

Evaluating a quality evaluation tool for use in designing healthcare gardens

- A case study of a landscape analysis method applied to two stress rehabilitation gardens

Fredrik Tigerschiöld



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Abstract

Stress-related mental illness is widespread in Sweden. Meanwhile, there is evidence that nature can help treat these illnesses. To implement nature as a tool for rehabilitation, some knowledge of landscape architecture is needed. Such knowledge exists, but may be challenging to implement. This thesis is a case study, applying Bengtsson & Grahn's (2014) quality evaluation tool for use in designing healthcare gardens to two cases. The aim of the study is primarily to evaluate the tool and secondarily to provide recommendations regarding the healthcare gardens. The evaluation resulted in several discussions around the tool and a practical matrix that may lower the threshold for applying the tool's landscape analysis. Thus, the wider aim of working toward better healthcare gardens is reached. In conclusion, the quality evaluation tool is a powerful and versatile addition to any landscape architect's repertoire. Applying the results from this case study may significantly simplify the use of this tool for the unfamiliar user.

Preface

Mental illness and the healing properties of nature has been at the core of my last few academic years. It is a personal interest and necessity to let my mind revolve around these topics. However, as interesting as theory in this field can be, a landscape architect must be able to create good environments for people. This thesis is a struggle between a theoretical interest and a practical ambition. Fortunately, I make progress in both areas.

I would like to thank my supervisors, Mats Gyllin and Anna Bengtsson, for providing me with confidence and guidance. This work was made possible by the generosity of Bibbi and Bodil at Lyngby Skola and Mikeal at Framnäs Gård. Thank you.

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Introduction

Stress related mental illness is widespread

In Sweden, stress related illness is one of the most common causes for long term sick leave (Åsberg et al., 2010). Traditionally, mental, musculoskeletal, cardiovascular and respiratory illnesses has been seen as stress related to some degree (Socialstyrelsen, 2003). This group of illnesses constitutes around 80 % of long term sick leave (Socialstyrelsen, 2003).

In a report on the development of sick leave in Sweden, Försäkringskassan (2017) state that mental diagnoses constituted 44 % of ongoing cases of illness, making it the largest category. Of the mental diagnoses, stress related mental illness is the largest subcategory, making up for around 50 % of the cases (Försäkringskassan, 2017). Between the years 2010 and 2015, stress related mental illness was the most prominently increasing category of mental diagnoses, rising from 31 000 new cases to 68 000 (Försäkringskassan, 2016). Constituting around one in five cases of ongoing illness cases in Sweden (Försäkringskassan, 2017, 2018b), stress related mental illness may be considered a widespread health issue.

Stress related mental illness is a growing issue, and adding to the problem is the relatively long duration of these illnesses. The median sickness duration in mental illness is 75 days, compared to 44 days for all diagnoses (Försäkringskassan, 2017).

Large numbers of workers on sick leave cost a considerable amount of money. During quarter 4 of 2017, the number of

ongoing cases of stress related mental illness reached 35 000, with 179 000 in total number of sickness cases (Försäkringskassan, 2018b). Both of these numbers represent cases with sickness cash benefits. In total, sickness and rehabilitation cash benefits reached 33 billion SEK in the year 2017 (Försäkringskassan, 2018a).

Taken together, these statistics may prove the importance of work aimed at helping people recover from, and avoid falling into, stress related mental illness.

Nature based rehabilitation

Counteracting this shift towards a stress-ridden society is one area where a landscape architect may be useful. In a landmark study, Roger Ulrich (1984) showed that people recuperate from surgery faster and need weaker painkillers if the view through their window is of trees instead of a brick wall. This shows that natural stimuli can affect human health positively.

Stress reduction is one of the most important mechanisms of health promoting natural environments (Health Council of the Netherlands, 2004; Ulrich, 1999; van den Berg, Joye, & de Vries, 2013). Other such mechanisms are improvements in air quality, stimulation of physical activity and facilitation of social cohesion (van den Berg et al., 2013).

Rationale

Focusing on stress reduction by way of nature-based rehabilitation (NBR) seems to be in line with a current need in society. Stress is linked to widespread mental illness in Sweden (Försäkringskassan, 2011, 2013, 2017; Grahn & Stigsdotter, 2003; Johansson, Kollberg, & Bergström,

2009; Pálsdóttir, 2014; Socialstyrelsen, 2008), has an impactful role in general health care (Ulrich, 1984, 1991, 1999) and potential health risks (Schneiderman, Ironson, & Siegel, 2005; Socialstyrelsen, 2016; Ulrich, 1993).

While this thesis focuses on benefiting individuals with stress related mental illness, all humans experience stress (Åsberg et al., 2010). Stress is an adaptive mechanism (e.g. Ursin & Eriksen, 2004) but may well cause suffering even under normal circumstances. Therefore, the development of stress reducing environments may be of value to people even in the absence of illness. Further, as shown by Ulrich (1984), stress reduction may be useful in health care settings where stress is not the primary cause of the illness, but an impediment to recovery. By providing environments that effectively reduce stress or tools that help designers in doing so, salutogenic health promotion, as described by Antonovsky (1996), may be achieved. If this is done on a nation-wide level, the long-term effects could be significant. The positive effects of having nature available in everyday situations have been shown to hold health promoting effects (Ottosson & Grahn, 2008). This line of thinking provides further motivation to pursue knowledge in this field.

Target group

While the aim of this study is to evaluate a landscape analysis tool, the rationale behind this evaluation is to help create better health promoting outdoor environments for persons with stress related mental illness. Thus, the end target group of this study consists primarily of participants at NBR facilities for persons with stress related mental illness.

Aim

The aim of this thesis is to evaluate and explore a tool for developing health promoting environments. Understanding the mechanisms of health promoting outdoor environments as well as exploring operative and design pathways to reach these mechanisms are major goals in this work.

Working with a user group of highly stressed individuals, this thesis maintains a stress reduction focus and explores what needs to be included in the environment to achieve this effectively.

Research question

How may the *quality evaluation tool* (QET; Bengtsson & Grahn, 2014) be used and developed in the context of nature-based rehabilitation gardens for people with stress related mental illness?

How may the studied objects be enhanced based on the results of these analyses?

Limitations

This thesis is limited to health promoting outdoor environments. Thus, purely recreational and/or indoor environments are beyond the scope of this thesis. The landscape analysis (QET) is limited to two facilities.

Further, this work is limited to the study of environmental qualities that may be used as a support in design. This thesis studies measurable or mappable environmental aspects, not the art aspect of design. This work is not intended to be a design study and is not directly applicable in design.

The data collection part of this work is limited to operative and physical design aspects of the facilities in question. After collecting, analyzing and discussing data, a few recommendations for enhancing landscape design elements is laid forth. In providing recommendations, landscape design is prioritized over operative aspects of the facility.

The discussions in this thesis are focused on the landscape analysis part of the QET method and its implications.

Method

Case study

The main method of this thesis is a case study with two cases. The case study was used to meet the main aim of this thesis: to evaluate a quality evaluation tool. Case study methodology has been used before to study different qualities of outdoor environments (Bengtsson, 2015). For a richer description of the connection between studies intersecting environment quality evaluation and case study methodology, see (Bengtsson, 2015).

In both cases, Bengtsson & Grahn's (2014) *quality evaluation tool* (QET) for use in healthcare settings was applied. Following the practical use of the evaluation tool, both the analyzed landscapes and the analysis tool were discussed. These discussions are the primary results of the case study, which aims to evaluate the QET.

The QET is divided into three distinct steps, consisting of

1. a landscape analysis
2. interviews
3. proposals based on findings (Bengtsson & Grahn, 2014).

The three steps are methodologically described below.

In this thesis, the focus is on step 1. Therefore, interviews (step 2) and proposal discussions (step 3) were significantly limited. The interviews were unstructured and did not follow the template suggested by (Bengtsson & Grahn, 2014). The main function of applying this light version of step 2 and 3 was to support the evaluation of step 1

As the extended aim of this thesis is to create better environments for people, some proposals for enhancing the case study gardens were included at the end of this thesis. While some of the areas or qualities analyzed in this work have been given design recommendations, carefully analyzing each area's weaknesses and providing accurate solutions is beyond the scope of this thesis. Therefore, step 3 of the quality evaluation tool was only partially completed.

The results from step 1 are presented on pages 30 and 43. Appendices II-V contain

the raw results from step 1. These results are discussed on page 64 and 66.

The results from step 2 are presented on pages 99-103. The interviews are discussed on page 58 in the 54 part of this thesis.

The results from step 3 were derived from the discussions on page 66 and compiled on page 78.

The landscape analysis was conducted both during winter time and during late spring to reduce seasonal bias. The winter visit was done in December over the course of two days at both locations. The spring visit was done in April over the course of one day at both locations. Interviews and observations were used together with the landscape analysis tool.

Spatial identification

The quality evaluation tool is meant to be applied in four zones of contact with the outdoors:

1. inside the building
2. transition zones
3. immediate surroundings
4. the wider neighborhood
(Bengtsson & Grahn, 2014).

However, since the focus of this thesis is on outdoor environments, no indoor experiences were evaluated. The four zones of contact with the outdoors were not applied in this thesis.

Instead, a spatial identification was conducted for both cases. Both cases hold many different areas, and to rationalize the evaluation of the different areas of the study objects, an identification of these different areas is required. This was dependent upon the experience of

spatiality in the environment. The identified areas were labeled on base maps (figure 3 and 5) and were used as a spatial reference system in the landscape analysis. In both cases, the staff confirmed the relevance and accuracy of this spatial division.

The QET requires the tool user to note whether a physical or social quality may be experienced within a given area. Therefore, the spatial identification was experience-based.

In simple terms, the spatial identification process could be described as a “feeling” of standing in a room. When this feeling was experienced, the borders of the room in question were marked on a map.

To mark walkability between areas, the marked borders (figure 7) were drawn in close proximity to one another, for example as with area VI and VII or XI and XII. When the walkability between areas was limited, the marked borders were drawn with significant distance from one another, such as with area V and I or V and IV. This applies to both Framnäs Gård and Lyngby Skola.

As mentioned previously, the experience within a given room is largely defined by the properties of that room. However, in some areas other areas may be visible or audible in other areas. In some cases, other rooms had a significant impact on the experience within a given room, such as when manmade sounds could be heard from another part of the garden. In such cases, this boundary-defying experience was included in the quality evaluation of any affected room.

Quality evaluation tool

The QET (Bengtsson & Grahn, 2014) is a three step design process tool, developed for a healthcare outdoor environment context. The QET involves 19 qualities that are to be implemented in a three-step process by a landscape architect:

1. landscape analysis: evaluating an outdoor environment in relation to the 19 qualities
2. evaluation of qualities' importance to potential users
3. proposed actions based on findings in step 1 and 2 (Bengtsson & Grahn, 2014).

The 19 qualities that are the basis for the QET are a compilation of previous studies discussing environmental qualities for healthcare design (Bengtsson & Grahn, 2014). The qualities were divided into *comfortable design* qualities and *inspiring design* qualities.

According to Bengtsson & Grahn (2014), the comfortable design qualities must be measured in the garden as a whole, in order to enable the usage of the entire garden for every user, regardless of physical or mental condition.

Further, the authors suggest that the inspiring design qualities are used in relation to a *gradient of challenge*, based on their respective level of challenge. The gradient of challenge represents a gradual increase in the situation's demand on attention (Bengtsson & Grahn, 2014). In their view, more demanding/challenging situations, such as social interactions and

cultural environments, are suited for individuals sensitive for understimulation. In parallel, serene environments or refuges are suited to individuals sensitive to overstimulation (Bengtsson & Grahn, 2014).¹

In the comfortable design category (section A), six qualities are included:

1. closeness and easy access
2. enclosure and entrance
3. safety and security
4. familiarity
5. orientation and way finding
6. different options in different kinds of weather (Bengtsson & Grahn, 2014).

In the inspiring design category (section B), thirteen qualities are included (listed in order, from high challenge to low challenge):

1. joyful and meaningful activities
2. contact with surrounding life
3. social opportunities
4. culture and connection to past times
5. symbolism/reflection
6. prospect
7. space
8. rich in species
9. sensual pleasures of nature
10. seasons changing in nature
11. serene
12. wild nature
13. refuge (Bengtsson & Grahn, 2014).

