Coding Manual for "The Nature Voices of People Who Visit Discovery Park: An Interaction Pattern Approach"

Peter H. Kahn, Jr, Elizabeth Lev, Hanzi Chen, Garrett Esperum,
Hannah Piatok, Nathan Aberg, Thea Weiss, Andrew Grueter, and Taylor Koch

Human Interaction with Nature and Technological Systems Laboratory

Department of Psychology & School of Environmental and Forest Sciences

University of Washington

June 15, 2019

Table of Contents:

Abstract:

Interaction with nature is vital for human physical health and mental wellbeing, yet urban development continues to put pressures on natural areas that allow for essential forms of human-nature interaction. Discovery Park, the largest park within Seattle – with over 500 acres and almost 12 miles of walking trails – is a case in point insofar as some Seattle constituents would like to develop some of its open space. **The goal of this research is to give voice to how visitors of Discovery Park interact with nature at the park.** To accomplish this, we applied an Interaction Pattern Approach, where "interaction patterns" are defined as fundamental ways of interacting with nature that are characterized abstractly enough such that many different instantiations of each pattern can be engendered. After their visit to Discovery Park, participants were asked to access our website (what we called "the Nature Language Website") to write a few sentences or paragraphs that described a meaningful experience they had interacting with nature in the park. Participants were also asked a few demographic questions. **This technical report provides our coding manual – our systematic method to code the qualitative data – of people who visited Discovery Park, and who wrote of how they interacted with nature in the park. This technical report thereby provides open access to our core intellectual qualitative work on this project. It can be used by others to conduct related research on how people interact with nature, and especially natural landscapes.**

Introduction:

There is ever increasing empirical support that people benefit physically and psychologically by interacting with nature (see Frumkin et al., 2017 for a review of the literature). At the same time, people in the United States and worldwide are increasingly moving to cities wherein there is little nature to interact with (Hartig & Kahn, 2016), and where existing open natural spaces, such as parks, are often under threat of development. Indeed the threat increases, or development occurs, if the open natural space is perceived to be underutilized or not valued by urban residents.

Our study applied an Interaction Pattern Approach (Kahn et al., 2010, 2012, 2108; Kahn & Weiss, 2017; Kahn, Weiss, & Harrington, 2018) to characterize essential features of human-nature interaction at Discovery Park, the largest park within Seattle, with over 500 acres and almost 12 miles of walking trails. We hypothesized that results from our study will show that people *are* using and valuing Discovery Park in diverse and meaningful ways, and that those ways depend on the large size of the park and its relative wildness. If this hypothesis is supported, the results could be used to counter arguments – often from people that want to develop areas close to or within the park – that the large open space and relative wildness of Discovery Park are not so important to people who use the park.

Beyond simply losing an appreciation of nature, people are losing a *relationship* with nature. This loss fuels a downward cycle in which as fewer people do not have accessible nature to interact with, they care less about nature, resulting in a culture desensitized to the destruction of the environment, further destruction of nature, less

interaction, less caring, and further destruction. Given the rate of urbanization, the baseline for what constitutes "nature" for many people has shifted more towards "domestic" urban nature leading to "environmental generational amnesia," which refers to the idea that "with each ensuing generation, the amount of environmental degradation increases, but each generation in its youth takes that degraded condition as the nondegraded condition [and] the normal experience" (Kahn & Hasbach, 2013, p. 228). Given this phenomenon in which many people do not even know what they are missing as our environment degrades, the results from our study could be used to *deepen* people's relationship with nature through the generation of a "Nature Language" (Kahn et al., 2010). Our intention with this methodology is to provide people with a way to communicate about the deep and meaningful patterns of human interaction with nature, many of which emerged through tens if not hundreds of thousands of years in our evolutionary history that we are quickly losing. This of a way to communicate is based on the idea that if a language dies, so does its surrounding culture. As such, we hope to create a way of speaking about our relationship with nature—a *nature language*—in order to maintain and enrich our connection to the natural world.

Our study partly utilizes a phenomenological approach, in reference to the general idea that "direct sensorial experiences with the phenomenon of nature constitute a foundational source of knowledge, joy, and a full realization of human potential" (Kahn & Hasbach, 2012, p. 119). This approach is applied through our method of collecting first-person narrative data about the participant's experience in Discovery Park, obtained through our Nature Language website (www.naturelanguage.com). Participants were asked to write a few sentences to a few paragraphs describing a meaningful experience

they had interacting with nature in Discovery Park. Unlike other nature-wellness research that often lacks attention to the actual experience of *interaction* that takes place between humans and nature, the proposed research emphasizes the interactive component of human wellbeing through asking participants to reflect specifically on an interaction they had with nature in the park.

The following technical report details our method of coding our qualitative data through an Interaction Pattern Analysis. As constituents of a Nature Language, "Interaction Patterns" are characterizations of essential features of interaction between humans and nature, specified abstractly enough such that countless different embodied versions of each one can be uniquely realized given different types of nature, people, and purposes (Kahn & Weiss, 2017; Kahn et al., 2012; Kahn et al., 2010; Kahn et al., 2018). Though Interaction Patterns are the main component of this research, we have created supplemental coding categories to ensure that the relevant information from the participant's Nature Language is retained as much as possible. Such categories include: "Nature Actions," "Nature Descriptions," and "Psychological Descriptions," as described in this report. Further, our data revealed several recurring themes, coded as: "Absence of Civilization," "Seclusion," "Generating New Social Relationships," "Deepening Existing Social Bonds," "Nature Sparking Memories/Happy Rumination," and, "Biodiversity/Diverse Landscapes," of which definitions are found in their respective chapter.

Coding Manual Development:

This technical report provides the coding manual used to guide the coding of qualitative, narrative data collected from anyone over 18 years old who has visited Discovery Park. This coding manual provides a systematic explanation of how to characterize (and thereby "code") such qualitative data. Our methods were developed both through a data driven and a theoretically guided procedure, reflecting our "bottom-up" and "top-down" research approach.

Data collection began in June 2017, and data was analyzed by a forum of the research team each week to attempt various methods of coding to extract relevant and standardized information to answer our theory-based research questions. Our main research question sought to understand how visitors of Discovery Park interact with nature at the park, which explains why our main level of coding is for Interaction Patterns. Yet through weekly analyses of incoming data, our study team noticed that much of the rich qualities of our participants' narratives were not being coded as Interaction Patterns, simply by virtue of the wide diversity of ways in which people typically write. This observation led us to develop several supplementary levels of coding based on our data to capture the many ways in which participants described their experiences and observations at Discovery Park.

This technical report thereby provides open access to our core intellectual qualitative work on this project. It can be used by others to conduct related research on how people interact with nature, and especially natural landscapes.

Nature Language Coding System:

Overview:

This section outlines the application of our Nature Language coding manual, including the overarching structure of the manual, coding notes, the coding process, and decision rules for each of the coding levels. A "level" of coding is a distinct coding category, such as "Interaction Patterns," "Keystone Interaction Patterns," "Nature Actions," and so on. Additionally, we have provided an explanation for our decisions to either "Link" or "Not-Link" certain levels of coding within our database. A general explanation of "Linked versus Not-Linked" is provided in its own section below, in addition to specific instructions to Link or Not-Link data within each individual level of coding in "Definitions and Decision Rules."

In "Definitions and Decision Rules," we have outlined each level of coding with a clear definition, including its importance and relevance for our study, in addition to outlining decision rules unique to that level. We have provided several examples, with relevant text **bolded** to direct the reader's attention, to assist in the comprehension of the use of this manual in coding Nature Language data specific to Discovery Park.

General Notes:

1. If the participant has written about an experience that did not happen within Discovery Park, do not include their Nature Language or demographic data in your coding.

The Coding Process:

1. Read through the entire Nature Language at least once without coding to get a general sense of the data.
2. Code the Interaction Pattern level first, as the coding of other levels depend on these.
3. Code the remaining levels in the order of your choosing, taking care to decide whether to code certain levels of data as Linked or Not-Linked.
4. After one round of coding, go back through all of your coded data and the respective Nature Language entries to check and make sure nothing was missed when reading the Nature Language.

Linked versus Not-Linked:

Our study team has generated a method to either "Link" or "Not-Link" coded data in all of the supplemental coding levels (excluding Keystone Interaction Patterns and Themes) to a coded IP within the same Nature Language data. Through this method, we aim to retain the already-established relationships, as written by the participants, between these various levels in our coded data. To illustrate, often times the participant has written a response that can be coded in discrete parts across various levels, as we can see in the following example:

"I was walking along the densely wooded trail."

In this example, the coded IP is *walking along trail*, and the coded Nature Description is *densely wooded trail*. From this sentence, it should be clear that "densely wooded trail" is a direct component and additive information to the coded IP "walking along trail," yet this descriptive information (the Nature Description) had to be dropped from the coded IP to fit its standardized form according to the decision rules. Despite the fact that the two parts of this sentence are coded separately, they are still in direct connection to each other, thus why this Nature Description would be coded as Linked to the IP. The established linkage in our database can be useful if we would like to query the database to show us a single IP and all of the other information (from the supplemental coding levels) *across participants* that was a part of the IP. For example, we may want to query the database to pull up all IPs of *walking along trail*, and the many different natural features (Nature Descriptions) that came up for the participants while walking along the trail.

This section is only a general description of our reasoning to establish a Linked versus Not-Linked methodology. As such, refer to the “Linked versus Not-Linked” sections within each of the following outlined coding levels to understand the different reasonings and rules necessary to code data as Linked or Not-Linked across each unique level.

Definitions and Decision Rules:

A. Interaction Patterns

An “Interaction Pattern” is a characterization of essential features of interaction between humans and nature, specified abstractly enough such that countless different embodied versions of each one can be uniquely realized given different types of nature, people, and purposes (Kahn & Weiss, 2017; Kahn et al., 2012; Kahn et al., 2010; Kahn et al., 2018).

As the simplest and most important level of coding, the Interaction Pattern (IP) characterizes any physical and/or sensorial (including any one or combination of the five senses: touch, smell, sight, taste, sound) activity between the participant and nature. We attempt to standardize each participant’s unique way of writing their human-nature interaction through coding the IP in “present progressive tense verb-(preposition)-noun” form (V-(P)-N), where all extra words or information (such as adjectives) are excluded. Though the V-(P)-N is the most typical way an IP is coded, an IP may also be coded in “present progressive verb-(preposition)-noun-preposition-noun” form (V-(P)-N-P-N), as described in the below decision rules.

All verbs must be in reference to the participant’s own action, and any instance where a participant has written about a non-participant enacting an IP is not coded. All nouns (with few exceptions, as outlined in the below decision rules) must be a “nature noun,” meaning that the coded noun must identify a feature of nature, excluding any humans or human artifacts. Aside from changing the tense of the verb written by the participant to its present progressive tense, and aside from specific exceptions that are

outlined below, the coder must use the direct language of the participant so as not to lose any of the intended meaning from their chosen language.

Decision Rules:

Rule 1:

Code every IP in "present progressive tense verb-(preposition)-noun" form, using the participant's own words and only changing the tense of the verb, if needed. In some cases where there is no preposition, code the IP in "present progressive tense verb-noun" form. Remember that the coded noun must be a "nature noun."

a. Example: "While at Discovery Park, I **walked to the beach.**" → coded as *walking to beach.*
b. Example: "I **heard an owl**." → coded as *hearing owl*.
c. Example: "I heard my friend call out to me." → no coded response because there is no nature noun.

