation and a deeper sense of community. The *linking* SC created through these interactions connects participants with broader networks. By involving participants in activity planning and decision-making processes, SSAP empowers participants while fostering a sense of agency. This active engagement increases commitment to SSAP and recurrent investment in shared communities. Empowerment through participation is crucial for building all three dimensions of SC, as it encourages individuals to take the initiative and contribute to collective wellbeing. This empowerment enhances self-worth, contributing to the overall wellbeing of participants, with these empowered participants becoming active agents within their communities – promoting further growth and sustainability of the cohesive social networks they now belong to.

The interplay of bonding, bridging, and linking social capital within the SSAP creates a holistic framework for social support and community engagement. *Bonding social capital* offers emotional support and strengthens personal relationships. *Bridging social capital* introduces participants to new social circles, enhancing their access to diverse resources and information. *Linking* social capital connects them with institutional networks and broader societal structures, providing avenues for greater resource access and influence. Together, these forms of SC are networked in a way that each reinforces and enhances the other, creating a robust and dynamic community fabric. Overall, the SSAP exemplifies a comprehensive model for fostering SC, highlighting the significant positive impact upon the wellbeing of older adults. Through structured social interactions, knowledge exchange, and active community engagement, SSAP effectively strengthens social bonds and promotes a holistic sense of wellbeing among its participants. This integrated approach demonstrates dependencies and mutual linkages between different formations of SC; one form of capital is influenced by a specific component of the SSAP, but then going on to develop generation of another form, as a knock-on effect. Thus, all three dimensions of SC are networked, leading to improvements in one element *modulating* positive shifts in the other. To this end, the *modulated social capital* framework functions like a circuit.

Figure 2 shows a linked model of how different dimensions of wellbeing are improved, drawing on the voices of research participants and connecting these improvements to linked growth in different dimensions of SC.

Notably, existing research demonstrates the interconnectedness of these SC elements in fostering wellbeing. Our *modulated* perspective extends the existing literature by Klein (2013), Ronzi (2016), and Shanahan (2000). While previous studies have emphasized the benefits of nature and green-spaces on mental health, such as Bratman et al. (2012, 2021) and Capaldi et al. (2015), this research uniquely explores whether these benefits stem from exposure alone or from specific activities within these spaces, demonstrating that – predominantly – positive effects originate



**Figure 2.** Note: SSAP (the first node) highlights the SSAP. The influence of the SSAP represents a cascade in effect over SC. Linkages with different influencers of wellbeing (i.e. Empowerment and Active Engagement) are demonstrated by the arrows.

from a combination of both: the influence on different components of wellbeing developing from different linked improvements in dimensions of SC. This is particularly important as Noordzij et al. (2021) spotlight mixed results regarding the benefits of green-space for older adults in urban settings. This study reinforces the critical role of community engagement and social interaction, as highlighted by Robertson et al. (2022) and Nyqvist et al. (2013), who emphasize the role of developing SC through interactions and inclusive experiences with friends and family. Additionally, the findings expand on Merriam and Kee's (2014) discoveries regarding lifelong-learning and intergenerational interactions by demonstrating how SSAP's structured activities foster trust, reciprocity, and collective action, which are essential components of SC. The SSAP's inclusion of intergenerational interactions and lifelong-learning opportunities align with arguments made by Merriam and Kee (2014) spotlighting that promoting lifelong-learning among older adults significantly contributes to overall community wellbeing. This research provides a detailed analysis of how these interactions bridge generational gaps and enhance cognitive stimulation, which is less-discussed in existing studies. Findings underscore the empowerment and sense of agency gained by older adults through active participation in SSAP, echoing similar findings by Robertson et al. (2022). This aspect of empowerment and its

contribution to SC development and wellbeing is a critical addition to the literature.

## Conclusion

In conclusion, this research demonstrates the Silver Saplings Adventures Programme as significantly enhancing perceived participant wellbeing at both individual and community levels in a sample of older adults. This occurred via fostering social connections, promoting physical wellbeing, encouraging lifelong-learning, and nurturing environmental awareness, these promotional activities taking place in different local green-space environments. Perceived benefits were mutually reinforcing through a *modulated social capital framework*, contributing to a sense of collective wellbeing and community cohesion, and underscoring the profound impact of nature-based interventions like SSAP on participant-perceived holistic wellbeing.

Saliently, this research adopts a social capital lens to examine the mechanisms by which the SSAP can develop participants' social capital, leading to perceived enhancements for the wellbeing of older adults. Our study addresses gaps in existing research by exploring the specific mechanisms through which SC is developed and the combined effects of nature, green-space, learning, and social activities. This comprehensive approach generates valuable insights into creating effective wellbeing interventions for older adults, demonstrating the combined effects of nature, green-spaces, learning, and social activities. By building social networks, cultivating trust and reciprocity, encouraging knowledge sharing, empowering participants, and promoting sustainable community development, SSAP creates a supportive and engaging environment that significantly enhances the perceived wellbeing of older adults. This integrated approach ensures that as social capital grows, so too does the collective and individual wellbeing of those involved, creating a thriving, interconnected community initiative.

The *modulated social capital* framework developed from the findings of this research provides a platform to consider the dual-role of green-space-environments as a facilitator to generate social capital, in tandem with recognizing the importance of wellbeing initiative-led activities and their bonding, pro-social and pro-learning mechanisms that occur within green-spaces. Future research should benefit from further developing knowledge surrounding factors that can influence and modulate different dimensions of SC, recognizing that effects in one domain can underpin effects in others, leading to a networked model of influence over perceived wellbeing. A further logical step would be to test this paradigm in a larger – more diverse – sample, providing a new opportunity to further develop this theory.

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## Data availability statement

Data is not available; it stored securely and anonymously.

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