Completing step 1 of the QET involves measuring the prevalence of each of the

¹ Somewhat explanatory to these differing needs is the notion that brain function is equally impaired by either a significantly increased or a significantly decreased level of circulating glucocorticoids (Lupien et al., 2007).

19 qualities in each area of the site. Bengtsson & Grahn (2014) do not mention how these qualities are measured. For example, they could be measured on a binary scale (0-1) or otherwise (0-N). While the QET is a qualitative inventory tool not aiming to determine what scales should be used, this requires the tool user to decide how to measure each quality.

In a pilot study of the QET (Brisard et al., 2018), the authors observed a difficulty in making accurate assessments using a binary scale in the QET analysis. This was due to issues with differentiating between weak and strong quality occurrences. Therefore, the present study used a three-value scale to measure the qualities: not found (-), weak/ambiguous quality presence (W), or strong/unambiguous quality presence (S). The weak/ambiguous quality presence value (W) was used when there was a weak or questionable occurrence of a given quality.

Each quality included in the tool is defined in a description of the QET (Bengtsson & Grahn, 2014). Drawing from these definitions, each quality's physical characteristics were extracted (appendix I) to use as an aid when analyzing the gardens.

The foundational study (Bengtsson & Grahn, 2014) leaves substantial freedom to the landscape architect concerning the actual evaluation of the qualities:

“in [step 1], every environmental quality in the target environment is investigated by a landscape architect”
(Bengtsson & Grahn, 2014, p. 888)

Some additional examples of physical characteristics influencing the 19 main qualities were added to the list of descriptors (appendix I) where examples were lacking. For instance, the description of *symbolism/reflection* involves “nature’s power of transformation” (Bengtsson & Grahn, 2014, p. 886), but only exemplifies aggressive spring greenery. Therefore, summer, autumn and winter were added as further possible examples of nature’s power of transformation. Such additions were made in five instances (appendix I). The legitimacy of using this descriptor list may be questionable. However, it provided some transparency in retrospection and was a basis for documentation during the evaluation of the 19 main qualities.

As this extended list of qualities with their respective physical characteristics is comprehensive and not explicitly included in the original QET method description (Bengtsson & Grahn, 2014), not every row was valued in every area. Instead, these descriptors were used as an assistance when evaluating the main 19 qualities. Because of this, the number of assessments made in each area varies. However, at least the 19 qualities of the QET were assessed in every area. The additional assessments were used to motivate the QET results.

Below, step 2 and 3 of the QET are described briefly. Note that these two steps were not fully completed in this thesis. Instead, lighter versions of the interview

and proposal steps were used as a support for evaluating step 1.

In step 2 of the QET, interviews with staff, users and next of kin/visitors inform the landscape architect of each quality's respective

1. experienced availability
 2. estimated importance
 3. reasons behind importance
- (Bengtsson & Grahn, 2014).

The final and third step of the QET involves balancing step 1 and 2 for each design category (A and B) respectively (Bengtsson & Grahn, 2014). The authors do not mention how this balancing is to be executed. Presumably, this balancing depends on the landscape architect and their competence. Based on findings in step 1 and 2, the landscape architect estimates measures needed to enhance the environment.

Interviews

Unstructured personal interviews were held with the staff at Framnäs Gård and Lyngby Skola. Using personal interviews ensures a response, in contrast to questionnaire surveys, and is an appropriate method for examining attitudes, values, beliefs and motives (Louise Barriball & While, 1994). The interviews aim to gain wide knowledge about the staff's opinion and experience of the facilities. The primary goal of the interviews was to support the evaluation of step 1 in the QET and to increase the accuracy of the result analysis.

Observations

To complement findings from the QET step 1 (landscape analysis), interviews

and general observations were used. Noting objects with special character or function, particular experiences or other observations with potential value enabled a more detailed description of the project sites. At Framnäs Gård, no visits were made when rehabilitation participants were present. Therefore, no observations on participant activity were made for this project site.

At Lyngby Skola, a small group of participants were present during the visit. Because of time and data size limitations, no systematic efforts were made to observe their use of the garden.

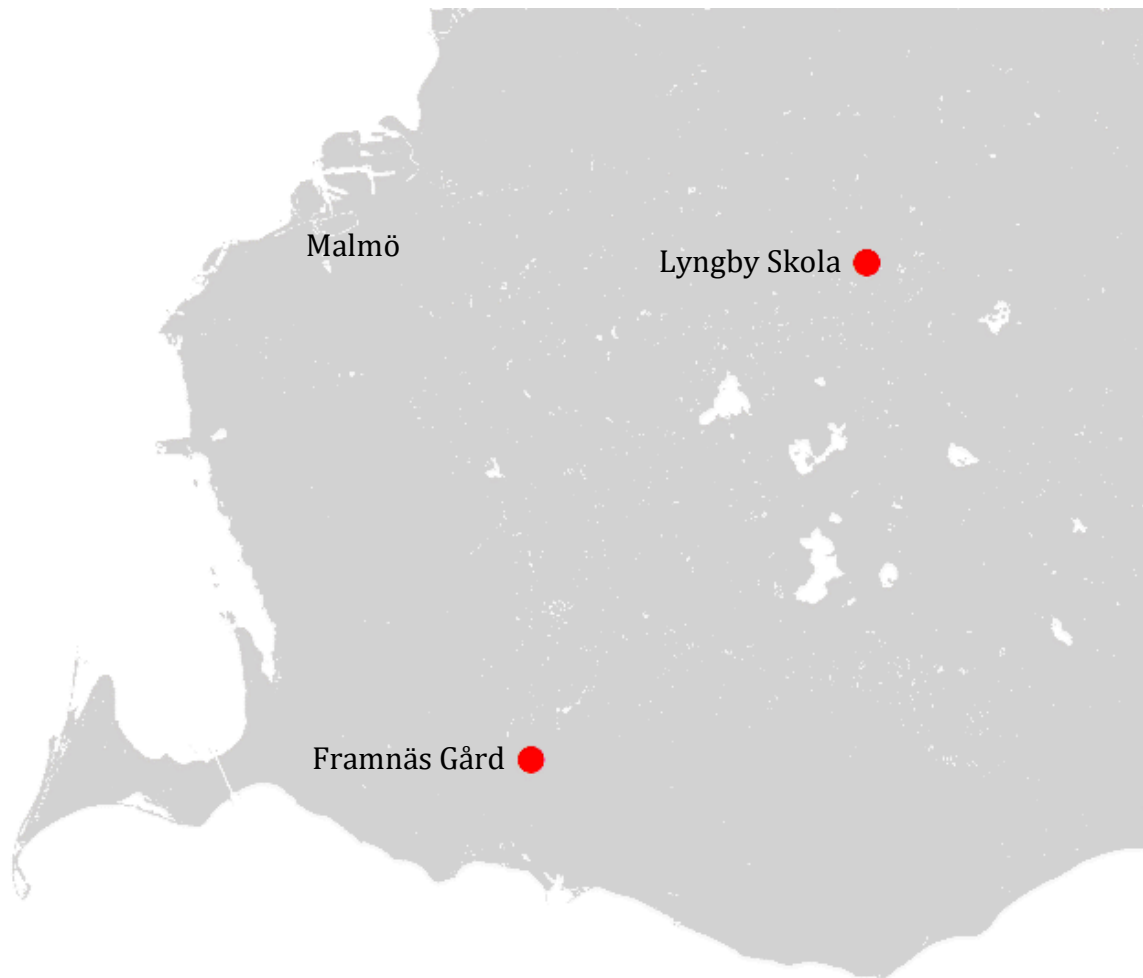


Figure 1: The two project site locations (red dots) in southwestern Scania. Illustration: Fredrik Tigerschiöld.
Map data: © Lantmäteriet.

Description of project sites

The project sites are two NBR facilities for individuals with stress related mental illness, Framnäs Gård and Lyngby Skola. These cases were selected from a list of such facilities operating under Region Skåne (Region Skåne, 2018). Facilities with geographical proximity to Alnarp were contacted (figure 1). The only positive responses were from Framnäs Gård and Lyngby Skola. Here, a minimal introduction to the two facilities is laid forth. Further descriptions are presented in the results part of this thesis.

Framnäs Gård

Framnäs Gård is located in Hammarlöv, five kilometers north of Trelleborg's central train station. The facility is surrounded by the flat farmland of Söderslätt and neighbors a historical village and a small pond (figure 2). Run by two individuals, operations at the facility consist of NBR, small scale farming and farmland recreation with various courses in farming, plant maintenance, animal

care, bakery, educational drama and relaxation.



Figure 2: Overview map of Framnäs Gård showing the property line and some of the surrounding farmland. Illustration: Fredrik Tigerschiöld. Map data: © Lantmäteriet.



Figure 3: Base map of Framnäs Gård. Illustration: Fredrik Tigerschiöld. Map data: © Lantmäteriet.

Lyngby Skola

Lyngby Skola is an NBR facility near the small village of Lyngby, 15 kilometers southeast of Lund's central train station. The surrounding farmland has low hills and scattered farms (figure 4). Lyngby Skola's staff consists of two individuals. Crafting activities such as knitting and brush making complement the facility's NBR.



Figure 4: Overview map of Lyngby Skola showing the property line and some of the surrounding farmland. Illustration: Fredrik Tigerschiöld. Map data: © Lantmäteriet.



Figure 5: Base map of Lyngby Skola. Illustration: Fredrik Tigerschiöld. Map data: © Lantmäteriet.

The structure of this thesis

This thesis consists of two main parts: a literature review and an empirical study.

The literature review aims to define essential concepts such as stress, stressor, stress related mental illness and nature's healing mechanisms.

The empirical study defines the method of this thesis and aims to apply the QET to two cases of rehabilitation gardens for persons with stress related mental illness. Through discussions, the case study is a basis for an evaluation of the QET as a method. Further discussions provide basic design recommendations for the studied gardens. These discussions are the results of the case study.

Definitions

In this thesis, the following terms are commonly referred to. Here, they are briefly defined.

Stress, according to Selye (1975) refers to the "nonspecific syndrome" caused by a stressor.

The *stressor* refers to the stressful event, "that which causes it [i.e. a stress response]" (Selye, 1975, p. 40). Stressors are also referred to as stress response determinants. The stress response determinants are defined on page 22, as they may be too complex to define here.

The *stress response* refers to the body's reaction to the stressor (Lupien, Maheu, Tu, Fiocco, & Schramek, 2007).

According to the current international classification of diseases (Socialstyrelsen, 2016), *stress related mental illness* is a

category of illnesses consisting of four types of diagnoses:

- acute stress disorder (F43.0)
- post-traumatic stress disorder (F43.1)
- adjustment disorder (F43.2)
- exhaustion syndrome (F43.8A).

The *Quality evaluation tool* (QET) refers to a tool for developing health promoting environments, as described in Bengtsson & Grahn (2014).

Literature review

This section aims to provide a literature overview for the phenomenon of stress. In both environmental psychology and stress research, there are different perceptions of the term's meaning (Dickerson & Kemeny, 2004; Kaplan, 1995, 2004; Ulrich et al., 1991). Unnecessary misunderstandings occur because authors may be vague when defining the concept. To avoid any such misunderstandings and to support this thesis's following discussions regarding environmental qualities for stress reduction, a nuanced overview on the phenomenon of stress is provided. Further, it seems pragmatic to be familiar with the source of the illness which is treated in this section of NBR: stress related mental illness.

Note that this literature review is heavily related to medicine – perhaps more so than to landscape architecture. Therefore, this section may be regarded as a prerequisite but clearly separate part to the rest of this thesis.

What is stress?

Selye (1936), often referred to as the founder of today's use of the term stress, showed that subjects react with a “general alarm reaction” and a “general adaptation syndrome” to non-specific physical harm. While these findings still apply in some sense, there are multiple aspects of the term stress that need elaboration. Below, heterogeneous descriptions of psychological stress are presented.

The job demand-control model

Karasek (1979) developed the job demand-control model (JDC model), describing the relationship between *job*

demands, *job control* and *job strain*. Using these three terms, the author avoids the term stress, which he briefly describes as an energized or motivated internal state of an individual. The three terms used instead of stress are described as:

- job demands, referring to stressors in the work environment
- job control, referring to a worker's ability to make their own decisions (also referred to as *decision latitude*)
- job strain, referring to conditions occurring when job demands are high and job control is low, relating to symptoms of *mental strain*.