Rule 2:

In cases where the IP is phrased in a way such that it does not fit in with the standard V-P-N form, you may code the IP in the V-(P)-N-P-N form. Depending on the participant's Nature Language, there may or may not be a preposition after the first present progressive tense verb coded, yet there must always be a preposition before the nature noun. Note that the *second* noun must be a "nature" noun in order to be coded, whereas the first noun does not have the same restriction.

a. Example: "When my friends and I were hiking at sunset, we had to **pick up our pace on the trail** to make it to our car before dark." → coded as *picking up pace on trail.*

i. Notice how, in this case, there are two prepositions and two nouns. Importantly, the second noun must be a "nature" noun to be coded as an IP.

b. Example: "When we were going to meet our friends at the end of the trail, we **reached our hands for the blackberries** growing nearby." → coded as *reaching hands for blackberries.*

i. Notice how, in this case, there is only one preposition between the first noun and the "nature" noun.

Rule 3:

For the particular phrase of, "hiking down to the beach," only code the second preposition to keep consistent with the standardized form of an IP. Given that the beach will always be a downhill hike, this preposition does not give us any necessary information.

a. Example: "I **hiked with my family down to the beach**." → coded as *hiking to beach*.

Rule 4:

Do not include any adjectives or extra descriptive words or explanations surrounding the IP. For exceptions to this rule, in which we have identified some specific instances of coding descriptive words along with the nature noun, see Rule 9.

a. Example: "I spent some time **looking at the electric green moss** that lined all of the trees surrounding me." → coded as *looking at moss*.

Rule 5:

To fit with the standardized coding, do not include any articles (such as: "the," "a," "an," etc.) in the coded IP.

a. Example: “I **walked on the trail**.” → coded as *walking on trail.*

b. Example: “I **saw an eagle**.” → coded as *seeing eagle*.

Rule 6:

Include the plural form of the noun written in the participant’s Nature Language. The quantitative difference noted by the participant is important to retain in our coding.

a. Example: “I **saw some birds**.” → coded as *seeing birds.*

    i. Notice how the “s” is retained in “birds.”

Rule 7:

If the participant writes about an interaction with nature, but the potential code-able verb is in the form of a noun, change the noun to its appropriate form of a present progressive tense verb to fit the standard IP form.

a. Example: “I took a **breath of fresh air**.” → coded as *breathing fresh air.*

b. Example: “I had many **encounters with wildlife**.” → coded as *encountering wildlife.*

Rule 8:

If there are multiple IPs embedded within one continuous sentence, then parse out each IP and code them individually. If one verb is used with many different nouns, use that same verb for each of the coded IPs.

a. Example: “Out on the water we enjoyed **watching the eagles, herons, waves, and otters**.” → coded as *1. watching eagles. 2. watching herons. 3. watching waves. 4. watching otters.*

b. Example: “We were **walking our dog on a trail in the deep woods**.” → coded as *1. walking dog. 2. walking on trail. 3. walking in woods.*

Rule 9:

Only code interactions with "nature," so the noun (or the *second* noun, if in the V-(P)-N-P-N form) in the IP must specifically be a nature noun. For the purposes of this study, "nature" is defined as non-humans while also excluding any human artifacts.

a. Example: "I walked with a friend" → **no coded response**.

b. Example: "I walked to the lighthouse" → **no coded response**.

c. Example: "I looked for beach glass" → **no coded response**.

Sometimes it is difficult to tell if a word should count as a "nature noun." Thus we have provided a list of some nouns you will encounter in the data that **are coded** as a nature noun, in addition to a list of some nouns that are **not coded** as a nature noun:

1. List of nouns that **are coded** as part of an IP:
   ii. Trail
   iii. Fallen trees and/or limbs*
      →*Change "fallen trees and/or limbs" to *coarse woody debris*
   iv. Field*
      →*If the participant writes, "open field," code as *field*.
   v. Nature
   vi. Breath
   vii. Park*
      →*If the participant writes "Discovery Park," code as *park*.
   viii. View point
   ix. Vista
   x. Dog/dogs
   xi. Fresh air
   xii. Puget Sound or Sound*
      →*If the participant writes "sound" in reference to the Puget Sound, code as *Puget Sound*.
   xiii. Species
   xiv. Species names*
      →*Species proper names count as a nature noun in this level of coding.
         a. Example: "We also found a few Common Goldeneyes," → coded as *finding Common Goldeneyes*.
   xv. Edge*

→*Code ***only if*** the participant specifies that the edge was bounded by what we define as "nature." You must also include the specific edge described by the participant in the coded IP.

a. Example: "I stood on the edge between sand and water" → coded as *standing on edge between sand and water.*

xvi. Path*

→*Code ***only if*** the participant specifies this path was in what we define as "nature."

a. Example: "Exploring along a path where the ferns were taller than my head" → coded as *exploring along path.*
b. Example: "I walked on a path to get to the other side of the park" → **no coded response.**

xvii. Age*

→*Code ***only if*** the age is in reference to an animal. The age must be coded in combination with the nature noun.

a. Example: "We spotted a juvenile barred owl" → coded as *spotting juvenile barred owl.*
b. Example: "We heard the otter pups calling" → coded as *hearing otter pups*.

2. List of nouns that are **not coded** as part of an IP:
   i. View
   ii. Point
   iii. Direction

Rule 10:

Only code any *clear* physical and/or sensorial human-nature interaction, excluding any emotional verbs in the coded IP. Sometimes it is difficult to tell whether or not a verb counts as physical and/or sensorial, thus we have provided a list of some verbs you will encounter in the data that **are coded** in the IP, in addition to a list of some verbs that are **not coded** in the IP.

1. List of some verbs that **are coded** as part of an IP:
   iv. Noticing
   v. Pointing out
   vi. Peeking at
   vii. Traversing
   viii. Exploring
   ix. Discovering

x. Wandering
xi. Finding
xii. Following*
→*Code ***only if*** it is a transitive verb with no preposition. Do not code if is used as an intransitive verb with a preposition.
a. Example: "I followed the trail" → coded as *following trail.*
b. Example: "I learned how to follow in the meadow" → **no coded response**.
xiii. Identifying
xiv. Taking*
→*Code ***only if*** it is connected to a specific physical action with a nature noun.
a. Example: "I took a rock from the beach" → coded as *taking rock.*
b. Example: "I took the trail" → **no coded response** because it does not adequately describe the action.
xv. Looking out
a. Example: "I was looking out across the glassy blue water" → coded as *looking out across water*.
xvi. Gazing out
a. Example: "We gazed out toward the horizon" → coded as *gazing out toward horizon.*
xvii. Bird watching*
→*Code as *watching birds*.

b. List of some verbs that are **not coded** as part of an IP:
i. Experiencing
ii. Being
iii. Spending time
iv. Going
v. Returning
vi. Trying
vii. Enjoying
viii. Marveling
ix. Admiring
x. Learning
xi. Drenched
xii. Sketching
xiii. Photographing
xiv. Communing
xv. Visiting

Rule 11:

Do not code IPs that are not enacted by the participant themselves. In other words, if the participant writes about the actions of someone else they were watching, do not code those IPs. This is because our Nature Language data is linked to the participant's supplied demographic data, thus we want to keep our data consistent.

a. Example: "I watched as **my daughter ran through the meadow** and then disappeared behind the tall grass." → **no coded response**.

Rule 12:

Do not code an IP if it were part of a participant's stated intention, but the participant did not specify that they had actually enacted it. We only want to code participants' interactions with nature when we are certain they had enacted it.

a. Example: "We came to Discovery Park to **walk down to the beach**, but we were running low on time so instead we stayed on the blufftop to enjoy the sunset." → **no coded response.**

    i. Notice how *walking to beach* is not coded because the participant did not specify that they had acted on their intention to walk down to the beach. Rather, the participant wrote about how they stayed on the blufftop instead of walking down to the beach, thus why *walking to beach* should not be included within our data.

Rule 13:

Do not code the exact same IP more than once for one Nature Language data. Sometimes the participant may write about enacting the same IP more than one time in their narrative,

but you should still only code that IP once. If the participant writes multiple IPs that are very similar, but slightly different, still code all of those IPs.

a. Example: “My friend and I **walked on the forested trails** for a bit as we ventured down to the beach. We spent a long time at the beach once we made it down there! Finally as the sun started to set, we decided to head back to our car. The journey wasn’t too long, and we both really enjoyed **walking on the well-maintained trails** the whole way. It was a nice change of pace from the concrete sidewalks in the city!” → coded as *walking on trails*.
    i. Notice how *walking on trails* is only coded once, as you should not code the same IP more than once.
b. Example: “We were **walking along the beach** when the cutest seal pup ran out right in front of us! We couldn’t believe how close it got to us. As we calmed down from the surprise, we decided to keep **walking on the beach** to get to the lighthouse.” → coded as *1. walking along beach. 2. walking on beach.*
    i. Notice how both IPs are coded, as the preposition makes them slightly different. We want to retain the unique qualities of the participant’s choice of language, thus why it is important to code both IPs.

B. Keystone Interaction Patterns

The term “keystone” is generally defined in two ways: 1) “the middle stone in the top of an arch that has a special shape and holds all the other stones in position”, and 2) “the most important part of a plan, idea, etc. on which everything else depends.” Similarly, conservation biologists use the term “keystone species” to refer to a species (such as a top predator) that has a disproportionate benefit to its environment relative to its abundance (Mills et al., 1993; Paine, 1995). For example, if the wolf (a keystone species) is removed from areas such as Yellowstone National Park, then a trophic cascade ensues in which the elk populations grow more abundant, consequentially overgrazing vegetation, eventually leading to the loss of habit, increased erosion, and the loss of biodiversity (Eisenberg, 2013).

Our term “Keystone Interaction Patterns” partly mimics the term keystone species, while broadening its meaning to fit our specific goals. Thus, we define a Keystone Interaction Pattern as “any interaction pattern that plays a disproportionately large role in human-nature interaction because (a) it occurs frequently, (b) it is itself hugely beneficial or meaningful, (c) it engenders dozens or even hundreds of complementary, subsidiary, or overlapping interaction patterns, and/or (d) its loss leads to the subsequent loss of dozens or even hundreds of complementary, subsidiary, or overlapping interaction patterns” (Kahn et al., 2018). As such, we have classified three distinct types of Keystone Interaction Patterns in accordance with the definition provided above:

1. “Most Meaningful Interaction Patterns”
2. “Most Foundational Interaction Patterns”
3. “Most Frequent Interaction Patterns”

These classifications are related to definitions (b), (c and d), and (a) respectively. These Keystone IPs are all vital to human-nature interactions and human wellbeing. To note, the Most Frequent Interaction Pattern is not a part of this coding process, and instead will be calculated as a part of the data analysis after the coding is complete.

General Rule:

All Keystone IPs must be selected from the IPs that have already been coded in the previous step. The coding process for each individual type of Keystone IP is outlined through the following definitions and rules:

1. Most Meaningful Interaction Pattern

The Most Meaningful Interaction Pattern (MMIP) is any IP that the participant clearly stated as a "meaningful" part of their experience in Discovery Park. To select a MMIP, you must first read the entirety of the participant's Nature Language, and then review all of the coded IPs from this participant's Nature Language to identify which IP is regarded as "meaningful" by the participant. Given that participants were prompted to write about a "meaningful experience" they had in Discovery Park, thus making all coded IPs "meaningful" by default, this IP is regarded as *most* meaningful to capture the most special aspects of the Nature Language as defined by the participants.

Sometimes participants do not explicitly use the word "meaningful" to describe their most meaningful experiences, so you should be sensitive to other potential descriptions including phrasings such as "It was unforgettable," "I really loved that," "This made my day," and so on. Still, be careful not to infer too much from the participant's narrative. Most often you will not code a MMIP, given that participants rarely use language that is specific enough to identify an IP as a MMIP.

