

Slide 5:

While incorporating the pathways into the activity planning stage will help to facilitate Nature Connectedness, being able to measure the effectiveness of your interventions is also a vital aspect to include. This evaluation aspect is, in many ways, just as important as planning the intervention itself. Given that you are part of a larger group of partners – all of whom are developing such interventions, it is important that everyone is using a common set of tools – that is, a common set of measurement scales – with which to assess their programs. This allows for a true comparison across many programs. The Nature Connectedness Lab Research Team at the University of Derby will be doing just that. So to make that possible – and to most accurately measure your program’s effectiveness at enhancing nature connectedness, well-being, and pro-nature behaviour – this section walks you through the set of measurement tools to use. They really are pretty straightforward and you can pick and choose from among each set as best suits your needs. We will also go over some overall guidelines for best procedures to follow regarding assessment in order to ensure that the information (data) you are collecting is as accurate and usable as possible. So let’s start first with the selection of short and simple measures.
[move onto slide 6]

Slide 6:

Measuring Nature Connectedness (NC):

4 measures – 2 required and 3 additional recommended measures. Please choose the NCI and the INS. You can also choose one of both of the other NC measures from this section.

Nature Connectedness Measure #1: The Nature Connectedness Index (NCI)

Background: Our relationship with nature and the importance of it for our health and wellbeing and that of all of nature through our behaviours is of growing interest for policy and practice too. This was the catalyst for the development of a measure of Nature Connectedness that was simple to administer, could be used with a variety of ages, and one that could be used on a population as well as an individual level.
[move onto slide 7]

Slide 7:

The NCI uses a 7-point scale to assess a person’s Nature Connectedness ranging from completely agreeing to completely disagreeing with these six statements:

1. I always find beauty in nature
2. I always treat nature with respect
3. Being in nature makes me very happy
4. Spending time in nature is very important to me
5. I find being in nature really amazing
6. I feel part of nature

[move onto slide 8]

Slide 8:

Nature Connectedness Measure #2: The Inclusion of Nature in Self (INS)

Background: The INS was one of the first measures developed to assess Nature Connectedness. It has been used countless times across diverse populations. The INS is a one-item measure which gets right to the essence of nature connectedness by simply asking people to choose the diagram that best describes your relationship with nature. How interconnected are you with nature?

[add diagram and reference to slide: Schultz, P.W. (2002). "Inclusion with nature: The psychology of human-nature relations." In *Psychology of sustainable development*. Edited by P. Schmuck and P.W Schultz, 61– 78. Boston, Dordrecht, London: Kluwer Academic Publishers]

Slide 9:

Nature Connectedness Measure #3: The Connectedness to Nature Scale (CNS)

Background: The next measure that was developed was the CNS. The CNS may be the most commonly used measure to assess nature connectedness. It gets at broader and more nuanced aspects of nature connectedness. It is looking at the trait of Nature Connectedness – something along the lines of how one would assess different aspects of personality – like openness or agreeableness.

The CNS consists of 14 items as seen here and on your handout package. The prefacing blurb to participants asks them to answer in terms of how they generally feel. This is a good measure to use as a pre-measure, so before the intervention. It can also be as a post-measure to assess change in levels of nature connectedness. Although the CNS and the next scale we will look at, the NRS, position nature connectedness as a "trait", it is still seen as changeable and able to be influenced. a growing body of research, as we have seen in the case studies, evidence boosts in this "trait" of nature connectedness. And indeed, that is what your programs are geared to!

[add items and reference> Mayer, F. S., & Frantz, C. M. (2004). The Connectedness to Nature Scale: A measure of individuals' feeling of community with nature. *Journal of Environmental Psychology, 24*, 503-151.]

slide 10:

Nature Connectedness Measure #4: The Nature Relatedness Short-Form (NRS-SF)

Background: Lastly, the NRS was developed to further enhance the assessment of nature connectedness. The original NRS was developed as an extension to the CNS by not only assessing closeness with nature on an emotional or cognitive level, but to also assess the physical aspect of the human-nature relationship.