Further, Karasek (1979) describes the symptoms of mental strain using two factors: exhaustion (tiredness and exhaustion), and depression (nervousness, anxiety, sleep issues, worry and depression).

Taken together, Karasek's job demand-control model (1979) describes how an individual may experience symptoms of mental strain if their work situation is highly demanding but lends little control to the individual.

While the JDC model is specific for the work environment, it seems reasonable to suggest that the stress response developed before any jobs did, indicating that the conditions required for a stress response may be found outside the work environment as well. Assuming that the model's reasoning might be applied outside of work environments, mental strain would be expected in any situation where an individual experiences inadequate control in a demanding environment.

The cognitive activation theory of stress

The cognitive activation theory of stress (CATS) was presented by Ursin & Eriksen (2004) as a means of understanding the psychological mechanisms causing the general alarm reaction. To discuss the wide phenomena of stress, the authors divide stress into four aspects: stress stimuli, stress experience, the general stress response, and experience of the stress response. In their view, the stress response is an adaptive response occurring when there is a conflict between what should be and what is.

To define what “a conflict between what should be and what is” refers to, Ursin & Eriksen (2004, p. 572) state that the stress response occurs in the following situations:

- when expectations are not met
- in response to novel stimuli
- where there is homeostatic imbalance
- when the organism is threatened.

Heterogeneity in the literature

The JDC model and the CATS are not the only explanation models of the term stress. Instead, there is “tremendous heterogeneity in the literature” (Dickerson & Kemeny, 2004, p. 355).

Counteracting confusion, Dickerson & Kemeny (2004) conducted a meta-analysis reviewing 208 laboratory studies of acute psychological stressors. The authors concluded that *uncontrollable* and/or *social-evaluative* situations significantly elevated cortisol levels. In an extensive literature review, Mason (1968)

found that situations characterized by *novelty* or *unpredictability* are capable of elevating levels of 17-OHCS.²

The definition of stress used in this thesis

General stress terminology

In order to be clear, some basic stress terminology needs definition. *Stress*, according to Selye (1975) refers to the “nonspecific syndrome” caused by a stressor. This is a highly general definition and, as it turns out, the word *stress* does not need to be any more specific. The specificity is within the terms *stressor* and *stress response*.

The *stressor* refers to the stressful event, “that which causes it [i.e. a stress response]” (Selye, 1975, p. 40), such as an earthquake or public speech (Lupien et al., 2007). The *stress response* refers to the body’s reaction to the stressor (Lupien et al., 2007).

What may constitute a stressor and a stress response will be defined below.

Specific stressors

In a literature review, Lupien et al. (2007) write that the stress response determinants are highly specific, contrary to Selye’s (1936) suggestion that stressors may be non-specific. Lupien et al. (2007) state that for a psychological stress response to occur in humans the individual has to interpret the situation

² 17-OHCS is a metabolite of cortisol (Lavin, 2009).

as containing one or more of the following characteristics:

- novel
- unpredictable
- uncontrollable
- containing the threat of social evaluation.

The relativity of stress

According to Lupien et al. (2007), stress can be *absolute* or *relative*.

Absolute stressors are adaptive in nature and are characterized by situations threatening the physical integrity of the organism (such as an earthquake, confronting a dangerous animal or being exposed to extreme temperatures) where a stress response is necessary for the organism's survival and/or well-being (Lupien et al., 2007). The absolute stressors are independent of the individual's interpretation of the situation (Lupien et al., 2007).

On the other hand, relative stressors depend on the individual's interpretation of the situation (as unpredictable, novel, uncontrollable or social-evaluative); not

every individual confronting a relative stressor is expected to experience a stress response (Lupien et al., 2007).

A theoretical integration and synthesis of laboratory research

By including the four determinants listed above, Lupien et al. (2007) are able to synthesize the literature review work of Mason (1968) and Dickerson & Kemeny (2004). It seems interesting to view the JDC model and the CATS in light of the stress perspective suggested by Lupien et al. (2007), since it is built upon extensive reviews of laboratory research. Below, an attempt to synthesize the different views is presented (table 1).

The stress response as described by the JDC model, the CATS and the perspective of Lupien et al. (2007) may be seen as dependent upon the individual's interpretation of their environment. Therefore, the different models are not directly incompatible with each other.

The stress inducing situation in the JDC model's view might be summarized as a highly demanding environment lending little control to the individual (Karasek,

Table 1: Stress study comparison

Study	Stress response determinants				
	Relative				Absolute
Lupien et al. (2007)	UP	N	UC	SE	RT
Relativity					
Determinants					
Dickerson & Kemeny (2004)	—	—	UC	SE	—
Karasek (1979)	—	—	JC,* JD	JD	—
Mason (1968)	UP	N	—	—	—
Ursin & Eriksen (2004)	UE	NS	—	—	HI, TO

Note. Dashes indicate not assessed or not available. The factors used were interpreted against factors suggested by Lupien et al. (2007) using reasoning provided below the heading 21. UP = unpredictable; N = novel; UC = uncontrollable; SE = social-evaluative; RT = real threat; JC* lack of job control; JD = job demands; UE = unmet expectations; NS = novel stimuli; HI = homeostatic imbalance; TO = threats to the organism.

1979). The lack of control element in this type of situation is analogous to the determining factor *uncontrollable*, presented by Lupien et al. (2007). Further, the demands imposed in a work situation such as those discussed by Karasek (1979) may be experienced as a *threat of social evaluation*. This assumption depends on the premise that the worker would be socially evaluated if the demands were not met. Also, the job demands constitute a motivated goal which is threatened by an uncontrollable situation, which was found to be a reliable stressor by Dickerson & Kemeny (2004). Therefore, the JDC model's determining factors may be viewed as nuances of the determining factors *uncontrollable* and *social-evaluative*, as presented by Lupien et al. (2007).

In Ursin & Eriksen's (2004) CATS, the determining factors for a stress response are, as mentioned:

- unmet expectations
- novel stimuli
- homeostatic imbalance
- threats to the organism.

The factor *unmet expectations* is, perhaps obviously, analogous to the determining factor *unpredictable*, as presented by Lupien et al. (2007). In a similar fashion, *novel stimuli* is analogous to the determining factor *novelty*, as presented by Lupien et al. (2007). *Homeostatic imbalance* and *threats to the organism* may be seen as real threats to the physical integrity of the organism, a category of stressors which is labeled *absolute* stressors by Lupien et al. (2007).

This procedure may demonstrate how two theoretical stress models, the CATS and the JDC model, are compatible with the findings of Mason (1968) and

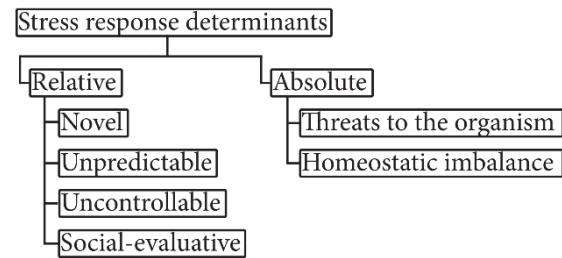


Figure 6: Stress response determinants (Lupien et al., 2007; Ursin & Eriksen, 2004). Each relative determinant is dependent upon the individual's interpretation of a situation. Illustration: Fredrik Tigerschiöld

Dickerson & Kemeny (2004) by using the broad view provided by Lupien et al., (2007). With this synthesis, the "tremendous heterogeneity" mentioned earlier does not seem as confusing. Therefore, the stress perspective provided by Lupien et al. (2007) will be used hereafter.

The stress model in short

To provide some oversight, an illustration summarizing conclusions drawn from the discussion above may be useful (figure 6).

An elaboration on relative stressors

Novel

According to Mason (1968, p. 580), novel situations may induce responses in the pituitary-adrenal cortical system of "unusual intensity." These are first experience, unfamiliar situations that have been observed to elicit considerable elevations in cortisol metabolite levels (Mason, 1968). Corticosteroid elevations as a response to novel situations are common in first day admission to hospital or laboratory settings (Mason, 1968). Therefore, Mason (1968) recommends psychoendocrine experimenters to allow

subjects to acclimatize to novel environments for at least three to seven days. The need to “settle into the new environment” has been observed in individuals with stress-related mental illness in an NBR setting (Pálsdóttir, Persson, Persson, & Grahn, 2014, p. 7100), reinforcing the significance of the novelty factor in this context.

Unpredictable

To Ursin & Eriksen (2004, p. 572), the determinant *unpredictable* seems central: “the alarm [i.e. stress response] occurs in all situations where expectancies are not met.” The authors define expectancy as the learned information that a stimulus predicts the occurrence of a following event, making unmet expectancies practically synonymous with unpredictability in a stress response determinant context.

Since one often cannot predict what will happen in an unfamiliar situation, the determinant *unpredictable* may seem synonymous to the determinant *novel*. Despite similarities, several studies include both novelty and unpredictable as separate determining factors for the stress response (Lupien et al., 2007; Mason, 1968; Ursin & Eriksen, 2004). They are not precisely the same, considering, for example, how the behavior of a familiar individual may be largely unpredictable at times. To further differentiate the two determinants, it seems entirely possible to be incapable to predict two familiar outcomes (when flipping a coin, as a simple example).

Lacking in the sense of control

The uncontrollable aspect refers to a desired outcome being independent of the

individual’s behavior in a given situation (Dickerson & Kemeny, 2004). Uncontrollable situations induce cortisol responses on average three times larger than controllable situations (Dickerson & Kemeny, 2004). However, in order to cause this effect, the lack of control must threaten a motivated goal and is not stressful on its own (Dickerson & Kemeny, 2004).

For example, being exposed to noise in the absence of a motivated task did not cause a significant cortisol response in the studies reviewed by Dickerson & Kemeny (2004). Nonetheless, it is possible to imagine a situation where noise threatens a goal, such as when noise may interrupt task solving thought, and, thus, may cause a cortisol response.

Containing the threat of social evaluation

Dickerson & Kemeny (2004) found that situations containing the threat of social evaluation elicit stress response effect sizes three times larger than situations without a component of social evaluation. This demonstrates the relative importance of this particular determining factor for the stress response.

The threat of social evaluation refers to a perceived threat to the goal of maintaining the social self (Dickerson & Kemeny, 2004). Interpreting a situation as containing this threat is most likely in situations where poor performance poses a risk of revealing a lack of valued traits, such as intelligence or competence (Dickerson & Kemeny, 2004). In studies of the stress response, it is common to introduce subjects to performance tasks with an element of social evaluation, such as a public speaking task with elements of verbal interaction or cognitive tasks (Dickerson & Kemeny, 2004).

Considering how work and/or education situations may often contain performance tasks with a social-evaluative element, the correlation between mental diagnoses and the psycho-social work environment (Försäkringskassan, 2016) is perhaps unsurprising.

Uncontrollable social evaluation - a potent combination

Among these determining factors, uncontrollable, social-evaluative situations induce the strongest cortisol activation response of them all, with an effect size ~37 % larger than that of the threat of social evaluation alone (Dickerson & Kemeny, 2004). Further, the stress response elicited from this combination requires a longer recovery process, with cortisol changes lingering at least 40 minutes longer than those induced by other situations (Dickerson & Kemeny, 2004). Considering this, uncontrollable, social-evaluative situations may be viewed as a high priority threat to stress recovery.

Stress hormone secretion

According to Selye (1975), the release of stress hormones is a fundamental element of stress. Chiefly, the hormonal response to stress involves the secretion of catecholamines³, corticosteroids⁴ and adrenocorticotropin (ACTH; Axelrod & Reisine, 1984). The regulation of these hormones involves a complex interaction

between multiple hormones (Axelrod & Reisine, 1984). The sympathetic nervous system (SNS) and hypothalamic-pituitary-adrenal (HPA) axis are the two systems involved in the production of stress hormones (Schneiderman et al., 2005).

In a simplified model, Lupien et al. (2007) describes the regulation of glucocorticoids and catecholamines in the HPA axis:

1. A situation is interpreted as stressful (absolute or relative)
2. The hypothalamus secretes corticotropin releasing hormone (CRH)
3. The pituitary gland is activated by the CRH, causing it to secrete ACTH
4. The elevated levels of ACTH cause the adrenal gland to secrete glucocorticoids and catecholamines.

In parallel to this HPA activity, SNS activity causes the adrenal medulla to produce catecholamines, such as epinephrine (Schneiderman et al., 2005).