Example #1:

Nature Language: "We **sat and listened to the waves at the beach** for a while**.** We were also lucky enough to **see a seal in the water**, which was an **especially meaningful experience for us**."

Most Meaningful IP: Example #1	
Interaction Patterns	Most Meaningful IP
1. sitting at beach	
2. listening to waves	
3. seeing seal	x

→ Notice how only the IP "seeing seal" is selected as the MMIP because the participant clearly expressed that this in particular was especially meaningful.

Example #2:

Nature Language: "I have had many experiences at Discovery Park. **One of my favorite moments** was **sitting with my young daughter for a snack break by the pond** below the Daybreak Center. We sat there, **watching the ducks**, **observing the insects**, and then my daughter played a bit around edges. Before heading onward we had the good fortune to **hear owls** caterwauling in the surrounding forest."

Most Meaningful IP: Example #2	
Interaction Patterns	Most Meaningful IP
1. sitting by pond	x

2. watching ducks	x
3. observing insects	x
4. hearing owls	x

→ Notice how all of the coded IPs are selected as the MMIP, because the participant used "one of my favorite moments" to describe the entirety of this meaningful experience.

Example #3:

Nature Language: "I took a **hike with my family this weekend down to the beach** at Discovery Park. It was a beautiful sunny day and we stopped at various points along the way to marvel at the panoramic views of the water, mountains and sky. The breathtaking scenery made me pause to appreciate the natural wonder of the Pacific Northwest. **As I took a deep breath of fresh air and gazed out toward the horizon, it felt spiritual and I am so thankful that I was able to experience this incredible slice of nature with my family**. I feel lucky to live in a part of the country that affords us the ability to enjoy these simple, but important natural experiences. When I got home that evening and thought about my day, I felt great about the physical exercise we did, but I also felt so enriched by the sites we enjoyed during the **hike across the clean, open fields, through the forest to the driftwood lined beach** and back again. I realized it may be one of the largest pieces of land in the City that still has not been hurt by development and I hope it always stays that way. I can't wait for our next visit!"

Most Meaningful IP: Example #3	
Interaction Patterns	Most Meaningful IP

1. hiking to beach	
2. breathing fresh air	x
3. gazing out toward horizon	x
4. hiking across fields	
5. hiking through forest	

→ Notice how both *breathing fresh air* and *gazing out toward horizon* are coded as the MMIP. Though the participant did not clearly state that these were the "most meaningful," their mention of feeling spiritual and thankful for the experiences associated with these IPs provide the coder with enough information to classify both IPs as MMIPs.

2. Most Foundational Interaction Pattern

The Most Foundational Interaction Pattern (MFIP) is the basis for other IPs which are coded from the same Nature Language data. In other words, the MFIP engenders the enactment of other subsequent IPs, and if the MFIP were taken away or no longer enacted, the other IPs which are based on the MFIP would assumedly be lost. Examine the context of the participant's Nature Language carefully to determine which IP works as a foundation for the other IPs. Again, do not infer too much from what the participant wrote. Sometimes there will not be a coded MFIP in a given Nature Language.

Example #1:

Nature Language: "I have had many experiences at Discovery Park. One of my favorite moments was **sitting with my young daughter for a snack break by the pond** below the Daybreak Center. We sat there, **watching the ducks**, **observing the insects**, and then my

daughter played a bit around edges. Before heading onward we had the good fortune to **hear owls** caterwauling in the surrounding forest."

Most Foundational IP: Example #1	
Interaction Patterns	Most Foundational IP
1. sitting by pond	x
2. watching ducks	
3. observing insects	
4. hearing owls	

→ Notice how only the IP "sitting by pond" is selected as the MFIP, because if the participant had not sat by the pond then they likely would not have watched ducks, observed insects, or heard owls. Therefore, "sitting by the pond" serves as a foundation for the other coded IPs.

Example #2:

Nature Language: "I took a **hike with my family this weekend down to the beach** at Discovery Park. It was a beautiful sunny day and we stopped at various points along the way to marvel at the panoramic views of the water, mountains and sky. The breathtaking scenery made me pause to appreciate the natural wonder of the Pacific Northwest. As I **took a deep breath of fresh air** and **gazed out toward the horizon**, it felt spiritual and I am so thankful that I was able to experience this incredible slice of nature with my family. I feel lucky to live in a part of the country that affords us the ability to enjoy these simple, but important natural experiences. When I got home that evening and thought about my day, I felt great about the physical exercise we did, but I also felt so enriched by the sites

we enjoyed during the **hike across the clean, open fields, through the forest to the driftwood lined beach** and back again. I realized it may be one of the largest pieces of land in the City that still has not been hurt by development and I hope it always stays that way. I can't wait for our next visit!"

Most Foundational IP: Example #2	
Interaction Patterns	Most Foundational IP
1. hiking to beach	x
2. breathing fresh air	
3. gazing out toward horizon	
4. hiking across fields	
5. hiking through forest	

→ Notice how *hiking to beach* is the only IP chosen as the MFIP because without having hiked to the beach, the participant would likely not have had the same experience of *breathing fresh air*, *gazing out toward the horizon*, *hiking across the fields,* or *hiking through the forest.* Thus, *hiking to beach* serves as a foundational IP that engenders the enactment of the other coded IPs.

C. Nature Action

A "Nature Action" is a happening initiated by a nonhuman cause that is meant to capture the overarching scenario surrounding the "nature" described in the participant's Nature Language. Similar to a human-nature interaction, in which the human and nature interact with each other, a Nature Action characterizes when nature is "interacting" with other nature, as described by the participant. Specifically, a Nature Action can code: 1) an interaction between at least two biotic organisms (i.e. *eagle catching fish*), 2) an interaction between biotic organisms and abiotic components (i.e. *crab hiding under rock*), 3) an interaction between at least two abiotic components (i.e. *rocks falling over cliffs*), and 4) a general action of one biotic organism or abiotic component on its own (i.e. *eagle flapping wings; blooming flowers*). In theory, the Nature Action would have happened regardless of the human being there to observe it, though it is possible that the nature of observation could have influenced the Nature Action anyway. In short, the Nature Action is meant to capture the rich and diverse ways in which people notice and characterize aspects of their surrounding natural environment.

When coding the Nature Action, try to distill the participant's written scenario to only its essential features. Always try to code the Nature Action as close to the participant's original language as possible; typically, you should only alter their language to change the relevant verb to its present progressive tense.

Decision Rules:

Rule 1:

If necessary, make sure to change the tense of the action so that the relevant verbs are in their present progressive tense ("-ing") form.

a. Example: “My friend and I made our way to Discovery park during a summer sunset. My dog scattered away from us as we walked through trails. We’d chat as **a light breeze moved through the trees**. We crossed paths with a few people and made sure to say hello. With kind smiles to offer, we learn mannerisms of nature. We are not much for hellos downtown compared to the trails. We very quickly learn the mannerisms when immersed in nature. As simple as offering kind smiles and salutations, it seems we can give as much as nature does.” → coded as *light breeze moving through trees*.
    i. Notice how this is an example of a biotic and abiotic interaction within nature, between the trees and the breeze respectively.
b. Example: “I was running in Discovery Park last week....and it was magical. The smell of the leaves, the dirt trail, the **sun dappling through the trees**.” → coded as *sun dappling through trees*.
    i. Notice how the participant has already written the verb “dappling” in its -ing form, so here you do not have to change the tense.

Rule 2:

Like coding the IPs, drop all articles and unnecessary words in your coding (see Interaction Pattern Rule 4). Your goal is to *distill* the participant’s narrative to its essential features, while trying to maintain a balance of keeping the richness of their original word choices.

a. Example: “I have had many experiences at Discovery Park. One of my favorite moments was sitting with my young daughter for a snack break by the pond below the Daybreak Center. We watched the ducks, sketched the

pond, and my daughter played a bit around edges. Before heading onward we had the good fortune to hear **owls caterwauling in the surrounding forest**." → coded as *owls caterwauling in surrounding forest*.

b. Example: "Walking to the beach from the south entrance, quite a while ago, I watched a **pileated woodpecker up close hammering on a tree**." → coded as *pileated woodpecker hammering on tree.*

    i. Notice how the words "up close" were dropped from the coded Nature Action. These words were dropped because they are not necessary in understanding the overarching interaction between the woodpecker and the tree, and they were likely in reference to the proximity of the woodpecker to the participant.

c. Example: "We came to Seattle to visit our son who is going to grad school at UW. We took an Uber to the park, walked the park and then walked to downtown Seattle. Enjoyed watching a **flight of birds over the water** - looked like choreography as they moved together." → coded as *flight of birds over water.*

    i. Notice how there is no verb in this Nature Action. Thus, the only modifications to the participant's original language are dropping the articles.

d. Example: "I ride my bicycle to the park often, and love to sit on a driftwood log and watch the **sanderlings play keep away with the waves**. One morning I saw a **bald eagle snatch a fish out of the waves** just off the

lighthouse point." → coded as 1) *sanderlings playing keep away with waves*, and 2) *bald eagle snatching fish out of waves*.

i. Notice how the second coded Nature Action excluded the portion, "just off the lighthouse point" because this information is not necessary in understanding the context of the nature scenario.

Linked versus Not-Linked Nature Action:

The decision to either "Link" or "Not-Link" a Nature Action depends on whether it is literally linked to a coded IP, meaning that the Nature Action is extra information that is directly related to the coded IP. If there are no coded IP's in a given Nature Language, then all coded Nature Actions are automatically Not-Linked, because there is no IP to which you would link the two. Usually the IP and Nature Action are Linked if they are written within the same sentence. However, sometimes the IP and Nature Action are in two separate sentences and can still be coded as Linked if the Nature Action is clearly additive information to the IP. If the Nature Action is not in the same sentence as the IP, use your discretion to decide whether the Nature Action is *directly* a part of the coded IP, and naturally flows in its addition to the IP. In other words, a Nature Action is Not-Linked if: 1) there is no coded IP, or 2) there are coded IP's, but the Nature Action is describing a separate occurrence unrelated to the coded IP's. Note that in some cases the Nature Action may be additive information to multiple of the coded IP's in a given Nature Language, in which case you would link the Nature Action to each IP you deem fit.

Example #1:

Nature Language: "I went for a walk to the lighthouse, always a favorite spot but particularly so on a day when I could feel the cool **air blowing from the west** after 5 days

of smoky air in Seattle. I stood on the beach savoring the feeling of the **air that was blowing the smoke away**."

Linked vs. Not-Linked Nature Action (NA): Coding Example #1		
Interaction Patterns	Linked NA	Not-Linked NA
1. feeling air	air blowing from west	
2. standing on beach	air blowing smoke away	

→ Notice how the linked Nature Action, "*air blowing from west*" is very clearly a continuation of the coded IP, "*feeling air*," thus a good indication of the correct decision to link the two data. The Nature Action, "*air blowing smoke away*," is also additive information to both of the coded IP's, yet is more specifically adding to *standing on beach* and not *feeling air*, thus why those two are linked.

Example #2:

Nature Language: "I was running in Discovery Park last week....and it was magical. The smell of the leaves, the dirt trail, the **sun dappling through the trees**. Felt at peace."

Linked vs. Not-Linked Nature Action (NA): Coding Example #2:		
Interaction Patterns	Linked NA	Not-Linked NA
1. running in Discovery Park	sun dappling through trees	
2. smelling leaves		

→ Notice how the Nature Action and IP are not in the same sentence, yet in this example they are still Linked. In this case, the "sun dappling through trees" is something that the

participant noticed during their experience of *running in Discovery Park*, which is a clear enough connection to link the two data.