The NRS measures three facets of a person's relationship with nature:

- 1) Self – internal identification with nature (kind of like the INS and the CNS are getting at);
- 2) Perspective – looking at the external nature-related worldview – a sense of agency concerning human actions and their impact on all living things.
- 3) Experience – physical familiarity with nature – or environmental attitudes.

The NRS has 21 items, 7 items to assess each facet of the human-nature relationship. You can use the whole scale, or you can use only the NR-Self subscale.

Alternatively, if you want to assess all three facets, but do not want to ask so many questions, you can use the NR6 – the short form of the NRS. This, as the name suggests, has just 6 items assessing the Self and Experience dimensions or facets. This is a good scale to use when you are limited in the number of questions you want to ask, and are also more interested in the connectedness elements.

[items and references:

Nisbet, E. K., & Zelenski, J. M., & Murphy, S. A. (2009). The Nature Relatedness Scale: Linking individual's connection with nature to environmental concern and behaviour. *Environment and Behavior, 41*, 715-740.

Nisbet, E. K., & Zelesnki, J. M. (2013). The NR-6: A new brief measure of nature relatedness. *Frontier in Psychology, 4*, 813.]

slide 11:

Measuring Well-Being (WB): Feeling good and functioning well

Well-being comprises more than just feeling happy or feeling good (also known as 'hedonia'; functioning well (or 'eudaimonia') is also an important aspect of true overall well-being. It is important to capture both these dimensions of well-being.

Slide 12:

Measures of "feeling good": assessing hedonic well-being

Let's first start with a couple of brief measures of feeling good – sometimes referred to as just plain old "happiness" - but really a mix of emotions! Here we are focusing broadly the concept of pleasure – or from a philosophical or technical view 'hedonia'.

2 measures. Please choose *at least one* of these measures to assess the "feeling good" or hedonic aspect of well-being.

slide 13:

Well-Being Measure #1: The Scale of Positive and Negative Emotions (SPANE)

Background: The SPANE measure reflects a wide range of emotions – "good" and "bad" – with varying levels of arousal. For example, while both "joy" and "contentment" would be considered positive emotions, joy is associated with more arousal than is contentment. And similarly for negative emotions. This scale, already widely-used, is gaining in popularity with researchers as simple tool for gauging the 'feeling good' aspect of well-being.

The SPANE consists of 12 items listing 6 positive and 6 negative emotions. Respondents rate how often they have experienced each emotion listed in the past xx weeks. The "xx weeks" can be adapted to suit the study. As a pre-measure, use *four weeks*. As a post measure, use the length of the intervention or program. If use as a follow-up measure, use the length of time between the end of the intervention/program and the time of the follow-up assessment.

This is an essential scale to include for assessing the well-being outcomes of your program.

[items and references:

Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S., & Biswas-Diener, R., (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research, 97*, 143-156.]

Note: If you choose *only* the SPANE, then you must include the following one-item question regarding satisfaction with life: In general, how satisfied are you with your life as a whole?

Slide 14

Well-Being Measure #2: Satisfaction with Life Scale (SWLS)

Background: This scale is another staple measure used to assess well-being. It's one of the earliest measures that was developed when the science of well-being was really in its infancy. And the SWLS had stood the test of time. It is used globally, and is well-established in the well-being literature. Used with the SPANE, these two measurement tools capture what researchers call 'hedonic well-being' or as we noted before, simply feeling good.

The SWLS is a brief 5-item scale that asks people to make a judgement on their life as a whole.

[items and references:

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49, 71–75.]

Note: If you choose *only* the SWLS, then you must include the following one-item question regarding happiness: “In general, how happy are you?”

Slide 15

Measures of “functioning well”: assessing eudaimonic well-being

In this section and with these assessment tools, we look at the ‘eudaimonic’ aspect of well-being- functioning well. Here we are grounding ourselves in facets of well-being linked with meaning in life, and with our basic human needs of autonomy, competence, and relatedness, that we all – every one of us just by virtue of being human – need to satisfy in order to truly flourish. We need both the ‘feeling good’ or ‘hedonic/pleasure’ parts of life AND the ‘functioning well’ or meaning and eudaimonic parts of life. One without the other is like a bird with one wing, it does OK – but it can’t really achieve its fully potential.