Cortisol and catecholamines

Both cortisol and catecholamines regulate energy availability throughout the body (Lupien et al., 2007; Schneiderman et al., 2005). Since the activation of the HPA axis prototypically occurs when there is a threat to the physical integrity of the organism (Dickerson & Kemeny, 2004), the secretion of stress hormones

³ Catecholamines are neurotransmitters and hormones such as dopamine, epinephrine (adrenaline) and norepinephrine (noradrenaline).

⁴ Corticosteroids is a group of steroid hormones secreted by the adrenal cortex. Glucocorticoids (stress response; anti-inflammatory; fat, protein and carbohydrate utilization) and mineralocorticoids (salt and water regulation) are the main types of corticosteroids. Corticosterone, cortisone and hydrocortisone are different types of glucocorticoids. (Morton & Hall, 1999)

is normally an adaptive mechanism (Schneiderman et al., 2005). However, if the cortisol secretion system does not shut down properly when there is no longer a threat, the resulting overexposure to cortisol may have negative health effects (Dickerson & Kemeny, 2004; Schneiderman et al., 2005). Further, chronic activation of the SNS leads to elevated resting blood pressure caused by hypertrophy in vasoconstrictor muscles (Schneiderman et al., 2005).

While cortisol functions as an anti-inflammatory agent (Dickerson & Kemeny, 2004), the stress response has different effects on the immune system depending on the nature of the stressor (Segerstrom & Miller, 2004). However, chronic stressors affect the immune system in a potentially detrimental manner, whereas acute stressors have more adaptive effects on the immune system (Segerstrom & Miller, 2004). This negative effect is produced when chronically elevated cortisol levels desensitize white blood cells to cortisol, reducing their ability to respond to anti-inflammatory signals otherwise needed in response to non-specific inflammation caused by disease (Segerstrom & Miller, 2004). In other words, chronically activating a system designed to respond to acute danger has deleterious health effects (Sapolsky, 2004).

Stress recovery

Therefore, the recovery process becomes central. As mentioned in the ICD-10-SE (Socialstyrelsen, 2016), continuous stress, i.e. stress without recovery, may lead to exhaustion syndrome (table 2). A reasonable hypothesis could be that an exhausted individual has interpreted various situations as stressful at such a pace

so as to outrun the recovery from previous cortisol responses. Interestingly, the recovery rate changes depending on the corticosteroid levels (McKay & Cidlowski, 2003) and, as mentioned before, the type of stressor (Dickerson & Kemeny, 2004).

According to McKay & Cidlowski (2003), the plasma cortisol half-life differs between normal and high levels of cortisol, ranging from 66 minutes to 120 minutes respectively. This indicates that a negative spiral may be possible, where recovery rates decrease as cortisol levels increase. In part, the prolonged half-life of cortisol during high steroid loads may explain the increased duration of cortisol changes elicited by uncontrollable social evaluation, as observed by Dickerson & Kemeny (2004).

What is stress related mental illness? User group description

Being stressed is not a sickness (Åsberg et al., 2010). However, if the stress is characterized as acute or prolonged with insufficient recovery, it may lead to illness (Åsberg et al., 2010). Stress is correlated with mortality in cardiovascular disease and affects other bodily diseases (Åsberg et al., 2010).

Therefore, stress reduction may positively health in cases beyond stress related mental illness. This makes the work of NBR development relevant to a broader user group than persons suffering from mental illness as a consequence of stress.

However, the end user group of this study consists of persons with stress related mental illness. According to the current international classification of diseases (Socialstyrelsen, 2016), stress

related mental illness is a category of illnesses consisting of four types of diagnoses:

- acute stress disorder (F43.0)
- post-traumatic stress disorder (F43.1)
- adjustment disorder (F43.2)
- exhaustion syndrome (F43.8A).

The disorders in the F43 disease category are all direct consequences of either an acute trauma or prolonged strain (Socialstyrelsen, 2016) (table 2).

Considering the short duration and acute nature of the acute stress disorder (F43.0), it seems reasonable to assume that persons with this condition are uncommon in NBR facilities such as the study cases in this thesis. This particular user group seems more relevant in facilities dealing with severe acute stress, such as hospitals. In line with this notion, post-traumatic stress disorder and exhaustion syndrome cause work ability impairment to a higher degree than acute

stress disorder and adjustment disorder (Försäkringskassan, 2016).

Table 2: Classification of stress related mental illness

Stressor type	Diagnosis	Symptoms	Duration
Trauma, acute reaction	Acute stress disorder (F43.0)	Delusion, incapacity to perceive stimuli, disorientation, flight, agitation, hyperactivity, panic attacks, palpitation, sweating, partial or total amnesia	Up to days
Trauma, prolonged or postponed reaction	Post-traumatic stress disorder (F43.1)	Intrusive memories of the trauma, emotional numbness, avoidance of situations similar to traumatic experience, insomnia, anxiety, depression, suicidal thoughts	Up to years
Life crisis (e.g. loss, separation, emigration, parenthood, retirement)	Adjustment disorder (F43.2)	Subjective unpleasantness, impaired social ability, anxiety, feelings of powerlessness or inability to plan, lowered ability to complete daily chores, episodes of depression	Up to months
Prolonged, continuous stress (non-life-threatening)	Exhaustion syndrome (F43.8A)	Extreme physical and psychological tiredness, disturbances in cognition, sleep or mood. Probable stress sensitivity even after remission	Up to years

Note. This overview of stress related mental illnesses was compiled from descriptions by Åsberg et al. (2010) and Socialstyrelsen (2016). Not all symptoms are listed.

Nature's healing mechanisms

Four mechanisms linking nature to health

As mentioned earlier, there are multiple mechanisms through which natural environments may promote health. Van den Berg et al. (2013) reviewed different possible mechanisms and state that there are four well-established links between nature and health benefits, namely:

1. improvement in air quality
2. stimulation of physical activity
3. facilitation of social cohesion
4. restoration from, or reduction in, stress and mental fatigue

In Ulrich's study (1984), the surgical patients were affected by a view of nature through a window without actually going out in nature. This suggests that a perceptual or psychological mechanism is at play (van den Berg et al., 2013). The fourth factor mentioned above includes both stress reduction and restoration from mental fatigue since these are two perspectives of this psychological effect. These two views have been discussed in other studies, where stress reduction was found to be "the most plausible and comprehensive explanation for health benefits of nature" (Health Council of the Netherlands, 2004; Tigerschiöld, 2017; van den Berg et al., 2013, p. 54).

The notion of stress reduction being the chief mechanism linking nature to health benefits, proposed by van den Berg et al. (2013), considers not only stress reduction versus restoration from mental fatigue, but also stress reduction in comparison to improvements in air quality, stimulation of physical activity and facilitation of social cohesion.

However, as mentioned by van den Berg et al. (2013), it is the link between nature and these mechanisms that is weak, while the link is strong between health benefits and physical activity, air quality and social cohesion respectively (van den Berg et al., 2013). This implies that any efforts that increase the strength of these factors in a given situation may also lead to health benefits.

Stress reduction in focus

While working with all possible health promoting mechanisms appears beneficial in a generic human population, it seems reasonable to assume that the need for stress reduction is highly relevant for individuals with stress related mental illness. This assumption, together with the notion that stress reduction may be the chief mechanism linking nature to health benefits, is the motivation behind the stress reduction focus in this thesis.

Stress reducing environments approach non-stressfulness

It is the body that reduces stress levels, by metabolizing cortisol in the liver, for example (McKay & Cidlowski, 2003). Therefore, there are no stress reducing environments. The environment may only cause a reduction of the rates of stress hormone secretion. This, coupled with the natural metabolism and excretion of stress hormones enables stress levels to decline.

This distinction is subtle, but it refocuses the aim of the health promoting environment from stress reduction to approaching non-stressfulness. Thinking of health promotion in terms of non-stressfulness instead of stress reduction may remove

one layer of possible confusion regarding the issue of this thesis.

Non-stressfulness is subjective

The qualities of a non-stressful environment differs from individual to individual, since the relative stress response depends on the individual's interpretation (Lupien et al., 2007). Therefore, a non-stressful environment contains a range of different environments, each fitting to a specific individual at a specific time. It seems reasonable to suggest that creating a non-stressful environment involves defining the framework in which this range of different environments may exist. This framework should encompass an array of environments such that it suits to the entire range of individuals within the user group.

Different environments for different stress levels

Grahn & Stigsdotter (2010) described eight perceived sensory dimensions: *nature*, *culture*, *prospect*, *social*, *rich in species*, *refuge*, and *serene*. In line with the subjective nature of a non-stressful environment, the authors found that the dimensions *refuge* and *nature* were preferred by highly stressed individuals. These preferences were not found across a general population, indicating a difference in preference in relation to stress levels. Ottosson (2007) experienced a progression through four phases over the course of his recovery from a brain injury, where different environmental qualities were beneficial in different phases.

Further reinforcing this point, Pálsdóttir et al. (2014) identified three phases in the rehabilitation process for individuals

with stress related mental illness: *prelude*, *recuperating* and *empowerment*. These phases are ordered by rising mental strength, where *empowerment* correlates with the highest mental strength. While nature is supportive in each of these phases, individuals in different phases needed different physical and operational elements in the rehabilitation garden (Pálsdóttir et al., 2014).

It may seem obvious that different people need different situations to recover from stress, but the temptation of producing a "one size fits all" solution needs some resistance. Further, these studies clearly show that there is a progression through different phases of the rehabilitation process. This progression is described as the *gradient of challenge* (Bengtsson & Grahn, 2014).

An individual with high mental strength may benefit from complex, challenging and/or social interactions with their environment (Bengtsson & Grahn, 2014; Grahn & Stigsdotter, 2010; Ottosson, 2007; Pálsdóttir et al., 2014). In parallel, an individual with low mental strength may benefit from non-demanding, socially silent and serene environments (Bengtsson & Grahn, 2014; Grahn & Stigsdotter, 2010; Ottosson, 2007; Pálsdóttir et al., 2014).

The QET respects variation

Therefore, any method for developing NBR facilities should respect these phases and provide the variation needed to benefit individuals going through different phases of mental strength. The main method used in this thesis, the QET, is a holistic, qualitative inventory tool capturing both the variety discussed above and the gradient of challenge (Bengtsson & Grahn, 2014).

Demands and control

It seems reasonable to compare the concept of demands to the sense of control; if a situation demands an individual's attention, then part of the individual's ability to act solely on their own will has been compromised. The individual is pressed to meet the demands. Demanding environments often have a social element present (Bengtsson & Grahn, 2014). Therefore, a failure to meet the demands threatens social evaluation. A threat of social evaluation is a potent stressor (Dickerson & Kemeny, 2004; Lupien et al., 2007), making failure to meet the demands a highly undesirable option for a stressed individual. This shows how a demanding situation may cause a sense of lacking control. The lack of control is a potential stressor (Lupien et al., 2007), which could explain why sensitive individuals benefit from less demanding environments (Bengtsson & Grahn, 2014). In other words, creating low-demand environments is analogous to creating stress reducing environments for individuals sensitive to a lacking sense of control.

Empirical study

Results from Framnäs Gård

Spatial identification

At Framnäs Gård, fourteen distinct garden spaces were found (figure 7). These areas were labeled with roman numbers *I-XIV*. The manager of Framnäs Gård was involved in this process and has confirmed the relevance and accuracy of this spatial division. Below, each area is briefly presented. The photographs do not always show the entire area.

While the large animal enclosures in the property's eastern part and the driveway are walkable to some extent, an interview with the facility's manager indicated that they have different roles than the other areas integral to the garden itself. The large animal enclosures, fenced with electrical wiring, did not immediately allow the garden user to spontaneously enter and may be seen as part of the surroundings of the main garden. Therefore, these areas were not labeled in this spatial identification.