Example #3:

Nature Language: "My friend and I made our way to Discovery park during a summer sunset. My dog scattered away from us as we walked through trails. We'd chat as a **light breeze moved through the trees**. We crossed paths with a few people and made sure to say hello. With kind smiles to offer, we learn mannerisms of nature. We are not much for hellos downtown compared to the trails. We very quickly learn the mannerisms when immersed in nature. As simple as offering kind smiles and salutations, it seems we can give as much as nature does."

Linked vs. Not-Linked Nature Action (NA): Coding Example #3:		
Interaction Patterns	Linked NA	Not-Linked NA
1. walking through trails	light breeze moving through trees	

→ Notice how the IP, *walking through trails*, is a Foundational IP, meaning that the "light breeze moving through trees" happened while the participant was walking through the trails. Therefore, this Nature Action is adding information to the coded IP, which justifies the linkage of the two data.

D. Nature Description

A "Nature Description" is the portion of the participant's Nature Language that directly describes any of the nature identified by the participant. In contrast to the "Nature Action,"—which describes either an interaction between different components of nature or a general action happening within nature—the Nature Description is relatively stationary. This level of coding captures the rich ways in which participants notice and describe their surrounding environment, thus a form of engagement.

When coding the Nature Description, you want to stay as close to the participant's original language as possible. Thus there is no standardized form for this category, and most often the coded Nature Description will be a direct excerpt from the participant's Nature Language. If you encounter a "nature-noun" without any extra descriptive words or adjectives, then it does not have enough extra descriptive information to code in this category.

Decision Rules:

Rule 1:

Include the "nature noun" within your coded Nature Description. In other words, don't only code the description itself, but also include the object of the description. Similarly, if the participant writes about a nature-noun without any descriptive words or adjectives, then do not code it.

a. Example: "The discovery of……**awesome tree-lined paths**, the **distant mountains**, and, of course, the water, the Sound, ships and ferries, and sail boats so very much stimulated peace of mind to me." → coded as *"awesome tree-lined paths"* and *"distant mountains."*

i. Notice how the adjectives (“awesome,” “tree-lined,” and “distant”) are still coded along with their respective nature-nouns (“paths,” and “mountains”).

ii. Notice how the nouns “water,” “Sound” (meaning the Puget Sound), “ships and ferries,” and “sail boats” are not coded because they do not have any additive descriptions.

Rule 2:

When coding, drop all articles from the Nature Description. Given that the Nature Description does not have a standardized form, you may encounter situations in which the participant has used prepositions within their description of nature. In these cases, include the prepositions in your coded response.

a. Example: “We walked about 4 miles along the main trails branching from the south parking lot, along the ridge, down to the beach and then back to our car through the woods. Having access to the park is important to me as I feel happiest when I am outside, in the mountains, and I am not always able to get to the mountains. Even when I am not in the park it is important to me as I lean on past experiences in the park to help me feel centered and relaxed. Things I noticed:

birds -- identified cormorants, eagles, herons, gulls

electric green moss on slick dark wood

sunshine over smooth seas -- made me think about what it would have been like to be a Native American living here before white people

arrived, imagined paddling from island to island…" → coded as 1) *electric green moss on slick dark wood,* and 2) *sunshine over smooth seas*.

i. Notice how in this example, "moss" is a nature-noun, and "electric" and "green" are two adjectives used to describe this nature-noun. The preposition and descriptive words, "on slick dark wood," provide further information about where the "moss" is, thus including the entirety of *"electric green moss on slick dark wood"* within the coded Nature Description. As for the other Nature Noun, "sunshine," the participant did not use any adjectives to describe it directly, but used "over smooth seas" to give related information, therefore this is coded as "sunshine over smooth seas."

b. Example: "We are visiting Seattle from Chicago and wanted to take a nature walk so found Discovery Park. We started at the Visitors Center then walked the Loop Trail to the North Beach Trail where we walked on the beach. **It was an overcast day and the water was very calm. The sound of the waves was calming..** The hike in the wooded glens was very peaceful, serene, and beautiful. We saw several **old growth trees**. **The air smelled earthy and the foliage was extremely lush**. We circled back to the Visitors Center via the Loop Trail and after 2.5 hours of hiking, headed back to our hotel, weary and tired and appreciative of the natural beauty we experienced." → code as 1) *overcast day*, 2) *water was very calm*, 3) *sound of waves was calming*, 4) *old growth trees*, 5) *air smelled earthy*, 6) *foliage was extremely lush*.

Rule 3:

Do not code quantities within the Nature Description category. We are more interested in the way people are using language to describe their environment, rather than their quantitative notations of the nature they are describing.

a. Example: "We took some trails down to the beach, and when we finally got there we were in awe over the **many driftwood logs** we saw washed up on the shore." → **no coded response**.
    i. Notice how "many" is an indicator of quantities, therefore this is not coded as a Nature Description.
b. Example: "The hike in the wooded glens was very peaceful, serene, and beautiful. We saw several **old growth trees**." → coded as *old growth trees*.
    i. Notice how "several" is omitted from the coded response, because it is an indicator of quantities.

Linked versus Not-Linked Nature Description:

The decision to either "link" or "not-link" a Nature Description depends on whether it is literally linked to a coded IP, meaning that the Nature Description is extra information that is directly related to the coded IP. If there are no coded IP's in a given Nature Language, then all coded Nature Descriptions are automatically Not-Linked, because there is no IP to which you would link the two. Usually the IP and Nature Description are Linked if they are written within the same sentence. However, sometimes the IP and Nature Description are in two separate sentences and can still be coded as Linked if the Nature Description is clearly additive information to the IP. If the Nature Description is not in the same sentence as the IP, use your discretion to decide whether the Nature Description is a

direct component of the coded IP, and naturally flows in its addition to the IP. In other words, a Nature Description is Not-Linked if: 1) there is no coded IP, or 2) there are coded IP's, but the Nature Description is describing a separate occurrence unrelated to the coded IP's. Note that in some cases the Nature Description may be additive information to multiple of the coded IP's in a given Nature Language, in which case you would link the Nature Description to each IP you deem fit.

Example #1:

Nature Language: "Seeing the extreme amount of **fine dust on all the leaves** during a smoke walk there in mid-July. I drew a finger over a leaf and exposed the bright green below. On the same walk, I saw plants in need of water."

Linked vs. Not-Linked Nature Description (ND): Coding Example #1		
Interaction Patterns	Linked ND	Not-Linked ND
1. seeing dust	dust on all leaves	

→ Notice how the IP and Nature Description are within the same sentence, and the Nature Description is a continuation of the coded IP. Thus, the two are linked.

→ Notice how the words "during a smoke walk there in mid-July" are not coded in the Nature Description because they are not necessary in describing the nature or understanding the overall scenario.

Example #2:

Nature Language: "We are visiting Seattle from Chicago and wanted to take a nature walk so found Discovery Park. We started at the Visitors Center then walked the Loop Trail to the North Beach Trail where we walked on the beach. It was an **overcast day** and **the water was very calm**. The sound of the waves was calming.. The hike in the wooded

glens was very peaceful, serene, and beautiful. We saw several **old growth** trees. The **air smelled earthy** and the **foliage was extremely lush**. We circled back to the Visitors Center via the Loop Trail and after 2.5 hours of hiking, headed back to our hotel, weary and tired and appreciative of the natural beauty we experienced."

Linked vs. Not-Linked Nature Description (ND): Coding Example #2		
Interaction Patterns	Linked ND	Not-Linked ND
1. walking trail	overcast day	
2. walking on beach	overcast day; water was very calm;	
3. hiking in wooded glens	overcast day; foliage was extremely lush	
4. seeing trees	overcast day; old growth	
5. smelling air	overcast day; air smelled earthy	

→ Notice how the word "beautiful" is not coded as a Nature Description, because it is descriptive of the hike and not a nature noun itself.

→ Notice how "overcast day" is linked to all of the coded IP's because it was an overarching part of their experience.

Example #3:

Nature Language: "I took a hike with my family this weekend down to the beach at Discovery Park. It was a **beautiful sunny day** and we stopped at various points along the

way to marvel at the **panoramic views of the water, mountains and sky**. The **breathtaking scenery** made me pause to appreciate the natural wonder of the Pacific Northwest. As I took a deep breath of fresh air and gazed out toward the horizon, it felt spiritual and I am so thankful that I was able to experience this incredible slice of nature with my family. I feel lucky to live in a part of the country that affords us the ability to enjoy these simple, but important natural experiences. When I got home that evening and thought about my day, I felt great about the physical exercise we did, but I also felt so enriched by the sites we enjoyed during the hike across the **clean, open fields**, through the forest to the **driftwood lined beach** and back again. I realized it may be one of the largest pieces of land in the City that still has not been hurt by development and I hope it always stays that way. I can't wait for our next visit!"

Linked vs. Not-Linked Nature Description (ND): Coding Example #3		
Interaction Patterns	Linked ND	Not-Linked ND
1. hiking to beach	beautiful sunny day; panoramic views of water, mountains, and sky; breathtaking scenery; driftwood lined beach	
2. breathing fresh air		
3. gazing toward horizon		
4. hiking across fields	clean, open fields	
5. hiking through forest		

Example #4:

Nature Language: "I went for a trail run with some fellow students I met. This place gave me somewhere to escape the city and to be submersed in nature, just what I needed to recenter, refocus, and reengage with the world, my studies, and my peers. It gave us a place to run on beautiful, soft trails and to get to know each other better, improving our mental, physical, and social healths."

Linked vs. Not-Linked Nature Description (ND): Coding Example #4:		
Interaction Patterns	Linked ND	Not-Linked ND
1. running on trail	beautiful, soft trails	

Example #5:

Nature Language: "I often walk Discovery Park, using various different paths and loops. Every time I walk in Discovery Park it brings new meaning and perspective to the point in life that I happen to be at. Just being in the presence of our natural world in this special place - un-paved, un-landscaped, and un-crowded brings me back to what is important - brings me back to balance. I will share with you that there is one place I visit that has special meaning to me – it's a **high meadow that overlooks the bay**. This is **quiet open place** and when I'm here, I most often think of and remember my Mom who passed not long ago. This meadow was one of the stops on my first hike in the park after my Mom passed last November...I spent a long time here remembering her. And, while I was looking out on the water a long Cruise ship was pulling out on its way to Alaska...I had just taken my Mom on our first cruise - to see Alaska - a few months before her death - and we had sailed on our ship together in this same pass. So now, this stop is always a time for me to check in with my Mom and my remembrances of her."

Linked vs. Not-Linked Nature Description (ND): Coding Example #5:		
Interaction Patterns	Linked ND	Not-Linked ND
1. walking in Discovery Park		
2. looking out on water	high meadow that overlooks bay; quiet open place	

E. Psychological Description

A "Psychological Description" is the portion of the participant's Nature Language that describes their personal reflections on and feelings about their experience in Discovery Park, including cognitive, emotional, and psychological experiences. The Psychological Description is in contrast to the physical/sensorial experiences that are coded as IPs. There are three possible forms that a Psychological Descriptions could take: 1) the participant's description of their personal feelings, 2) the participant's description of an action, where the verb is more "psychological/emotional" oriented (though this is not always the case), as opposed to the "physical/sensorial" verbs coded within Interaction Patterns, and 3) the participant's description of the general feelings surrounding their larger experience described in their Nature Language. The first and second types are almost always founded upon a verb (i.e. "*I **felt** happy*" and "*I **marveled** at the views*", respectively), and the third type is almost always simply a list of adjectives or descriptive words (i.e. "*my walk was **quiet and peaceful***"). Notice how the first two forms are in reference to the participant's self, and the third form is in reference to the participant's more general experience. Sometimes a Psychological Description could fit into multiple of the above forms, but these are meant to be general guidelines, so you do not have to worry about classifying a Psychological Description as only one of the outlined forms.