2 measures. At minimum, please choose the *Flourishing Scale*. The *Basic Needs Satisfaction* measure can be added in addition to the *Flourishing Scale* in order to capture a broader, and more nuanced, assessment of eudaimonic well-being.

Slide 16

Well-Being Measure #3: The Flourishing Scale (FS)

Background: The FS was developed to capture the aspects of fully functioning well that other researchers have deemed to be basic universal human psychological needs. These are needs for competence, relatedness, self-acceptance, meaning and purpose in life. The FS also captures other aspects that research suggests are of fundamental importance to functioning well: optimism, social ‘capital’ -giving and receiving help to/from others, and engagement with life. This measure is a widely-recognized assessment of eudaimonic well-being, and is well-suited to used in conjunction with the SPANE (see above in the “feeling well” hedonic measures).

The FS has 8 items to assess these facets of eudaimonic well-being. or functioning well.

[items and reference:

Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S., & Biswas-Diener, R., (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research*, 97, 143-156.]

Slide 17

Well-Being Measure #4: Basic Psychological Needs Satisfaction (BPNS)

Background: The BPNS was developed to measure levels of individual’s satisfaction of their basic human psychological needs of autonomy, competence, and relatedness. This scale provides a more in-depth assessment of these needs than has been captured by previously developed measures.

The BPNS consists of 12 items, 4 items assess autonomy, 4 items assess, competence, and 4 items assess relatedness.

[items and reference:

Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. L., Van der Kaap-Deeder, J., Duriez, B., Lens, W., Matos, L., Mouratidis, A., Ryan, R. M., Sheldon, K. M., Soenens, B., Van Petegem, S., & Verstuyf, J. (2015). Basic psychological need satisfaction, need frustration, and need strengths across four cultures. *Motivation and Emotion, 39*, 216-236.

Slide 18

Measures of pro-nature behaviour: pro-nature conservation and pro-environmental behaviour

In this section and with these assessment tools, we look measurement tools to assess two different aspects of pro-nature behaviour: pro-environmental behaviour and pro-nature conservation behaviour. While there is a relationship between these two kinds of behaviour, they are, in fact, distinct.

In general, pro-environmental behaviours are focused on reducing one's carbon footprint and/or minimizing the impact of one's actions on the environment (see reviews by Lange & Dewitte, 2019; Li, Zhao, Ma, Shao, & Zhang, 2019). Behaviours such as recycling, reducing consumption and waste, and taking transit or cycling as modes of transport can be categorized as primarily pro-environmental behaviours. Such actions are vitally important. At the same time, the ecological crises we are now facing also requires individuals to engage in activities that actively and directly support the restoration of the biodiversity of plant and animal species (Ceballos, Ehrlich, & Dirz, 2017). Such behaviours can be classified as pro-nature conservation behaviours. Examples of pro-nature conservation behaviours include voting for parties/candidates with strong pro-nature conservation policies, volunteering with conservation organizations, installing a bee hotel, planting native plants, and leaving undisturbed/unmaintained areas for wildlife (Barbett, Stuppel, Sweet, & Richardson, 2019).

2 measures. At minimum, please choose the *Pro-Nature Conservation Behaviour Scale*. You can also add the *Pro-Environmental Behaviour Scale* if you are interested in assessing both facets of the pro-nature behaviour.

Slide 19

Pro-Nature Behaviour Measure #1: Pro-nature Conservation Behaviour Scale-Short Form (ProCoBS)

Background: The ProCoBS is the definitive tool for measuring conservation behaviours, which are applicable in the UK as well as Central and Northern Europe. This measure is the first of its kind, assessing behaviours that specifically support the conservation of biodiversity.

The ProCoBS is an 8-item measure that assesses active behaviours that specifically support the conservation of biodiversity in two areas: civil actions and garden-related behaviours.

[items and reference:

Barbett, L., Struppel, E., Sweet, M., & Richardson, M. (2019b; under review). *Measuring Actions for Nature – Development and Validation of a Pro-Nature Conservation Behaviour Scale*.

Slide 20

Pro-Nature Behaviour Measure #2: Pro-Environmental Consumer Behaviour (PECB)

Background: This scale was developed as a self-report scale assessing pro-environmental consumption behaviours. This scale acts as a complement to the ProCoBS measure (above) in providing a more complete picture of pro-nature behaviours that people engage in.