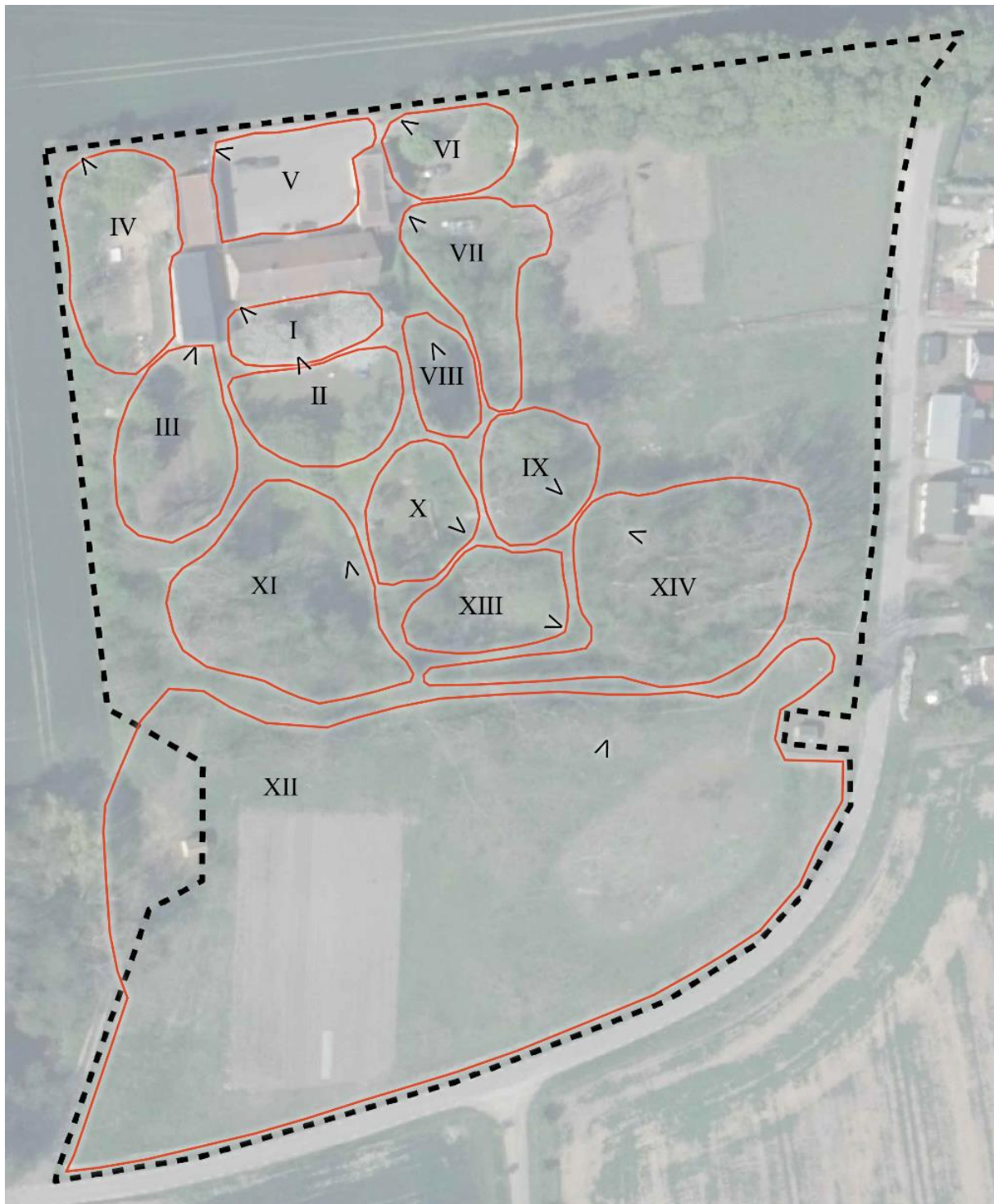


Figure 7: Distinct spaces found in the rehabilitation garden at Framnäs Gård, labeled with area codes I-XIV. Photograph positions are marked with an angular shape, where the open end represents the facing direction. Illustration: Fredrik Tigerschiöld. Base map data: © Lantmäteriet.



Figure 8: Area I, a herbal garden directly in connection to the facility's largest private building. The room was identified via its delimitations consisting of the surrounding woods and two buildings.



Figure 9: Area II, a small grass patch connected to area I. The room was identified via its delimitations consisting of the surrounding woods and a short wall.



Figure 10: Area III, a space in front of the stable entrance with a small sheep pen. The room was identified via its delimitations consisting of the surrounding buildings, animal enclosures and vegetation.



Figure 11: Area IV, a storage area with various animal pens in connection to a main building. The room was identified via its delimitations consisting of the surrounding buildings, animal enclosures and vegetation.



Figure 12: Area V, a gravel courtyard enclosed by three private buildings and a short wall. The room was identified via its delimitations consisting of the surrounding buildings and wall.



Figure 13: Area VI, a gravel parking space for visitors. The room was identified via its delimitations consisting of a building, an animal enclosure and vegetation.



Figure 14: Area VII, a grassy space with greenhouse and paths leading to the east and south. The room was identified via its delimitations consisting of the surrounding vegetation and a building.



Figure 15: Area VIII, a lush area with several multi-trunk hazel trees offering hideouts. The room was identified via its delimitations consisting of the surrounding vegetation.



Figure 16: Area IX, a wooded area with an intersection of paths. The room was identified via its delimitations consisting of the surrounding vegetation and animal enclosures.



Figure 17: Area X, an open area with large fallen trees offering places to sit with various views. The room was identified via its delimitations consisting of the surrounding vegetation.



Figure 18: Area XI, a grassy area with a vast view to the south and a small wooded sheep pasture. The room was identified via its delimitations consisting of the surrounding vegetation and animal enclosures.



Figure 19: Area XII, a large, open meadow with a historical site and small-scale farming. The room was identified via its delimitations consisting of a road and vegetation.



Figure 20: Area XIII, a small, wooded pond area with varying water levels. The room was identified via its delimitations consisting of the surrounding vegetation.



Figure 21: Area XIV, a wooded area with various views of the surroundings. The room was identified via its delimitations consisting of the surrounding vegetation and animal enclosures.

QET unsorted, December

The first QET landscape analysis was done in December over the course of two days. The results from this analysis has been compiled in table 3 from the raw results (appendix II).

As is apparent in table 3, there is variation in the prevalence of different qualities. For example, *familiarity* was found in all areas while *different options in different kinds of weather* was found unequivocally in one area. Further, there is variation in the number of qualities present in each area. To visualize this variation in quality presence and area quality richness, two graphs were produced per visit (figure 22, 23, 24 and 25).

Table 3: The unsorted results from the QET landscape analysis at Framnäs Gård (December).

Label	Quality	Quality prevalence in area														Sum		
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	Σ(S)	Σ(W)	Σ(-)
A1	Closeness and easy access	S	S	S	S	S	S	S	W	W	S	S	-	-	W	9	3	2
A2	Enclosure and entrance	S	W	W	S	S	S	W	S	S	W	W	-	W	S	7	6	1
A3	Safety and security	S	W	W	W	-	-	W	W	S	W	W	W	-	S	3	8	3
A4	Familiarity	S	S	S	S	S	S	S	S	S	S	S	S	S	S	14	0	0
A5	Orientation and way finding	S	S	S	S	S	W	S	-	S	S	S	S	W	S	11	2	1
A6	Different options in different kinds of weather	W	-	-	W	-	-	S	W	-	W	W	-	-	-	1	5	8
B1	Joyful and meaningful activities	S	S	W	S	-	-	S	W	S	S	S	S	W	S	9	3	2
B2	Contact with surrounding life	W	-	S	S	S	S	S	-	S	S	S	S	-	S	10	1	3
B3	Social opportunities	S	W	S	W	-	-	S	-	W	S	S	S	W	W	6	5	3
B4	Culture and connection to past times	S	S	S	S	S	S	S	-	W	W	S	S	-	S	10	2	2
B5	Symbolism/reflection	S	S	S	S	-	S	S	S	S	S	S	S	S	S	13	0	1
B6	Prospect	S	W	S	S	S	S	S	-	W	W	S	S	-	S	9	3	2
B7	Space	S	S	S	W	S	S	W	S	S	S	S	S	S	S	12	2	0
B8	Rich in species	S	W	-	W	-	W	S	W	S	S	S	S	S	S	8	4	2
B9	Sensual pleasures of nature	S	S	-	W	-	-	S	S	S	S	S	S	W	S	9	2	3
B10	Seasons changing in nature	S	S	W	W	W	W	S	S	S	S	S	S	S	S	10	4	0
B11	Serene	W	-	-	W	-	-	-	S	W	W	S	S	S	S	5	4	5
B12	Wild nature	-	-	-	-	-	-	W	S	S	S	S	W	S	S	6	2	6
B13	Refuge	-	-	-	S	-	-	S	S	S	W	S	S	S	S	8	1	5
Σ(S)		14	9	9	10	8	8	14	9	13	12	16	14	8	16			
Σ(W)		3	5	4	8	1	3	4	5	5	7	3	2	5	2			
Σ(-)		2	5	6	1	10	8	1	5	1	0	0	3	6	1			

Note. A strong quality presence is not automatically positive. The sums on the right show the number of areas that hold a given quality. The sums on the bottom show the number of qualities in a given area. Dashes (-) indicate quality not present. S = strong/unequivocal quality presence; W = weak/ambiguous quality presence.

QET unsorted, April

The second QET landscape analysis was done in April over the course of one day. The results from this analysis has been compiled in table 4 from the raw results (appendix IV).

Table 4: The unsorted results from the QET landscape analysis at Framnäs Gård (April).

Label	Quality	Quality prevalence in area														Sum		
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	Σ(S)	Σ(W)	Σ(-)
A1	Closeness and easy access	S	S	S	W	S	S	S	W	S	S	S	-	-	W	9	3	2
A2	Enclosure and entrance	S	W	-	S	S	W	S	S	W	W	W	-	S	S	7	5	2
A3	Safety and security	W	W	W	S	-	-	S	S	S	S	W	W	W	S	6	6	2
A4	Familiarity	S	S	-	S	S	S	S	S	S	S	S	S	S	S	13	0	1
A5	Orientation and way finding	S	S	S	S	S	W	S	S	S	S	S	S	W	S	12	2	0
A6	Different options in different kinds of weather	W	-	W	S	-	-	S	W	W	W	W	-	W	W	2	8	4
B1	Joyful and meaningful activities	S	S	S	S	-	-	S	-	S	S	S	S	S	S	11	0	3
B2	Contact with surrounding life	W	W	S	S	S	S	W	-	S	S	S	S	-	S	9	3	2
B3	Social opportunities	S	-	W	S	-	W	S	-	-	S	W	S	-	W	5	4	5
B4	Culture and connection to past times	S	S	S	S	S	S	S	-	W	S	S	S	-	S	11	1	2
B5	Symbolism/reflection	S	S	S	S	-	S	S	S	S	S	S	S	S	S	13	0	1
B6	Prospect	S	S	S	S	S	S	W	-	S	S	S	S	-	S	11	1	2
B7	Space	S	S	W	S	S	W	S	S	S	S	S	S	S	S	12	2	0
B8	Rich in species	S	W	-	S	-	W	S	W	S	S	S	S	S	S	9	3	2
B9	Sensual pleasures of nature	S	W	W	S	-	W	S	S	S	S	S	S	S	S	10	3	1
B10	Seasons changing in nature	S	S	S	S	W	W	S	S	S	S	S	S	S	S	12	2	0
B11	Serene	S	S	-	S	-	-	S	W	S	W	S	S	W	S	8	3	3
B12	Wild nature	-	-	-	-	-	-	S	S	S	S	S	S	S	S	8	0	6
B13	Refuge	-	-	W	S	-	-	S	S	-	-	S	S	S	S	7	1	6
Σ(S)		14	10	8	17	8	6	17	10	14	15	15	15	10	16			
Σ(W)		3	5	6	1	1	7	2	4	3	3	4	1	4	3			
Σ(-)		2	4	5	1	10	6	0	5	2	1	0	3	5	0			

Note. A strong quality presence is not automatically positive. The sums on the right show the number of areas that hold a given quality. The sums on the bottom show the number of qualities in a given area. Dashes (-) indicate quality not present. S = strong/unequivocal quality presence; W = weak/ambiguous quality presence.