When coding, try to stay as close to the participant's original language as possible. In cases where the Psychological Description is founded upon a verb (i.e. "*I **felt** happy*"), change it to the present progressive tense, "-ing," form to keep in line with the standard Interaction Pattern form. In cases where the Psychological Description is simply adjectives, it is unlikely that you should change their language at all.

Unlike the other coding levels, the Psychological Description can include information that did not necessarily happen within the park as long as the Psychological Description is still a reflection on the participant's experience within the park. This is because our psychological response to interacting with nature does not always end when you leave; rather, the effects and reflections can linger long after the human-nature interaction.

Decision Rules:

Rule 1:

If necessary, make sure to change the tense of the relevant verb so they are in their "-ing" form.

a. Example: "I took a hike with my family this weekend down to the beach at Discovery Park. It was a beautiful sunny day and we stopped at various points along the way to **marvel at the panoramic views of the water, mountains and sky**. The breathtaking scenery made me pause to **appreciate the natural wonder of the Pacific Northwest**." → coded as 1) *marveling at panoramic views of water, mountains and sky*, and 2) *appreciating natural wonder of Pacific Northwest*.

    i. Notice how both of these coded Psychological Descriptions are of the second identified form, in which the participant is describing an interaction they had with nature that is more emotionally oriented. The verbs "marveling" and "appreciating" are not specific enough to be coded as Interaction Patterns, but should be coded as Psychological Descriptions.

b. Example: “I have come to Discovery Park ever since I was young and have **been in awe of its natural beauty** for 20 years. Every time I visit the park, I **experience nature in a new and breathtaking way**.” → coded as 1) *being in awe of natural beauty*, and 2) *experiencing nature in new and breathtaking way*.

   i. Notice how the first coded Psychological Description does not use an “emotional” verb, yet this is still coded because of the word “awe” which gives the phrase enough of an emotional/psychological orientation.

Rule 2:

If in any of the forms you encounter an adverb that is taking the place of the emotional/psychological adjective, then change the adverb to its respective adjective.

a. Example: “I **happily** walked around.” → code as *happy*.

b. Example: “I was **excitedly** hiking.” → code as *excited*.

Rule 3:

If the participant writes a Psychological Description in what appears to be either its first or its third form, in which they are describing their general experience or feelings, only code the relevant adjectives, nouns (that function similar to adjectives), and descriptive words without the extra information.

a. Example: “I took my visiting relatives on a relaxed hike through the trees and out towards the beach so that they could experience some of the beautiful nature here in the PNW. **It was just so serene and relaxing**.” → coded as *serene and relaxing*.

b. Example: “It was an overcast day and the water was very calm. The sound of the waves was calming.. The **hike in the wooded glens was very peaceful, serene**, and beautiful.” → coded as 1) *peaceful*, *serene*.

   i. Notice how “The sound of the waves was calming” is **not coded** as a Psychological Description, because this is describing the “nature” in the scenario and should be coded as a Nature Description.

   ii. Notice how “beautiful” is **not coded** within the Psychological Description, because it’s more of a physical/aesthetic description rather than an emotional description.

Linked versus Not-Linked Psychological Description:

The decision to either “link” or “not-link” a Psychological Description depends on whether it is literally linked to a coded IP, meaning that the Psychological Description is extra information that is directly related to the coded IP. If there are no coded IPs in a given Nature Language, then all coded Psychological Descriptions are automatically not-linked, because there is no IP to which you would link the two. Usually the IP and Psychological Description are linked if they are written within the same sentence, yet sometimes the IP and Psychological Descriptions are in two separate sentences and can still be coded as Linked if the Psychological Description is clearly additive information to the IP. If the Psychological Description is not in the same sentence as the IP, use your discretion to decide whether it is directly a part of the coded IP, and naturally flows in its addition to the IP. In other words, a Psychological Description is Not-Linked if: 1) there are no coded IP’s, or 2) there are coded IP’s, but the Psychological Description is describing a separate occurrence unrelated to the coded IP’s. Not-Linked Psychological Descriptions can still be

additive information to Nature Actions, and/or Nature Descriptions in addition to providing some background information to the participant's experience in Discovery Park. Note that in some cases the Psychological Description may be additive information to multiple of the coded IP's in a given Nature Language, in which case you would link the Psychological Description to each IP you deem fit.

Example #1:

Nature Language: "We are visiting Seattle from Chicago and wanted to take a nature walk so found Discovery Park. We started at the Visitors Center then walked the Loop Trail to the North Beach Trail where we walked on the beach. It was an overcast day and the water was very calm. The sound of the waves was calming… The hike in the wooded glens was very **peaceful, serene**, and beautiful. We saw several old growth trees. The air smelled earthy and the foliage was extremely lush. We circled back to the Visitors Center via the Loop Trail and after 2.5 hours of hiking, headed back to our hotel, **weary and tired** and **appreciative of the natural beauty we experienced**."

Linked vs. Not-Linked Psychological Description (PD): Coding Example #1		
Interaction Patterns	Linked PD	Not-Linked PD
1. walking trail		weary and tired; appreciating natural beauty
2. walking on beach		
3. hiking in wooded glens	peaceful, serene	
4. seeing trees		
5. smelling air		

→ Notice how "weary and tired" and "appreciating natural beauty" did not necessarily happen while the participant was in the park, but they are still coded because they were reflections on an experience that happened within the park.

Example #2:

Nature Language: "I took a hike with my family this weekend down to the beach at Discovery Park. It was a beautiful sunny day and we stopped at various points along the way to **marvel at the panoramic views of the water, mountains and sky**. The breathtaking scenery made me pause to **appreciate the natural wonder of the Pacific Northwest**. As I took a deep breath of fresh air and gazed out toward the horizon, it **felt spiritual** and **I am so thankful that I was able to experience this incredible slice of nature with my family**. **I feel lucky to live in a part of the country that affords us the ability to enjoy these simple, but important natural experiences**. When I got home that evening and thought about my day, **I felt great about the physical exercise we did**, but **I also felt so enriched by the sites we enjoyed during the hike across the clean, open fields, through the forest to the driftwood lined beach and back again**. I realized it may be one of the largest pieces of land in the City that still has not been hurt by development and I hope it always stays that way. I can't wait for our next visit!"

Linked vs. Not-Linked Psychological Description (PD): Coding Example #2		
Interaction Patterns	Linked PD	Not-Linked PD
1. hiking to beach	marveling at panoramic views of water, mountains, and sky; appreciating natural wonder of Pacific Northwest;	feeling lucky to live in part of country that affords ability to enjoy natural experiences;

	feeling enriched by sites	feeling great about physical exercise
2. breathing fresh air	feeling spiritual; being thankful for experiencing incredible slice of nature with family	
3. gazing toward horizon	feeling spiritual; being thankful for experiencing incredible slice of nature with family	
4. hiking across fields	feeling enriched by sites	
5. hiking through forest	feeling enriched by sites	

→ Notice how the Nature Description, "*feeling enriched by sites,*" is linked to the IPs, "*hiking to beach*," "*hiking across open fields*," and "*hiking through forest,*" because the participant had listed these after their statement of feeling enriched. Thus, when coding this Nature Description, you should enter the data in the three boxes that are linked with the respective IP.

F. Time

"Time" is meant to indicate the temporal aspect of the participant's experiences in Discovery Park, essentially answering the question of when their described experiences took place. Participants can use a wide variety of language to indicate Time, including language that identifies the year, season, month, day, holidays, specific time of day (sunrise, sunset, midday, noon, etc.), and others. Use only the participant's exact language when coding for Time, and directly excerpt the word or phrase from the participant's Nature Language. Coding for Time can give researchers an understanding of what times of the year or day afford particularly interesting or meaningful human-nature interactions.

As detailed below, Time is coded as either "Linked" or "Not-Linked." Linked Time directly describes an already-coded IP, whereas Not-Linked Time directly describes already coded Nature Actions, Nature Descriptions, and/or Psychological Descriptions. Sometimes the participant has written an indicator of time, but do not code these words as Time if their description is referencing a frequency/duration, it is too vague, or it has *no* connection to already-coded Nature Actions, Nature Descriptions, and/or Psychological Descriptions. Refer to the rules outlined below to guide your coding decisions for Time.

Decision Rules:

Rule 1:

Use the participant's own language that describes Time and omit any unnecessary adjectives or descriptive words that have nothing to do with the indicated Time.

a. Example: "Beautiful **Sunday morning** run with friend and Dog at Discovery Park!" → coded as *Sunday morning.*

i. Notice how "*Sunday morning*" is coded as the Time, and how the extra description, "beautiful," is omitted. This is because the word "beautiful" is an adjective describing this specific time, but has nothing to do what the time itself it is.

b. Example: "Seeing the extreme amount of fine dust on all the leaves during a smoke walk there in **mid-July**. I drew a finger over a leaf and exposed the bright green below. On the same walk, I saw plants in need of water. I attached the hoot below." → coded as *mid-July*.

c. Example: "We were planning on going to Volunteer Park Conservatory but realized that it's **President's Day** so the conservatory is closed. Thus, we decided to go to Discovery Park for a walk about instead. It was nice to be out in nature on a sunny, albeit cold, day." → coded as *President's Day*.

Rule 2:

Do not code words that may at first appear to talk about time, but actually are used to indicate the frequency or duration of whatever is being described.

a. Example: "I have visited Discovery Park an average of **once per month** since my move to Seattle in **2001**. A very special person, my son, took me there and provided a tour, mostly of the military areas of the park, and explanations of areas available for parking lots and their access to the trails…" → coded as *2001*.

i. Notice how it seems like the phrase "once per month" is talking about time, but it is not coded because it does not indicate a time specific to their experience.

b. Example: “I walked with a friend from out of town. We sat and listened to the peaceful waves at North Beach for **quite some time** before continuing around the loop. It is my favorite oasis within the city.” → **no coded response for Time**.

    i. Notice how “quite some time” is an indication of the duration of their experience, not a specific indication of the time of their experience. Therefore, “quite some time” is not coded.

Rule 3:

Do not code indicators of time that are too vague to provide any useful information. Sometimes participants may indicate time through expressions like “last week,” “last year,” “two month ago,” and others, yet these responses would not provide any significant meaning if coded.

a. Example: “I use the park **1-4 times per week** for walking and bird watching. **Last week** we also walked in the tide pools. I use the south parking lot, walk the loop trail, and the south meadow and parade ground.” → **no coded response for Time.**

    i. Notice how neither “1-4 times per week” nor “last week” are coded as Time. The phrase “1-4 times per week” is an indicator of frequency, which is not coded under the previous rule. The phrase “last week” is too vague to identify a specific time of their experience, therefore it is not coded as Time.

Rule 4:

Do not code Time that has no relationship to either a coded IP or coded Nature Action, Nature Description, or Psychological Description. In other words, Time must be coded as

either Linked (directly describing an IP) or Not-Linked (directly describing a Nature Action, Nature Description, or Psychological Description), as outlined in the "Linked versus Not-Linked" section.

a. Example: "I decided to go to the park over the **summer** to hang out with some friends." → **no coded response for Time.**
    i. Notice how there are no IPs, Nature Actions, Nature Descriptions, or Psychological Descriptions in this Nature Language, thus "summer" is not coded as it does not provide useful information for the purposes of our research.
b. Example: "We started our day in the **early morning** at Discovery Park. It wasn't until **nighttime** when it got really dark outside that we started to feel more connected to the nature around us." → coded as *nighttime*.
    i. Notice how "early morning" is not directly describing either a coded IP or coded Nature Action, Nature Description, or Psychological Description, thus why it is **not coded**. "Nighttime" is the only coded Time because it is describing both a Nature Description (*"dark outside"*) and a Psychological Description (*"feeling more connected to nature around us"*).
c. Example: "My wife and I walk the loop trail every other day (rain or shine). It's a wonderful outdoor experience, lots of solitude and seeing the seasons change. I have watched, with increasing concern, the substantial build-up of fallen trees and limbs, which appear to be a real fire hazard. This area is tinder dry in the **summer**." → **no coded response for Time.**

i. Notice how there is **no coded** Time in this example. Though the participant mentioned "summer," this time is not directly connected to an IP, Nature Action, Nature Description, or Psychological Description, therefore it does not provide useful information for our study.