The PECB consists of 16 items listing common (and beneficial) pro-environmental behaviours. Respondents are asked to report how often they engage in these behaviours.

[items and reference:

Schmitt, M. T., Mackay, C. M. L., Droogenyk, L. M., & Payne, D., (2019). What predicts environmental activism? The roles of identification with nature and politicized environmental identity. *Journal of Environmental Psychology, 61*, 20-29.

Slide 21:

We've provided you with a number of assessment tools to measure your programme's outcomes. We'll talk about the timing of these assessments in the next segment. For now, though, let's take a few minutes to revisit the Pathway Activity Planner sheets and discuss which set of measures you think would be most appropriate to use with your programmes.

Using the appropriate box at the bottom of the Pathway Activity Planner, decide which outcomes you wish to capture and which measures best suit your programme's interests. It is important to build in outcome evaluation at this stage to ensure the data does get captured, and to ensure that doing so does not interfere with the activity itself.

This overview sheet summarizes the tools we have discussed today and from which to choose from. (see handout as well as on slide). Keep in mind that on average, you can budget about 15 seconds per item. So 29 items will only take most people about 10 minutes to complete.

Slide 22:

When and how to use these measurement tools

Now that we've gone over *what* measurement tools to use, we're going to take a look at *when* and *how* to use these tools. Let's start with *when*.

When to use these measurement tools.

Another important aspect of assessing the impact that your program has on your clients, is when you use these outcome measurement tools. Ideally, we want to have clients/participants complete these measures before they partake in the intervention/programme, after the programme is completed, and at some pre-determined point in the future some time after that – perhaps days or weeks later – as follow-up.

Pre-Assessment

Having participants complete these measures before they start your programme is called a pre-assessment. Scores at pre-assessment provide a baseline from which to gauge future changes in nature connectedness, well-being, and pro-nature behaviour—our outcomes of

interest. Statistical analyses can be done (which researchers at the University of Derby will do) comparing scores at pre-assessment to scores at post-assessment (after the programme has ended) in order to determine if any changes occurred. And to examine if changes in nature connectedness, well-being, and pro-nature behaviour were of significant and practical note.

We recognize that in most (but not all) cases, assessments from participants in a control group may not be feasible to collect (that is, having people who are not taking the programme complete the measures at the same time points as people who were registered in the program). In research jargon, this is a 'within-participants' design and the focus is on the change in participants' scores before to after the programme. This provides a good indication of how much an impact the program had; this is information you can then use to refine your program – or just to keep doing what you're doing confident that it's working. This kind of data also provides you with 'hard' scientific evidence of your programme's effectiveness; data that you include in pitches and applications for continued funding for your programme and to provide to interested clients. Such data helps to distinguish you and your programme.

(We summarize this on an easy-to-follow) flow-chart below. [Presenters could hand out the flow charts below for reference as going through these guidelines.]

We recommend that participants complete your measurement package as part of their register for your programme or a day or two before when you send them a confirmation of their registration. At a minimum, have participants complete the package the day before the programme begins. This is important so as to get a more accurate baseline measure – especially for programmes that are single, one-time sessions of relatively short duration (i.e., from an hour up to two days). This lead time is important. When people complete self-report measures, even a very brief few questions, and then are asked to complete the same measures/questions again—if the intervening amount of time is only a few hours, or even a day two—people tend to remember their answers from before and it's very difficult to accurately gauge real change in outcomes (in our case, on nature connectedness, well-being, and pro-nature behaviours or intentions).

While ideally participants would all complete the pre-assessment on the same day - or the same amount time prior to the programme, the timing of the pre-assessment (except that it be a minimum of the day before) is not as crucial as the timing of the post-assessment.

Post-assessment

The next measurement time point is, of course, when the programme has been completed. We call this the 'post-assessment'. Participants should complete the same questionnaires that they completed at the pre-assessment. The timing of completing the post-assessment is crucial. On two factors – that all participants complete the post-assessment within the same time-span after the programme ends, and how long that time span should after the programme ends to the completion of the post-assessment.