QET sorted, December

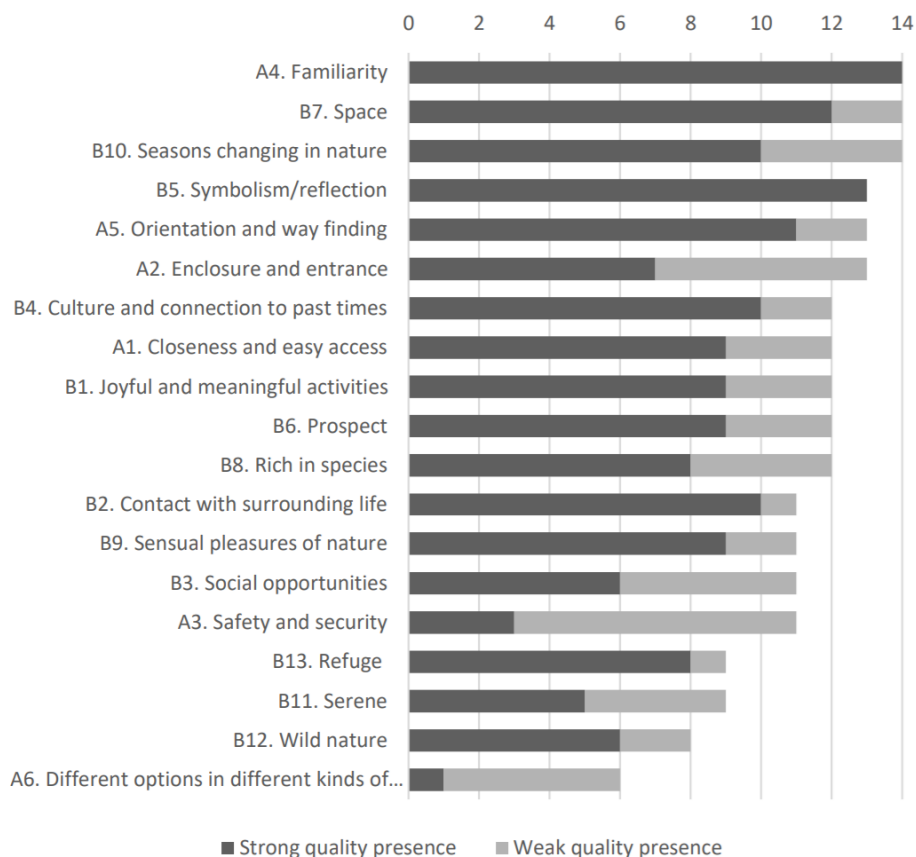


Figure 22: QET quality prevalence at Framnäs Gård in December. The figure shows the number of areas with a given quality sorted by least number of areas lacking the quality, then by least number of areas with a weak quality presence. The columns of sums found in table 3, $\Sigma(W)$ and $\Sigma(-)$, were used to produce this figure. *Familiarity*, *space* and *seasons changing in nature* were found with varying strength in all 14 areas. The least common quality was *different options in different kinds of weather*, being strongly present in one area and weakly present in five areas.

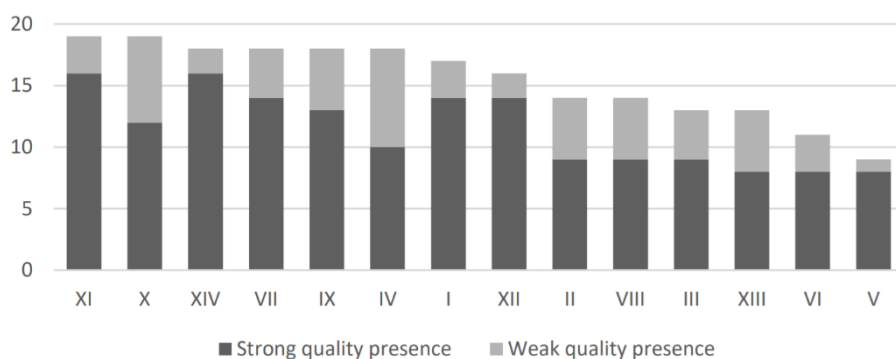


Figure 23: Number of QET qualities per area at Framnäs Gård in December in areas I-XIV. The bars are sorted by least number of lacking qualities per area, then by least number of weak qualities per area. The rows of sums in table 3, $\Sigma(W)$ and $\Sigma(-)$, were used to produce this figure. In areas XI and X, all 19 qualities were found with varying strength. In area V, the least number of QET qualities was found (9).

QET sorted, April

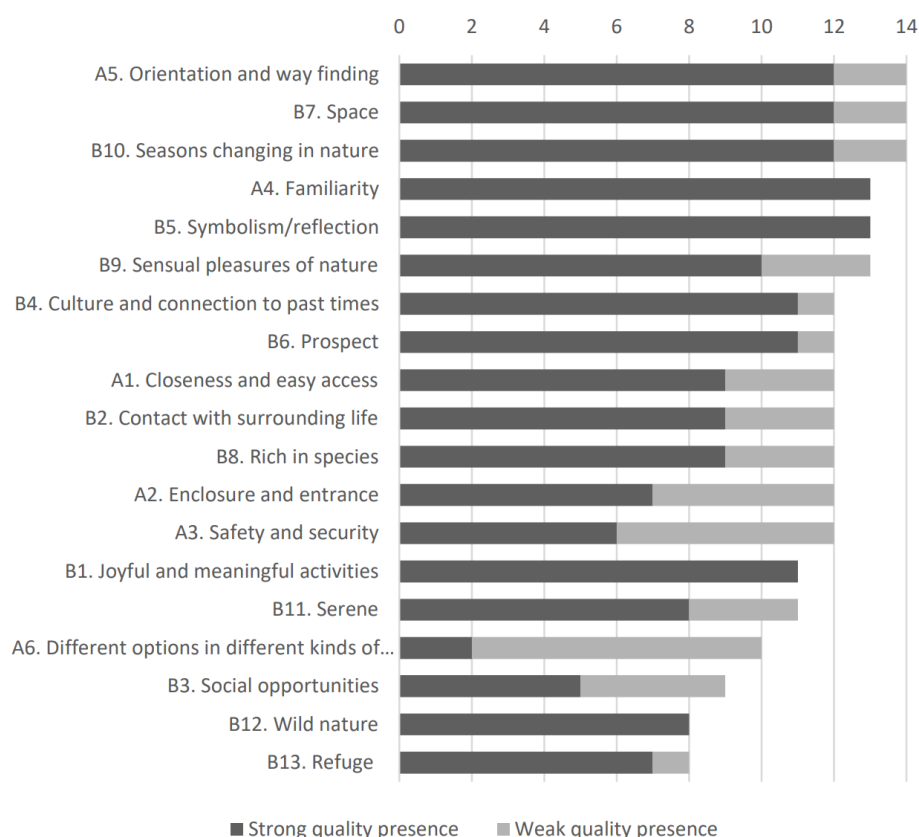


Figure 24: QET quality prevalence at Framnäs Gård in April. The figure shows the number of areas with a given quality sorted by least number of areas lacking the quality, then by least number of areas with a weak quality presence. The columns of sums found in table 4, $\Sigma(W)$ and $\Sigma(-)$, were used to produce this figure. *Orientation and way finding*, *space* and *seasons changing in nature* were found with varying strength in all 14 areas. The least common unambiguously present quality was *different options in different kinds of weather*, being strongly present in two areas and weakly present in five areas.

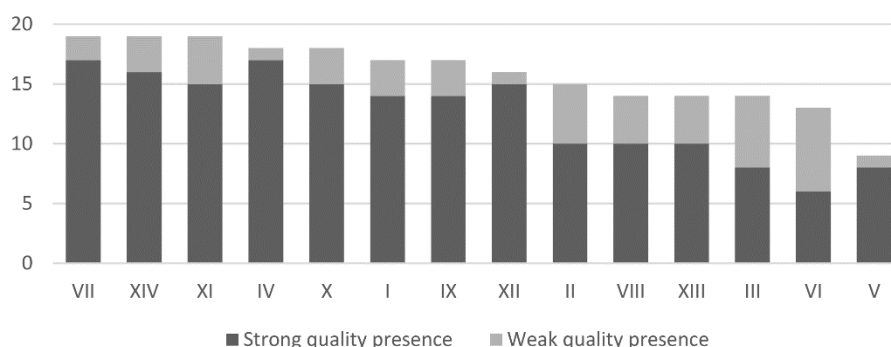


Figure 25: Number of QET qualities per area at Framnäs Gård in April in areas I-XIV. The bars are sorted by least number of lacking qualities per area, then by least number of weak qualities per area. The rows of sums in table 4, $\Sigma(W)$ and $\Sigma(-)$, were used to produce this figure. In areas VII, XI and XIV, all 19 qualities were found with varying strength. In area V, the least number of QET qualities was found (9).

Results from Lyngby Skola

Spatial identification

At Lyngby Skola, twelve distinct garden spaces were found (figure 26). These areas were labeled with roman numbers *I-XII*. The staff of Lyngby Skola was involved in this process and has confirmed the relevance and accuracy of this spatial division. Below, each area is briefly presented. The photographs do not always show the entire area.



Figure 26: Distinct spaces found in the rehabilitation garden at Lyngby Skola, labeled with area codes I-XII. Photograph positions are marked with an angular shape, where the open end represents the facing direction. Illustration: Fredrik Tigerschiöld. Base map data: © Lantmäteriet.



Figure 27: Area I, a crossroads connecting paths to the garden to the main building. The room was identified via its delimitations consisting of the surrounding buildings, structures and vegetation.



Figure 28: Area II, a greenhouse with a view over the surrounding farmland. The room was identified via its delimitations consisting of the surrounding vegetation.



Figure 29: Area III, the remains of an old building with many places to sit. The room was identified via its delimitations consisting of the surrounding buildings, structures and vegetation.



Figure 30: Area IV, a path from the parking space with lush greenery. The room was identified via its delimitations consisting of the surrounding structures and vegetation.



Figure 31: Area V, an enclosed sitting area close to the main building. The room was identified via its delimitations consisting of the building and surrounding structures and vegetation.



Figure 32: Area VI, a place for horticulture by the parking space. The room was identified via its delimitations consisting of the surrounding structures and vegetation.



Figure 33: Area VII, a more private entryway to the garden from the parking space. The room was identified via its delimitations consisting of the building and surrounding structures and vegetation.



Figure 34: Area VIII, an open field with a secluded fireplace. The room was identified via its delimitations consisting of the surrounding farmland, driveway and structures.



Figure 35: Area IX, the chicken pen area with multiple conifer trees. The room was identified via its delimitations consisting of the surrounding structures and vegetation.



Figure 36: Area X, a grassy pathway connecting the chicken pen area to the rest of the garden. The room was identified via its delimitations consisting of the surrounding structures and vegetation.



Figure 37: Area XI, a secluded and peaceful sitting area. The room was identified via its delimitations consisting of the surrounding structures and vegetation.



Figure 38: Area XII, the courtyard enclosed by the main building and a high wall. The room was identified via its delimitations consisting of the surrounding buildings, structures and vegetation.

QET unsorted, December

The first QET landscape analysis was done in December over the course of two days. The results from this analysis has been compiled in table 5 from the raw results (appendix III).

Table 5: The unsorted results from the QET landscape analysis at Lyngby Skola (December).

Label	Quality	Quality prevalence in area												Sum		
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	$\Sigma(S)$	$\Sigma(W)$	$\Sigma(-)$
A1	Closeness and easy access	S	S	S	S	S	S	S	S	-	W	S	S	10	1	1
A2	Enclosure and entrance	W	S	-	S	S	W	S	W	S	W	W	S	6	5	1
A3	Safety and security	S	S	W	S	S	S	S	W	S	W	S	W	8	4	0
A4	Familiarity	S	S	W	S	S	S	S	W	S	S	S	S	10	2	0
A5	Orientation and way finding	S	S	W	S	W	S	S	S	W	S	S	W	8	4	0
A6	Different options in different kinds of weather	W	S	-	W	W	-	W	-	-	-	-	-	1	4	7
B1	Joyful and meaningful activities	-	S	W	W	S	S	S	S	S	W	W	S	7	4	1
B2	Contact with surrounding life	W	S	S	S	-	S	W	S	S	-	W	-	6	3	3
B3	Social opportunities	W	S	S	W	S	S	S	S	S	-	S	W	8	3	1
B4	Culture and connection to past times	S	S	S	W	W	S	S	S	S	W	W	S	8	4	0
B5	Symbolism/reflection	S	S	S	W	W	S	S	S	W	W	-	S	7	4	1
B6	Prospect	W	S	S	W	-	S	S	S	S	-	W	-	6	3	3
B7	Space	-	S	W	W	S	-	S	S	S	W	S	S	7	3	2
B8	Rich in species	S	S	-	S	S	S	S	S	W	S	W	S	9	2	1
B9	Sensual pleasures of nature	W	S	S	S	W	S	S	W	S	S	S	S	9	3	0
B10	Seasons changing in nature	S	S	S	S	S	S	S	S	-	S	S	S	11	0	1
B11	Serene	-	S	-	W	W	W	S	W	S	-	W	W	3	6	3
B12	Wild nature	-	-	-	-	-	-	-	W	W	-	-	W	0	3	9
B13	Refuge	-	S	-	S	W	-	S	W	S	-	S	-	5	2	5
$\Sigma(S)$		8	18	8	10	9	13	16	11	12	5	9	10			
$\Sigma(W)$		6	0	5	8	7	2	2	7	4	7	7	5			
$\Sigma(-)$		5	1	6	1	3	4	1	1	3	7	3	4			

Note. A strong quality presence is not automatically positive. The sums on the right show the number of areas that hold a given quality. The sums on the bottom show the number of qualities in a given area. Dashes (-) indicate quality not present. S = strong/unequivocal quality presence; W = weak/ambiguous quality presence.