Linked versus Not-Linked Time:

The decision to either "link" or "not-link" Time depends on whether it is directly connected to a coded Interaction Pattern or to a coded Nature Action, Nature Description, and/or Psychological Description, respectively. In the former case, you would establish a linkage in the database between Time and the coded IP. In the latter case, you would code Time as Not-Linked, even though Not-Linked for this level of coding requires and implies a linkage to a Nature Action, Nature Description, and/or Psychological Description. If the participant has written an indicator of time, yet it is not additive information to either a coded IP, Nature Action, Nature Description, and/or Psychological Description, then do not code it as Time. "Time" that is not linked to any of the four previously listed coding levels is not useful information for our study and can bias our data if included.

Example #1:

Nature Language: "Beautiful **Sunday morning** run with friend and Dog at Discovery Park!"

Linked versus Not-Linked Time: Coding Example #1		
Interaction Pattern	Linked Time	Not-Linked Time
1. running at park	Sunday morning	

→ Notice how "Sunday morning" is directly describing the time that the participant was "running at park," thus why "Sunday morning" is coded as Linked.

Example #2:

Nature Language: "I went to the park on a random **Tuesday night** with my friend because we feel like more animals will come out when there aren't too many people crowding the park. Sure enough, after walking around for some time, we were in complete awe as a huge owl flew right over our heads!"

Linked versus Not-Linked Time: Coding Example #2		
Interaction Pattern	Linked Time	Not-Linked Time
		Tuesday night

→ Notice how "Tuesday night" is coded as Not-Linked because it is directly connected to a Psychological Description (*being in complete awe*), a Nature Description (*huge owl*), and a Nature Action (*owl flying*).

G. Location

"Location" is an indication of the spatial aspect of the participant's experience within Discovery Park, essentially answering the question of where in the park this experience took place. Participants typically mention the location by writing the given name of a specific place or area in Discovery Park, including "North Beach," "parade ground area," "short grassy lawn," "tall grassy meadow," "Lighthouse," "Daybreak Star," "Loop Trail," and so on. Typically you should only code the participant's direct language without changing any words, though you can modify their response if the participant has misspelled or clearly misnamed a location. Coding for Location can provide useful information to identify areas within Discovery Park that afford especially meaningful opportunities for human-nature interaction.

As detailed below, Location is coded as either "Linked" or "Not-Linked." Linked Location directly describes an already-coded IP, whereas Not-Linked Location directly describes already coded Nature Actions, Nature Descriptions, and/or Psychological Descriptions. Sometimes the participant has identified a location, but do not code for Location if description is too vague to be identified on a map, if in their description you cannot be certain that the participant was actually at the identified spot during their described experience, or if the identified location has *no* connection to coded Nature Actions, Nature Descriptions, and/or Psychological Descriptions. Refer to the rules outlined below to guide your coding decisions for Location.

Decision Rules:

Rule 1:

Do not code Location if it is too vague to identify on a map. Locations that are automatically coded include: 1) Lighthouse, 2) Daybreak Star Cultural Center, 3) Environmental Learning Center/Visitor's Center, 4) Beach (include any specifications, such as "North Beach"), 5) Tall Grass Meadow, 6) Short Grassy Lawn/Parade Ground, 7) Trail Names ("Forest Trail," "Loop Trail," "Wolf Tree Nature Trail," "North Beach Trail," "South Beach Trail," "Hidden Valley Trail," etc.), 8) Fort Lawton Historic Buildings, 9) radar tower (colloquially known as the "giant golf ball"), 10) North Parking Lot, 11) East Parking Lot, 12) South Parking lot.

a. Example: "My family walked in the **woods**, then took a nap on a blanket in the shade of some trees **close to the water**. I loved watching my baby play in the dirt, and I loved seeing the dappled sunlight dance across her face during the nap. Then we stood at a **lookout point** and quietly looked at the water. We felt the breeze on our faces and heard the ocean sounds. My toddler ran free." → **no coded response for Location.**

    i. Notice how none of the bolded indicators of location are coded as Location, given that they are too vague to be useful for identification on a map.

b. Example: "I often park at the **North lot** to start my walk on the trail. Today I walked along the **nature trail** to the **Daybreak star** area, then **North beach trail** to **lighthouse**, **South bluff trail** up to the **giant golf ball**, down to the **loop trail** near the **visitor center** and back to the **North parking lot**." → coded as *Nature Trail, Daybreak Star, North Beach Trail, Lighthouse, South Bluff Trail, radar tower, Loop Trail, Visitor's Center, North Parking Lot.*

i. Notice how “giant golf ball” is coded as *radar tower* in order to keep consistency across the coding of the same location.

Rule 2:

Generally, code Location using the participant’s own words and omit any unnecessary adjectives and descriptive words that have nothing to do with identifying the location. If the participant has obviously misspelled or misnamed a location, you can modify their language to code the correctly identified Location.

a. Example: “I have had many experiences at Discovery Park. One of my favorite moments was sitting with my young daughter for a snack break by the **pond below the Daybreak Center**. We sat there, watching the ducks, observing the insects, and then my daughter played a bit around edges. Before heading onward we had the good fortune to hear owls caterwauling in the surrounding forest.” → coded as *pond below Daybreak Star.*

    i. Notice how “pond below” is included in the coded Location because it is specific enough to identify on a map, as per the previous rule. Additionally, notice how “Daybreak Center” was changed slightly to ***Daybreak Star*** to accurately reflect that location’s name.

b. Example: “Walk my dog in the **parade ground** area. Most important reason is the wide expansive view. On most days, I see and/or meet less than 10 people -- making it a very solemn place to clear my head.” → coded as *parade ground.*

Rule 3:

Sometimes participants mention specific locations in their Nature Language, but the identified locations are not necessarily the exact places where their experiences or

observations took place. In these cases, **do not code** any responses in which the participant was not actually present at that area during their experience described in their Nature Language.

a. Example: "There is one experience that comes to mind. It was a dark, chilly, windy day. I was one of very few people on the beach at the time. As I walked towards the **Lighthouse** spotted a small mound a few feet from the water. There was also a man with what looked like a camera used by a professional, taking pictures, taking pictures. As he saw me approach he waved me off. Of course, the mound turned out to be a baby seal, most likely resting and warming its body. At one point, an adult seal, most likely its mother, glided past in the water." → **no coded response for Location.**

    i. Notice how "Lighthouse" is not coded, because the participant did not specifically say they were at the Lighthouse when this experience happened. Though they said they were walking "towards the Lighthouse," this is not enough information to infer how close they actually were to the Lighthouse, therefore this response is not coded.

b. Example: "I had intended to walk down to the **North Beach** to watch the sunset, but we ended up staying at the **parade ground** to sit on the grass and have a picnic." → coded as *parade ground*.

    i. Notice how "North Beach" is **not coded** as Location, because the participant did not actually go to this location. Rather, the participant

specified that they sat on the grass at the "parade ground," thus why this is the only coded Location.

Rule 4:

Do not code Location that has no relationship to either a coded IP or coded Nature Action, Nature Description, or Psychological Description. In other words, Location must be coded as either Linked (directly describing an IP) or Not-Linked (directly describing a Nature Action, Nature Description, or Psychological Description), as outlined in the "Linked versus Not-Linked" section.

a. Example: "The park is one of my favorite places of all time for many years and I usually spend hours there if I can. The **lighthouse** and surroundings are my favorite area, though I also spend much time round **the trees above the bluffs** down below the **parade ground** and **many trails and woods**. The old **Fort Lawton buildings** are just beautiful and I love the fact that they remain as they are." → **no coded response for Location**.

    i. Notice how, although the participant mentioned many locations, there are **no coded** Locations in this example. This is because there are no coded IPs, Nature Actions, Nature Descriptions, or Psychological Descriptions to establish a linkage, thus these locations do not provide useful information for our study.

Linked versus Not-Linked Location:

The decision to either "link" or "not-link" Location depends on whether it is directly connected to a coded Interaction Pattern or to a coded Nature Action, Nature Description, and/or Psychological Description, respectively. In the former case, you would

establish a linkage in the database between Location and the coded IP. In the latter case, you would code Location as Not-Linked, even though Not-Linked for this level of coding requires and implies a linkage to a Nature Action, Nature Description, and/or Psychological Description. If the participant has written an indicator of location, yet it is not additive information to either a coded IP, Nature Action, Nature Description, and/or Psychological Description, then do not code it as Location. "Location" that is not linked to any of the four previously listed coding levels is not useful information for our study and can bias our data if included.

Example #1:

Nature Language: "I ride my bicycle to the park often, and love to sit on a driftwood log and watch the sanderlings play keep-away with the waves. One morning I saw a bald eagle snatch a fish out of the waves **just off the lighthouse point**."

Linked versus Not-Linked Location: Coding Example #1:		
Interaction Patterns	Linked Location	Not-Linked Location
1. sitting on log		
2. watching sanderlings		
3. seeing bald eagle	just off lighthouse point	

→ Notice how "just off the lighthouse point" is a direct continuation of the IP *seeing bald eagle*, thus why the two are linked.

Example #2:

Nature Language: "We spent most of our time sitting on the beach at the **Lighthouse**. When we had walked back to meet the rest of our group at the **parade ground**, we felt so

relaxed and grateful for having such a wonderfully expansive and diverse natural environment that's accessible to us in a city."

Linked versus Not-Linked Location: Coding Example #2:		
Interaction Pattern	Linked Location	Not-Linked Location
1. sitting on beach	Lighthouse	parade ground

→ Notice how "Lighthouse" is Linked to the IP *sitting on beach* because the participant clearly stated that they were sitting on the beach at the Lighthouse, thus linking the two.

→ Notice how "parade ground" is coded as Not-Linked, because although it is not describing the experience of sitting on the beach, it is still linked to Psychological Descriptions ("feeling so relaxed and grateful…") and Nature Descriptions ("expansive and diverse…").

H. Themes

General Rule:

Themes are our attempts to categorize repeating ideas throughout our data. Code all themes by taking the *direct* text relevant to the theme from the participant's Nature Language, and entering that text in the designated box in the database. Inter-coder reliability will only be verified through confirming that both coders noted the presence of the same theme within the same data, not through a match of the exact text for each theme. In other words, it is more important to make sure you are consistently coding at least the presence of each theme within the data rather than worrying about what part of the text to include within your code.

Note: The following themes are classified by their definitions, along with brief descriptions of their relevance and importance to our research, in addition to examples categorized as "Prototypical," "Boundary-Yes," and "Boundary-No" cases. A "Prototypical" example provides the canonical and clear case for which you would decide to code for that given theme. A "Boundary-Yes" example provides a case where the decision to code or not to code for the given theme is not as clear as that of the Prototypical, yet upon closer examination you should ultimately decide to code for that theme. In contrast to the Boundary-Yes examples, a "Boundary-No" example provides a case in which the decision to code or not code for the given theme is not clear, yet upon closer examination you should ultimately decide **not** to code for that theme. The text that is **bolded** indicates the portion of the Nature Language that should be coded for the given theme.