Firstly, it's important that all participants complete the post-assessment within about the same amount of time after the programme ends. Effects from a program are usually at their strongest right after the conclusion of the programme, and then fade to some degree as time goes on and daily live concerns are dealt with. This is not to say that *all* the effects of the programme fade away – of course not! Some may even get stronger as people have

more time to integrate their learning into their self-concepts and daily routines and behaviour. For these reasons we will discuss follow-up assessments.

For all these reasons though, with regard to the post-assessment, it's thus critical that the all participants complete the post-assessment within about the same time frame after the programme ends. This is the only way to accurately measure the effect of the programme. (Otherwise it would be like trying to assess the impact of eating a huge piece of chocolate cake on how people felt – but some people are reporting on how they felt right after eating the cake, some hours, later, and others two days later.)

Guidelines (as outlined in the flow chart) are as follows: For programmes that are singles sessions or last one or two days: we recommend that people take the post-assessment at the end of the programme, right there, on the spot. You build time into the end session for people to do this perhaps – people could complete on their cell phones/mobiles even! This would be ideal and would capture the best data. Additionally or alternatively, you could send participants a link to the post-assessment to be completed within 24 hours.

For programmes that are several sessions over the course of a week or more: we recommend that people take the post-assessment 2 to 7 days after the programme ends depending on the length of the programme.

As noted in the guidelines on *how* which we will discuss shortly, recording the date of the programme end and the date and time that the participant completes the post-assessment is vital. If our research collaborators need to, they can account for and take into consideration the “time since programme ended” as a factor when analyzing the data.

Follow-up assessment

Lastly, you may choose to ask your participants to take part in a follow-up assessment at some point after the end of the programme. As with the post-assessment, it's crucial that participants are completing these within relatively the same time frame. It's hard to determine an effect if some are assessing the impact 3 days after the programme ended, while others are reporting 3 weeks after the programme ended.

The time span to conduct your follow-up assessment depend in part on the length of your programme. For single-session one-time programmes, or programmes that last one or two days, a reasonable follow-up time frame would be one-week. For longer programmes that spend the course of several days or perhaps even weeks, this time frame should be increased accordingly—for example, a couple of weeks to even a month or more.

Analysis of data from follow-up assessments provides you with valuable information regarding the enduring effects that your programme has on participants.

Special note on what to ask at follow-up. You can choose at follow-up to ask your complete set of measures that you asked at pre- and post-assessment. Or can choose just a subset of these, perhaps asking only one of the measures. Either is, just do remember to still ask all the items within any of the particular measures. That is, if the measurement has 6 items (or 6 “questions”), then ask all 6 of these.

[Flow charts follow below / on handouts / slides . Script continues below with discussion of *how*, which includes suggestions on other important information to capture alongside the

actual measurement tools. This sections also provides a few basic guidelines on actually *how* to collect data – logistics of doing so, order of questions, etc.]

How to use these measurement tools

We've included in your package a set of each of the measurement tools with their titles. We have also included a sample of how to present the tools to participants. When providing participants with the measures to complete, label each measurement tool simply at "Questionnaire #1" etc or use only the scale's acronym (e.g., NCI, INS, SPANE, SWLS, FS, ProCoBS). It's important that the tools are presented in this manner so as to not unduly influence people's responses.

Present the questionnaire items for each measure **exactly as provided**. These scales have been carefully tested. Changing the wording of the items or the response scales for each measure can invalidate the results, in addition to impairing direct comparisons of scores on a scale between programmes or in larger meta-analyses.

Keep the preface of instructions for measures as is. Again, these have been carefully tested and changes to how the measures are introduced can invalidate the results.

The one exception to this rule is with reference to time frame. For pre-assessment measures: it is good to ask participants to answer with regard to how they *generally* think or feel. Alternatively, you can use the time frame of *the past four weeks*.

For post-assessments: If the programme was a single session one-time programme lasting only an hour, a few hours, to two days; then use the time frame of *currently*. This captures more of state feeling / thoughts and will more accurately reflect the impact of the programmes shorter in duration – that is, single session one time programmes or those than run for one whole day or two consecutive days.