QET unsorted, April

The second QET landscape analysis was done in April over the course of one day. The results from this analysis has been compiled in table 6 from the raw results (appendix V).

Table 6: The unsorted results from the QET landscape analysis at Lyngby Skola (April).

Label	Quality	Quality prevalence in area												Sum		
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	$\Sigma(S)$	$\Sigma(W)$	$\Sigma(-)$
A1	Closeness and easy access	S	S	S	S	S	S	S	W	-	W	S	S	9	2	1
A2	Enclosure and entrance	S	S	-	S	S	-	W	W	S	W	S	S	7	3	2
A3	Safety and security	S	S	S	S	S	W	W	S	S	W	S	W	8	4	0
A4	Familiarity	S	S	S	S	S	S	S	S	S	S	S	S	12	0	0
A5	Orientation and way finding	S	S	S	S	S	S	S	S	S	S	S	S	12	0	0
A6	Different options in different kinds of weather	W	S	-	-	W	-	-	-	-	-	W	W	1	4	7
B1	Joyful and meaningful activities	W	S	S	S	S	S	S	S	S	W	S	S	10	2	0
B2	Contact with surrounding life	W	S	S	S	-	S	S	S	S	-	-	-	7	1	4
B3	Social opportunities	-	S	S	S	S	S	W	S	W	-	S	S	8	2	2
B4	Culture and connection to past times	S	S	S	S	S	S	S	S	S	-	S	S	11	0	1
B5	Symbolism/reflection	S	S	S	S	S	S	S	S	S	S	S	S	12	0	0
B6	Prospect	-	S	S	S	-	S	W	S	S	-	-	-	6	1	5
B7	Space	W	S	W	S	S	-	W	S	S	S	S	S	8	3	1
B8	Rich in species	S	S	S	S	S	S	S	S	S	S	S	S	12	0	0
B9	Sensual pleasures of nature	W	S	S	S	S	S	S	S	S	S	S	S	11	1	0
B10	Seasons changing in nature	S	S	S	S	S	S	S	S	W	S	S	S	11	1	0
B11	Serene	W	S	-	-	S	-	-	W	-	-	S	W	3	3	6
B12	Wild nature	-	-	W	-	W	-	-	W	W	-	-	W	0	5	7
B13	Refuge	-	S	-	S	S	-	W	S	W	-	S	-	5	2	5
$\Sigma(S)$		9	18	13	16	15	12	10	14	12	7	15	12			
$\Sigma(W)$		6	0	2	0	2	1	6	4	4	4	1	4			
$\Sigma(-)$		4	1	4	3	2	6	3	1	3	8	3	3			

Note. A strong quality presence is not automatically positive. The sums on the right show the number of areas that hold a given quality. The sums on the bottom show the number of qualities in a given area. Dashes (-) indicate quality not present. S = strong/unequivocal quality presence; W = weak/ambiguous quality presence.

QET sorted, December

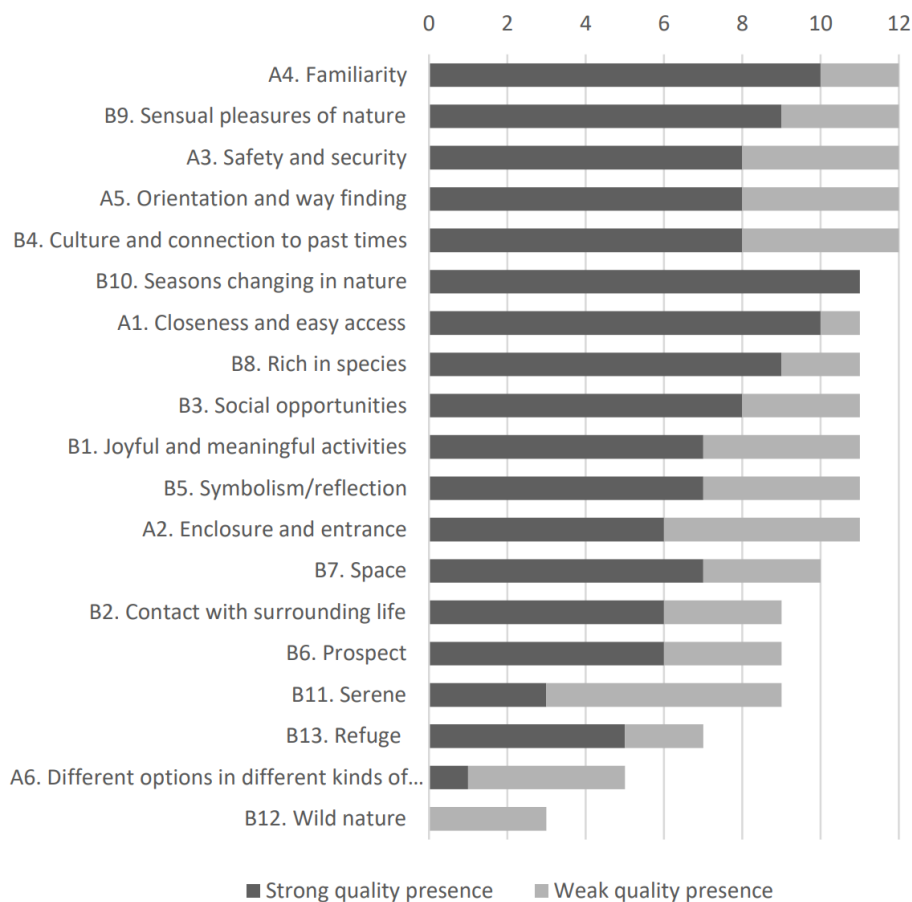


Figure 39: QET quality prevalence at Lyngby Skola in December. The figure shows the number of areas with a given quality sorted by least number of areas lacking the quality, then by least number of areas with a weak quality presence. The columns of sums found in table 5, $\Sigma(W)$ and $\Sigma(-)$, were used to produce this figure. All comfortable qualities except *different options in different kinds of weather* were found in 11 or more of the 12 areas at Lyngby Skola. *Wild nature* was not found as a strong quality in any area. Only one area could unambiguously provide *different options in different kinds of weather*.

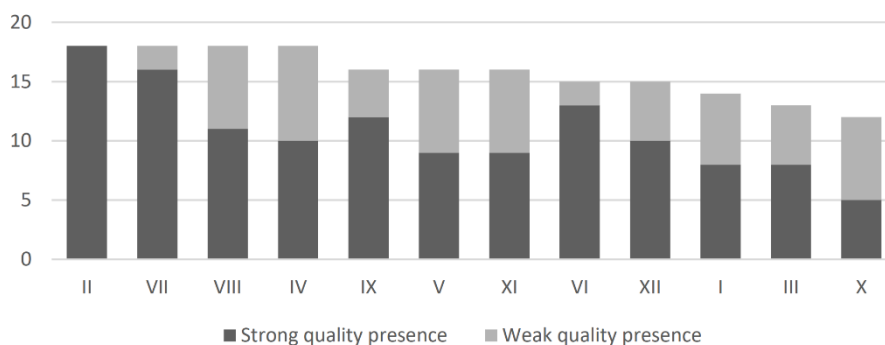


Figure 40: Number of QET qualities per area at Lyngby Skola in December in areas I-XII. The bars are sorted by least number of lacking qualities per area, then by least number of weak qualities per area. The rows of sums in table 5, $\Sigma(W)$ and $\Sigma(-)$, were used to produce this figure. Areas II and VII were found to hold the largest number of strong QET qualities (18 and 16 respectively). Area IV held 18 qualities, but eight of them were weak or ambiguous.

QET sorted, April

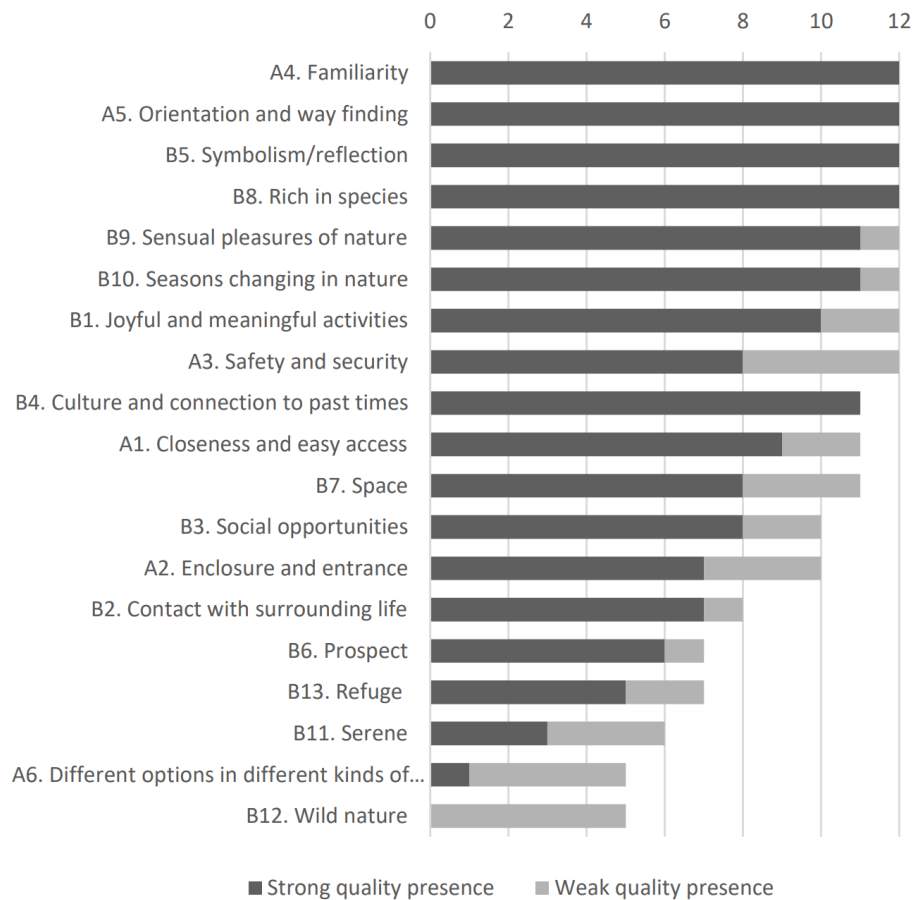


Figure 41: QET quality prevalence at Lyngby Skola in April. The figure shows the number of areas with a given quality sorted by least number of areas lacking the quality, then by least number of areas with a weak quality presence. The columns of sums found in table 6, $\Sigma(W)$ and $\Sigma(-)$, were used to produce this figure. All comfortable qualities except *different options in different kinds of weather* were found in 10 or more of the 12 areas at Lyngby Skola. *Wild nature* was not found as a strong quality in any area. Only one area could unambiguously provide *different options in different kinds of weather*.

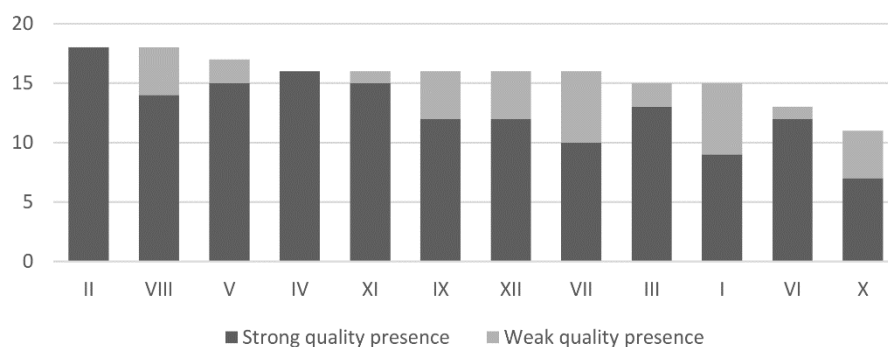


Figure 42: Number of QET qualities per area at Lyngby Skola in April in areas I-XII. The bars are sorted by least number of lacking qualities per area, then by least number of weak qualities per area. The rows of sums in table 6, $\Sigma(W)$ and $\Sigma(-)$, were used to produce this figure. Areas II and IV were found to hold the largest number of strong QET qualities (18 and 16 respectively). Area VII held 16 qualities, but six of them were weak or ambiguous.