1. Absence of Civilization:

The participant discusses the sense of Discovery Park being a place that is distanced from human civilization, usually with a mention of feeling immersed within wild forms of nature (typically referred to as "wilderness"). This theme captures the essence of what could be lost as urban development continues to rise. Research shows a correlation between declining mental/physical health and living in a city, thus reinforcing the importance of having accessible places like Discovery Park that afford the beneficial experience of the *absence* of city life.

Prototypical Examples:

a. "This is a wonderful place to connect with nature -walking along the trail out to the high cliffs with sky and water all around, **finding a richer, quieter sense of place in view of but removed from the urban experience of Seattle**."

   → This response *is coded* because the participant clearly implies a feeling of the absence of civilization through their mention of being "removed from the urban experience."

b. "We've more recently discovered the beautiful section of old growth (I think) forest that links the road east of the park with the parking lot. **The trails that wind up and down through the trees transport you to a place far away from the city**."

   → This response *is coded* because the participant clearly states that this area within Discovery Park "transports" them to a place that is "far away from the city," thus implying an absence of city life/civilization.

c. “On foggy days, **I loved the feeling of coziness and insularity of being in the middle of the tall grass fields and not being able to see civilization**, despite being right in the thick of it.”

→ This response *is coded* because the participant explicitly mentions the apparent lack of civilization while still being in a city.

Boundary-Yes Examples:

a. “Sometimes I will sit by this small pond for a while and wait for the duck family to come home for the night. I love to watch them land on the water and swim around a bit before settling in for the evening. **This particular pond is quite small and surrounded by tall grasses and shrubs and rarely visited by other people so I can sit and relax and imagine I’m in the wilderness.**”

→ This response *is coded* because the participant does provide adequate mention a feeling of the absence of civilization, implied in their mention of “wilderness.”

b. “Went hiking on a rainy day with my husband. The park is beautiful and nicely maintained. **It was nice to get away in the woods.** we also stopped by the visitors center and the staff was helpful and courteous. We love this park!”

→ This response *is coded* because the participant implies an escape from civilization through their phrasing, “It was nice to get away,” in addition to their implication of being immersed in wild nature through getting away “in the woods.”

c. "**When is this park a person can get an 'out of city feeling.'** More kinds of birds than my yard, or corner park. Way better views than my roof. Few disturbing festivals or sports."

→ This response *is coded* because the participant states that Discovery Park affords them an "out of city feeling," which parallels the idea of feeling an absence of civilization.

Boundary-No Examples:

a. "There's nowhere else I know that is so perfectly forlorn and with such perfect natural desolation (in a city) and every time I feel so much better for having been there. I have several friends as well who have been going there almost daily for over 40 years. Many, many thanks."

→ This response is *not coded*. Though the participant mentions some unique features of Discovery Park—a "perfectly forlorn" place with "such perfect natural desolation"—in addition to the contrast of the park being "in a city," this is not enough information to infer that the participant specifically felt an *absence* of city life.

b. "The views are amazing out into the sound which makes me appreciate what a beautiful place we all call our "home." Frankly, I don't really think of the Discovery Park experience from the standpoint of communing with nature. Too many reminders of the city close by to make me feel like I'm truly out in nature."

→ This response is *not coded*. The participant actually discusses the *opposite* of this theme, and writes about how they still feel the presence of civilization when they are in Discovery Park.

2. Seclusion:

The participant explicitly discusses that they were afforded the experience of being alone, or away from other people, while in Discovery Park, including a focus on solitude, peace, quiet, and tranquility. Similar to the theme *Absence of Civilization*, *Seclusion* captures the essence of another important feature that will be lost as urban development continues to rise. It is difficult to find moments of aloneness and tranquility within a city, which is why it is important to maintain the public's access to places like Discovery Park that afford the opportunity to find peace through solitude.

Prototypical Examples:

a. "I took a long walk by myself just to visit the park because I had never been. I enjoyed a long peaceful beach walk and a nice short hike. It was a great small part of nature in a large city and **it made me feel completely secluded**."

→ This response *is coded* because the participant explicitly mentioned feeling "completely secluded." Notice how their words, "I took a long walk by myself," are not relevant or coded because they do not provide adequate information to code the theme of Seclusion.

b. “My wife and I walk the loop trail every other day (rain or shine). It’s a wonderful outdoor experience, **lots of solitude** and seeing the seasons change.”

→ This response *is coded* because the participant explicitly mentioned that there is “lots of solitude” in Discovery Park.

Boundary-Yes Examples:

a. “I often walk the loop trail, sometimes extending my walk to include the beach. **I prefer to walk alone, as I enjoy the solitude, something so hard to find in the city.** When walking alone in the park, I can imagine I am miles away from Seattle. The air seems fresher, and the sounds of wind rustling leaves or causing branches to “moan” as they rub together help to remind me of my smallness in relation to the world.”

→ This response *is coded* because the participant mentions their enjoyment of the solitude afforded by Discovery Park, that is difficult to find within the city.

b. “Ran 15 miles. I run a 5 mile loop every week which encompasses part of the loop trail and stairs down the beach. Discovery Park is like a second home to me and allows me to escape city life and taps into my inner “hunter gatherer” as **I love** the diversity of terrain and **the tranquility at times**.”

→ This response *is coded*, only for the portion, “I love the tranquility at times.” This is enough to infer that the participant felt secluded in Discovery Park, as “tranquility” is a feeling that often goes along with solitude.

c. “Go there after work if time allows and hike a loop from the north parking lot down to the beach, lighthouse and back up the road or valley trail. Enjoy the views and forest. Sometimes see seals, sea otters, eagles, beaver in pond on north beach trail and other birds. Marvel at how much moss is hanging from trees right now and how damp everything is. **I like it there when it is raining because the very few people are in the park**.”

→ This response *is coded*. Though the participant did not explicitly mention that they were alone, they expressed their enjoyment of the park when there are “very few people,” thus providing enough information to infer the feeling of seclusion.

Boundary-No Examples:

a. “My friend and I went on adventure to get some good energy and clear space to calm the mind and heal our anxiety that we usually get from too many people.”

→ This response is *not coded*. Though the participant described their positive feelings in contrast to the anxiety they feel from “too many people,” this is not enough information to infer that they were actually alone and secluded within Discovery Park.

b. “I was walking by myself through the trails down to the beach. I loved breathing the fresh air, and didn’t mind the occasional rain falling from above.”

→ This response is *not coded*. Though the participant mentioned that they were by themselves, they did not discuss the special feeling of seclusion or solitude associated with being alone.

3. Generating New Social Relationships

The participant discusses how their experience in the park afforded the opportunity to positively relate to or communicate with strangers in the park. Despite the fact that cities are places of high population density, people often feel disconnected from those around them and lack a sense of community. On the other hand, nature often affords a sense of comfort that can open people up to connecting with new people in ways that would not happen in a city. Thus, this theme captures the essence of nature's ability to encourage people to generate new social relationships with people they had never met before.

Prototypical Examples:

a. "**We crossed paths with a few people and made sure to say hello. With kind smiles to offer, we learn mannerisms of nature. We are not much for hellos downtown compared to the trails.** We very quickly learn the mannerisms when immersed in nature. As simple as offering kind smiles and salutations, it seems we can give as much as nature does."

   → This response *is coded* because the participant explicitly mentioned their effort to "say hello" to other people in the park that they did not already know, which often does not happen in the city.

b. "**I am a birder and, last Sunday, seeing a young man and woman who clearly were not from around here, was able to loan them my binoculars and point out the one place Mt. St. Helens can be seen from the park**

(North Bluff on a perfectly clear day). They were thrilled, and their happiness made my day! I visit the park about once/month in fall & winter, and thoroughly enjoy the 2.8 mile Loop Trail walk. I see interesting birds but the walk and peace & quiet are the real reasons I go there. **I like to answer people's questions about the geography, wildlife and plants**."

→ This response *is coded* because the participant explicitly mentions how the results of their social interaction with new people in the park made their day.

c. "Out on the water we enjoyed watching large numbers of Western Grebes, Horned Grebes, a few Red-necked Grebes and one Common Loon. We also found a few Common Goldeneyes and lots of Mew Gulls. **We had a spotting scope and were able to show others some of these birds. It is always fun to show the birds to people who do not have binoculars or spotting scopes.** When they can see birds close up they have an appreciation for how amazing the birds really are."

→ This response *is coded* because the participant explicitly discusses how fun it is to share their experience of birdwatching with others in the park.

<u>Boundary-Yes Examples</u>:

a. "Coming here, I love to sit and listen to the birds, as I know so many do. **I may be able to chat with someone who is doing the same thing as me**, or sit peacefully and intently."

→ This response *is coded* because of the direct mention of striking up conversation with others in the park.

b. "When we can't go hiking, we come to discovery park for a few hours of being outside, seeing trees, and seeing water. It's way nicer to come here instead of just walking around my neighborhood because there is much more light. The greyness doesn't feel oppressive, it actually makes some of the greens and yellows in the park pop and stand out. We always bring our dog too, so it's a nice way for all of us (my spouse and dog and I) to spend some time together while getting some exercise and being someplace beautiful. We always feel better after a visit to the park. Additionally, **everyone we run into tends to be quite nice/ courteous**."

→ This response *is coded* because the participant discusses the ease of their ability to talk with others in the park who are "nice" and "courteous."

<u>Boundary-No Examples</u>:

a. "My wife and I went to the park to people watch. We sat at the parade ground for a few hours as we watched other people run around excitedly with their dogs or simply enjoying a nice picnic in the sun. Whatever people were doing, they all looked like they were having a great time!"

→ This response is *not coded*. Though the participant discusses how they were watching other people, they did not explicitly mention that they actually talked to or connected with others in any meaningful way.

b. “I went to Discovery Park with my two young kids. We were trying to figure out the best way to get to get to the beach, so we stopped in the Visitor’s Center to ask the person working there for a map. After we got everything we needed, we started our journey down to the beach!”

→ This response is *not coded*. Though the participant discusses how they talked with someone at the Visitor’s Center, this is not information to classify as actually having “generated a new social relationship” because the participant had simply asked a question to an employee of the park.

4. Deepening Existing Social Bonds

The participant discusses how their experience in the park afforded the opportunity to deepen their already-existing relationships with family, friends, peers, acquaintances, etc., through their joint visit of the park. To qualify for this theme, the participant must somehow emphasize the *deepening* of such relationships. As such, do not code responses that simply mention that the participant had come to the park with other people.

Prototypical Examples:

a. “**Going here with people has allowed me to connect and talk with them about conversation that simply does not happen in everyday life. I guess I feel closer to myself and those around me when I leave Discovery Park**, and that is why it is so special to me.”

→ This response *is coded* because of the direct mention of deepening relationships with people they came to the park with.

b. “I love coming to Discovery Park. I think the most meaningful experiences I’ve had in Discovery have been with my son. We’ve lived in Magnolia since he was in middle school, and as he was growing up (he’s already off in college now) we’d always go to the park at least once a week to decompress with each other. **Our conversations were different when we were in the park compared to at home. I think being outside in nature helped us both feel comfortable enough to open up, and so we really got to know each other through these weekly walks together**.”

→ This response *is coded* because the participant explicitly mentions how being in Discovery Park allowed for a closer relationship with their son.

<u>Boundary-Yes Examples</u>:

a. “When we can’t go hiking, we come to discovery park for a few hours of being outside, seeing trees, and seeing water. It’s way nicer to come here instead of just walking around my neighborhood because there is much more light. The greyness doesn’t feel oppressive, it actually makes some of the greens and yellows in the park pop and stand out. **We always bring our dog too, so it’s a nice way for all of us (my spouse and dog and I) to spend some time together while getting some exercise and being someplace beautiful**.”