If the programme is of longer during, with several sessions running over the course of a week or more, then choose a time frame consistent with the length of time the programme covers. For example, if the programme was once or twice a week for two weeks, then ask participants to answer the questions based on how they felt *over the past weeks*. If the programme ran over the course of a week – then ask participants to answer the questions based on they the felt *over the course of the past week*. Or if the programme ran over the course of a month, then would ask participants to answer the questions based on how the felt *over the course of the past month*. And so on.

Similarly with the follow-up assessment, ask participants to answer the questions based on how they have felt over the course of whatever time span it has been since the end of the programme.

We have provided examples in the measurement package.

Other questions and things to consider

It's important to let participants know that their responses are entirely optional and that they ignore or skip any questions they do not wish to answer for any reason whatsoever. It's also important that participants know their information and responses are not only confidential, but that their responses are also anonymous. Collection of responses to the questionnaires must be done separately from collection of personal information. The

University of Derby will provide you with the specific logistics of how to collect this information while also attaching an anonymous identification number to it so that participants' responses from pre-assessment can be matched to their post-assessment responses, and if applicable, to their follow-up assessment responses.

Confidentiality *and* anonymity are important principles inherent in research. We realize that as organizations and practitioners you are already well aware of these issues and abide by them. We also just wanted to reinforce and emphasize the importance of this with specific respect to the collection of data.

Because collecting this data is part of a larger project, you will be provided with a consent form for participants to read and sign in conjunction with completing the pre-assessment questionnaires/measures.

For now, however, we'll go over just a few brief guidelines and recommendations.

Date. Please record the date the participant completed each assessment and the date and duration of the programme.

Demographics. You may already do this for your programme. In the context of also asking participants to complete the outcome measures package (on nature connectedness, well-being, and pro-nature behaviour), we would also like the following demographic information: age and gender at a minimum.

Always ask demographics at the end of the outcome measures. That is, any demographic information you collect – including the required demographics of age and gender, or other aspects such as relationship status, why participants have registered for your programme, etc – should be asked either at the end of the outcome measures on a separate page.

Additional questions. If you are collecting a follow-up assessment, it would be helpful if you asked participants *if they have taken part in any similar programme since completing your programme.* When analyzing the data, the research team can then take this account.

The open-ended qualitative question *“Have you changed your routine or behaviours as a result of partaking in our programme? If yes, please provide a brief explanation.”* is also great information to have.

Using a wait-list control group: While a within-participant (gathering pre- and post-assessments from people in your programmes) research design is valid and provides evidence of the impact of your programme, a between-group design – where a wait-list control group is used – provides even stronger evidence. In this design, how much participants change in their levels of nature connectedness, well-being, and pro-nature behaviours from before to after the programme is compared to assessment scores from people who have not participated in your programme.

This can be achieved relatively simply – as noted on the right-hand side of the flow-chart. In this approach, everyone still registers for the programme, everyone still completes the pre-assessment at minimum a day before the program runs. The difference though is while one group of people takes part in the programme, the other group (named ‘the wait-list’ control group) gets put on a waiting list. At the end of the programme, all people (those who took part in the program and those who were on the waiting list) complete the post-assessment. The wait-list group needs to complete the post-assessment at the same time as the people

who took part in the programme. The wait list group can now start the programme and no further assessments are needed on this group.

Extra notes on extremely brief measures

We recognize that very occasionally there may be a situation where you want to ask your participants only a truncated, 2-minute questionnaire. While we do discourage this as it does not provide as accurate an assessment of the impact of your programme, we have provided such a questionnaire here for those rare cases.

One situation where this may occur, is if you want to conduct a follow-up but think that it will be unlikely that the participants in your programme will answer the 10-minute questionnaire that you asked at pre- and post-programme. You may get a stronger response rate if you are only asking for 1 minute of their time-a quick questionnaire consisting of 5 items they could answer on their phones while waiting in line at the bank (for example).

The Short Outcome Measure Questionnaire

1. The INS (to assess nature connectedness)
2. "How happy have you felt the past xx week?"
3. "Over the past xx week, how satisfied have you been with your life as a whole?"
4. "Over the past xx week, to what extent have you felt that the things you do in your life are worthwhile?"
5. "Over the past xx week, how often have you engaged in nature-friendly behaviour (behaviour that promotes biodiversity and conservation of species, and/or reduces your carbon footprint)?"