→ This response *is coded*. Though the participant did not explicitly mention *deepening* their relationship with their spouse and dog, they implied it through writing about how being in Discovery Park is a

"nice way" for all of them to "spend some time together." This response is definitely a boundary case, though it is coded because of the implied intention to go to the park to spend quality time with each other. This example is different than a case where a participant might simply write that they went to the park with their spouse for a walk, which does not adequately imply an intention of deepening their relationship.

Boundary-No Examples:

a. "I took a hike with my family this weekend down to the beach at Discovery Park."

   → This response is *not coded* because it does not mention the *deepening* of their relationships, and only that they went to the park together.

b. "A walk in Discovery Park with my husband. We do this for exercise and to enjoy the beauty of our surroundings."

   → This response is *not coded*, as there is no mention of the participant *deepening* their relationship with their husband.

c. "My family walked in the woods, then took a nap on a blanket in the shade of some trees close to the water. I loved watching my baby play in the dirt, and I loved seeing the dappled sunlight dance across her face during the nap. Then we stood at a lookout point and quietly looked at the water. We felt the breeze on our faces and heard the ocean sounds. My toddler ran free."

→ This response is *not coded*, as there is no mention of the participant *deepening* their relationship with their daughter, despite the fact that the participant "loved" watching her in the park.

5. Nature Sparking Memories/Happy Rumination

The participant discusses a positive or happy memory that they either: 1) associate with Discovery Park, or 2) thought about *because of* their experience in Discovery Park. "Rumination" often has a negative connotation and is more likely to happen in an urban environment as opposed to a natural environment. Research shows that interacting with nature can *decrease* rumination, yet this theme captures a similar idea of nature affording "*happy*" rumination—thinking about positive memories—instead of no rumination at all.

Prototypical Examples:

a. "I love sitting by the beach. **In many ways the salt water reminds me of places I have been in the past that feel like home**."

   → This response *is coded* because the participant directly describes how being in Discovery Park reminded them of places in their past that felt "like home."

b. "I will share with you that there is one place I visit that has special meaning to me – it's a high meadow that overlooks the bay. **This is quiet open place and when I'm here, I most often think of and remember my Mom who passed not long ago. This meadow was one of the stops on my first hike in the park after my Mom passed last November...I spent a long time here remembering her. And, while I was looking out on the water a long Cruise ship was pulling out on it's way to Alaska...I had just taken**

my Mom on our first cruise - to see Alaska - a few months before her death - and we had sailed on our ship together in this same pass. So now, this stop is always a time for me to check in with my Mom and my remembrances of her."

→ This response *is coded* because the participant clearly explains how this part of Discovery Park is a special reminder of and connection to their late mother.

Boundary-Yes Examples:

a. "I have come to Discovery Park ever since I was young and have been in awe of its natural beauty for 20 years. Every time I visit the park, I experience nature in a new and breathtaking way. I often walk along the beach and gaze at the gorgeous Olympic Mountains. I have seen orca whales, seals, fish, eagles, herons, shorebirds, and many other sea creatures in their natural habitat all from shore. I always take long, calming walks on the trails and I appreciate the vast amount of native vegetation. Several times I have seen owls, rabbits, foxes, and snakes. The meadow shines in sunset and the sunrise, which are my favorite times to go for a run and take advantage of the hilly terrain. **I remember when I was young my favorite place to go was the visitor center.** This park has sparked a passion in me for protecting the rest of the natural beauty Washington State has left. I cannot describe the beauty Discovery Park had brought into my life. I only hope to one day share these experiences with future children and show them the last place in Seattle where the land's natural beauty is preserved."

→ This response *is coded* because the participant writes about their memory of one of their favorite places being the Visitor's Center in Discovery Park.

b. "I grew up practically in the woods (parents had an acre and could only see one neighbors house). **Frequently walk Discovery for the exercise, to combat fatigue of being around buildings instead of trees, get some sunshine, and remember what it was like to play in the woods as a kid**."

→ This response *is coded* because the participant writes about the positive memory of playing in Discovery Park's woods when they were a kid.

<u>Boundary-No Examples</u>:

a. "I went to the park with some friends to watch the sunset. We ran through the different trails in the grassy fields. The sun was setting low and everything had a nice yellow haze to it. We looked out at different viewpoints and saw the water and Mount Rainier. The water stretched for miles and it was a deep blue. I felt like I was standing on the cliffs in San Francisco because it was still late summer and it wasn't cold or grey yet."

→ This response is *not coded*. Though the participant mentions how being in Discovery Park made them feel like they were "standing on the cliffs in San Francisco," they did not explicitly state that this was associated with a *memory*. From this response, we cannot tell whether the participant has actually been to San Francisco and was

connecting Discovery Park to that specific memory rather than a general feeling.

b. "A barefooted walk on the tide flats always grounds my aspirations in humility... looking up at the south bluff I just walked down puts me in touch with the unfathomable depths of our geological history, and from there it's an easier leap into the spiritual link humanity has with life's antiquity... the plethora of that richness."

→ This response is *not coded*. Though the participant writes about how they felt "in touch with the unfathomable depths of our geological history," this is not a reference to a specific memory that was sparked by being in Discovery Park.

6. Biodiversity/Diverse Landscapes

The participant either writes about: 1) the high level of biodiversity within a given ecosystem at Discovery Park, or 2) their *appreciation* of the diversity *across* landscapes at Discovery Park. One of the unique aspects of Discovery Park is its expansive size that allows for a wide range of habitats, thus making it a relatively high hotspot of biodiversity within Seattle. We are interested in coding all instances in which the participant makes note of these unique aspects of Discovery Park, including lists of plant/animal species they noticed, and/or an appreciation or enjoyment of the several distinct landscapes within the park. As urban development continues to rise, we are at risk of losing places like Discovery Park that are rich centers of biodiversity both within and across ecosystems/landscapes.

Prototypical Examples:

a. "**Unlike other parks in Seattle, Discovery park has the ocean, the forest, and all those who inhabit those areas with an incredible view of the Olympic Mountains. Coming into Discovery Park is like a walk into the woods, where ferns, trees, and birds dominate the landscape. Eventually, the trail leads to a meadow unlike anything I have seen in Western Washington. Continuing on leads to a path down to the beach, where sea life can be observed with the beauty of the mountains behind it**."

→ This response *is coded* because the participant mentions and describes Discovery Park's diverse landscapes in comparison to the *lack* of such diversity at other urban parks, implying an appreciation of Discovery Park's diversity.

b. "I used to run the 3-mile loop on a regular basis. **I enjoyed the views of the water overlooking the bluff, the woods, trees, once saw an owl, and the Dogwoods blooming in May.** As a child, I came with my parents for long walks in the woods."

→ This response *is coded* because the participant mentions their "enjoyment" of the various landscapes and species they saw in Discovery Park.

<u>Boundary-Yes Examples</u>:

a. "A group of friends and I had come to walk in the park on our day off. We descended the forest trail to the beach identifying plant and bird species along the way. While on the beach my friend who is originally from

Bainbridge Island showed us how to look closer to see the tiny crustaceans and anemones hiding under rocks. **Particularly meaningful for me was getting to see western waterfowl species that I don't get to see often in the east as well as the experience of seeing the marine life microcosm in contrast to the views of the Olympic mountain range macrocosm."**

→ This response *is coded* because the participant wrote about the meaningful experience of seeing the contrasting ecosystems of the marine life and mountain ranges.

b. "Walked the 5 mile loop; beautiful cold dry weather; **enjoyed the scent of the forest and beach, and the mountain and water vistas**; invigorating and refreshing."

→ This response *is coded* because the participant describes their enjoyment of the various landscapes across Discovery Park: "the forest and beach" and "the mountain and water vistas."

<u>Boundary-No Examples</u>:

a. "At Discovery, we can see bluffs, sand dunes, grasses, little forests, Puget Sound, animals, the sunshine, and even some local history. All within a couple of miles of where we live."

→ This response is *not coded*. Though the participant listed several landscapes/ecosystems, they did not imply an *appreciation* of such diversity, thus not qualifying for this theme.

b. "It's been a long time since we saw pheasants running through the meadow. We enjoy the birds hopping in the branches of trees and shrubs, and the

views of sparkling water below. We visit the park, usually on Sundays, throughout the year. Our journey always takes us over the crest of the meadow that overlooks the water and the old military buildings, past the flagpole and down along the path that traverses the northern edge, then behind the government buildings and down into the northwestern meadow, through the grass that again links up to the main part of the park where the sand pit rises. Then we traverse the cliff's edge, past children, dog-walkers, chatting couples sitting on the beat up wooden benches that look across the Sound. Then back through the meadow, east to the parking lot. We've more recently discovered the beautiful section of old growth (I think) forest that links the road east of the park with the parking lot. The trails that wind up and down through the trees transport you to a place far away from the city.

→ This response is *not coded*. Though the participant lists the various kinds of landscapes and ecosystems across Discovery Park, they did not mention an *appreciation* of the diversity, thus not qualifying for this theme.

I. Notes

This level of coding is a free response for the coder. Here you can make a note of anything you found particularly interesting or outline your connections to other ideas. “Notes” can be particularly helpful when writing a publication, as you can go back to this category to find any anecdotal data you would like to use for your own purpose.

References

Bratman, G. N., Hamilton, J. P, Hahn, K. S., Daily, G. C, Gross, J. J. (2015). Nature experience reduces rumination and subgenual prefrontal cortex activation. *PNAS, 112* (28) 8567-8572. doi:10.1073/pnas.1510459112

Bratman, G. N., Hamilton, J. P., & Daily, G. C. (2012). The impacts of nature experience on human cognitive function and mental health. *Annals of the New York Academy of Sciences, 1249*(1), 118-36.

Frumkin, H., Bratman, G. N., Breslow, S. J., Cochran, B., Kahn, P. H., Jr., Lawler, J. J., Levin, P. S., Tandon, P. S., Varanasi, U., Wolf, K. L., Wood, S. A. (2017). Nature contact and human health: A research agenda. *Environmental Health Perspectives, 125*(7), 075001-1. DOI:10.1289/EHP1663

Hartig, T., & Kahn, P. H., Jr. (2016). Living in cities, naturally. *Science, 352*, 938-940. doi: 10.1126/science.aaf3759

Kahn, P. H., Jr., & Hasbach, P. H. (2013). The rewilding of the human species. In P. H. Kahn, Jr. & P. H. Hasbach (Eds.), *The rediscovery of the wild* (pp. 207-232). Cambridge, MA: MIT Press.

Kahn, P. H., Jr., & Weiss, T. (2017). The importance of children interacting with big nature. *Children, Youth, and Environments, 27*(2), 7-24.

Kahn, P. H., Jr., Lev, E. M., Perrins, S. P., Weiss, T., Ehrlich, T., & Feinberg, D. S. (2018). Human-nature interaction patterns: Constituents of a Nature Language for environmental sustainability. *Journal of Biourbanism, 1&2, 17*, 41-57.

Kahn, P. H., Jr., Ruckert, J. H., & Hasbach, P. H. (2012). A nature language. In P. H. Kahn, Jr. & P. H. Hasbach (Eds.), *Ecopsychology: Science, totems, and the technological species* (pp. 55-77). Cambridge, MA: MIT Press.

Kahn, P. H., Jr., Ruckert, J. H., Severson, R. L., Reichert, A. L., & Fowler, E. (2010). A nature language: An agenda to catalog, save, and recover patterns of human-nature interaction. *Ecopsychology, 2*, 59-66.

Kahn, P. H., Jr., Weiss, T., & Harrington, K. (2018). Modeling child-nature interaction in a nature preschool: A proof of concept. *Frontiers in Psychology, 9*:835. doi.org/10.3389/fpsyg.2018.00835