Discussion

This section begins with a brief discussion around the case study as a basis for evaluation. Thereafter, a general discussion around the QET method and a string of exploratory, interconnected discussions are presented. The aim of the discussion is primarily to evaluate the QET landscape analysis method and to find essential design implications of the QET.

The case study as a basis for evaluation

As this study aims to evaluate the QET method from the practicing landscape architect's view, the practical use of this quality evaluation tool has been fundamental. The tool is intended to be applied to real life settings. Therefore, the case study is essential.

It was during the practical use of the tool that the evaluation basis (of the landscape analysis in step 1 of the QET) was laid out:

- What are the qualities?
- How do the qualities manifest themselves in an environment?
- What aspects of the qualities are relevant to the user group?
- How could the data be collected, stored, processed, presented and interpreted?

Being forced to complete the landscape analysis forces the tool user to answer these questions. These questions (among others) and their answers are overarch-

ing to the previous sections and the following discussions. The following discussions consists of

- a result of the case study and findings from attempting to apply the tool
- an indirect evaluation of the tool applicability
- an attempt to understand and explore the QET itself.

Work process

For the intended scope of this thesis, using two cases seems appropriate. Data collection of QET landscape analysis material is time consuming when the tool user is unfamiliar with the tool. Even the minimal interview and observation material collected in this work was time consuming to process.

For the purpose of evaluating the QET landscape analysis (step 1), sufficient data has been collected to provide basis for discussions. The following discussions are the primary results of the case study. These discussions were often supported by the results from the landscape analysis. Therefore, the collected data has been providing support in line with the aim of this thesis. However, it seems that more data collection would consume valuable time while being largely unimportant for the quality of the discussions. This may be due to the general character of the discussions.

For the purpose of enhancing the gardens used as cases in this study (step 3 of the QET), sufficient landscape analysis data has been collected. A fully completed interview phase (step 2) would be required to provide confidence in the design process. Due to the scope of this thesis, and the extent of the QET evaluation

work, the design work is brief. To provide a more thorough design proposal, the QET evaluation discussions would need to be greatly reduced. Even then, only one case with a design proposal could possibly fit within the scope of this work.

Completing the landscape analysis two times, during different seasons, seems pragmatic both for the purpose of design and method evaluation. The use of a garden in Sweden may be entirely different in December compared to April. Experiencing the different areas with and without warmth is required to understand the garden's potential use patterns. For the design work, insight into use patterns is essential. For the QET method evaluation, the bi-seasonal analyses provided some additional support to the discussions by increasing the sample size.

An important element of the QET landscape analysis is the temporal dependency of some qualities and subjective nature of other qualities. Temporal dependency refers to the notion that the *serenity* quality, for example, may be experienced or not depending on wind direction, the temporary presence of others and the time of the day (see page 77). The subjectivity of some qualities (see page 56) introduces a high probability that the mood of the tool user on the particular day or hour of analysis will affect the results significantly. A larger sample size reduces the chances of using data that has been colored by such temporary features of the environment and tool user alike.

What could have been done differently

Initially, the aim was to use two other methods of analysis. This created a scope that was far too extensive and the work

that was put into these analyses was unnecessary. With an opportunity to redo this thesis, the limitations and method would be greatly narrowed from the beginning. Thus, the unnecessary dead ends would be avoided, and the time spared could be put into discussing one of the several ideas that were never realized in this thesis:

- Overlaying the result diagrams, both sorted and unsorted, to highlight differences both between the December and April analyses and between the two cases.
- Connecting the QET qualities and their promotion of spontaneous mindfulness via sensory stimuli to brain activity and mindfulness research.
- Discussing how some quality descriptors (appendix I) were more useful than others.
- Discussing individual quality descriptors (appendix 1).
- Processing sound recordings from the landscape analyses, where highly detailed observations and motivations for each data entry were logged.
- Writing about the meaningful experiences from the case gardens.
- Discussing the subjective analysis in relation to a normal distribution of human estimation.

The QET method in general

A highly useful tool

After some preparation work (discussed below), the QET is a user-friendly tool for understanding, discussing and describing an environment. The tool seems useful beyond healthcare settings and provides an instrument to rationally analyze

highly complex physical features. Providing a solid analysis background, the tool gives a promising foundation for design work. As is apparent in this thesis, the tool is customizable to the particular needs of both the tool user and garden user.

Using a checklist to keep track of ~170 physical features of 19 QET qualities

A first or second experience with using the QET seems to involve an initial learning or preparation phase where the tool user needs to familiarize themselves with the overall QET process and, in particular, the 19 qualities of the tool. In the case of this thesis, which was a second encounter with the QET, the familiarizing with qualities and preparation work consisted of carefully extracting quality describing phrases from what may be regarded as a foundational study of this thesis, namely Bengtsson & Grahn (2014). The authors describe each quality thoroughly, but complete articles are difficult to bring out in a field study. The list of descriptors (appendix I) that resulted from this extraction proved to be highly useful for accurately categorizing landscape features into the 19 quality categories of the QET while being out in the field. Using a checklist similar to the one compiled in this study seems necessary for an accurate analysis, as ~170 different aspects of 19 QET qualities may be difficult to keep track of. While this list was simple to create, the need to produce it may have implications concerning the QET user-friendliness.

Binary measurement

Bengtsson & Grahn (2014) state that the QET, as presented in their study, is an outline of the overall structure of the

tool, indicating that the tool in its current state is malleable. In a previous study, we used the QET in a healthcare setting and found the evaluation of qualities to be binary, reducing the precision of our evaluation (Brisard et al., 2018). An area examined in relation to the 19 qualities could only be evaluated to either holding a quality (1) or not (0). This could be interpreted as though the qualities have a binary nature (0-1). However, it seems likely that a given quality from the QET, such as *different options in different kinds of weather* (A6), could be more or less present in an area. Therefore, introducing a scale to each quality may be useful. This idea leads to at least two issues:

- What scale should be used? If not binary (0-1), should the scale add one more level of resolution (0-2), or more levels (0-N)?
- What are the physical determinants for each level on this scale? For example, if zero options in different kinds of weather are present, giving the score $A6 = 0$, does two options give the same score $A6 = 1$ as five options?

Subjective analysis

Analyzing an environment using the original QET qualities involves a high degree of subjectivity. The user of this quality evaluation tool must determine the presence of 19 complex qualities, for example:

- *safety and security*
- *familiarity*
- *joyful and meaningful activities*
- *serene*
- *refuge.*

Evaluating these qualities depend on the subjective capacity and experience or feeling of the tool user.

First, understanding what, for example, *safety and security* entails may be challenging. Without the extended list of descriptors (appendix I) extracted from Bengtsson & Grahm (2014), the tool user has to know the 30 or so aspects of this quality alone by heart. Even for a professional, this seems difficult and prone to inconsequential results. With the extended list of descriptors and qualities (appendix I), the risk of forgetting what to look for is somewhat reduced. If one's capacity to remember the many facets of the QET qualities may be regarded as an aspect of subjectivity, then the QET is slightly less subjective with this extended list of descriptors.

Second, the qualities and their respective elements are often subjective by nature. To demonstrate this, some particularly subjective quality descriptors and their parent quality are listed below:

- *enclosure and entrance*
 - enclosure corresponds to needs of safety and security
 - not confined
- *safety and security*
 - risk of intrusion
 - unwillingly being viewed by outsiders
 - garden users intruding on those indoors
 - those indoors intruding on garden users
 - ambiguous design
- *familiarity*
 - outdoor environment is a natural part of the setting
 - easy to familiarize with outdoor environment

- *orientation and way finding*
 - balance of complexity and unity
- *culture and connection to past times*
 - places offer fascination with human culture
 - memory-stimulating
 - special character
 - meaning
 - something to be proud of
- *symbolism/reflection*
 - elements provoking thoughts about relation between one's life and nature
- *space*
 - areas offering restful feeling of entering another world
- *serene*
 - undisturbed
 - not crowded
 - calming elements
 - relaxation
 - peace.

These quality elements require the subjective experience to exist, and are therefore fundamentally subjective. In contrast, *rich in species*, for example, requires no subjective experience to exist.

All subjective qualities have an element of interpretation in common, as does the stress response itself (Lupien et al., 2007). Considering this, a tool without subjective elements would be unable to examine a fundamental aspect of stress related mental illness. The subjectivity of the QET may be considered an inevitable source of error.

Also, the spatial identification may be regarded as moderately subjective. The experience of delimitations between rooms may differ between different tool users. Allowing the garden managers to confirm

the spatial identification may reduce this subjectivity. The subjectivity of the spatial identification may have a significant impact on the subjectivity of the landscape analysis results.

For the receiving stakeholder of a QET analysis, it may be highly important to know that the results are subjective and may differ depending on who did the analysis. The results can potentially differ between individual tool users, the individual's emotional state, the current weather and other specific site conditions. The interview part of the QET process addresses this issue to some degree, anchoring the results to the users and staff of the healthcare setting.⁵ Completing the analysis more than once, as in this thesis, reduces anomalies caused by temporary conditions.

Unassessed descriptors

When examining a landscape using the extended list of QET qualities and their descriptors (appendix I), the list of descriptors was supporting, not enforcing. Therefore, not all descriptors were assessed. This happened in situations where the parent QET quality assessment could be done directly and did not require any sub-assessments. For example, if the quality *closeness and easy access* was obviously present in an area, then the additional assessments of the descriptors were more time consuming than useful. However, situations that require a detailed documentation of results may still benefit from assessing these descriptors.

Interviews and observation

The primary goal of the interviews was to support the evaluation of step 1 in the QET and to increase the accuracy of the result analysis. While the interview material was not often directly referred to in the discussions, the material provided highly valuable general knowledge of the two cases. Otherwise hidden information, such as special uses of different areas or activities, was revealed in the interviews.

An example of this is with area VIII at Framnäs Gård, which is used as a *refuge* by garden users. This use was unapparent on site. In fact, the area itself was unapparent because of its highly enclosed and concealed character. Thus, without the interviews, this area could have been overseen in its entirety and any design recommendation made for this area would miss important background information regarding the area's use. In this case, missing such information could have led to mistakenly recommending a change in the quality composition of the area. A *refuge* may be sensitive to such changes, since increasing the area's attractiveness may be in direct conflict with the area's level of seclusion.

Presumably, a completed QET interview phase (step 2) would yield even more of this valuable information and further increase the accuracy of any design recommendation.

As the interviews were unstructured, there is a high probability that any interview findings contain a bias toward subjective interests of the interviewer and

⁵ The interview part of the QET (step 2) was not fully completed in this thesis, as previously noted.

interviewees. The material may be colored by the specific date, time and setting of the interviews. A structured interview, as QET step 2 is intended to be, would greatly reduce such biases.

To complement findings from the QET step 1 (landscape analysis), general observations were used. Noting objects with special character or function, particular experiences or other observations with potential value enabled a more detailed description of the project sites. Such information was difficult to fit within the QET matrix (appendix I). Chiefly, the observation notes had the same function in this thesis as the interviews.

The observations were also unstructured. Notes were taken on a somewhat arbitrary basis while experiencing the garden. Therefore, the observations were colored by attention-related tendencies, personal attitudes toward certain design elements and the specific time and date of the garden visits. However, to plan for completely structured observations of specific experiences or details seems difficult. If observations of specific physical aspects are sought after, they should perhaps be inserted into the QET matrix (appendix I). Thus, the subjective character of landscape observation may be necessary in this context. While the observation method and results of this thesis are probably flawed, it seems counter-productive to not use any such observations.

In conclusion, the interview and observation material provided essential information both in general and concerning details. This increased the accuracy of analyses, discussions and recommendations. A fully completed QET interview phase would further benefit the accuracy of this thesis.

QET qualities

Relative importance of qualities

The relative importance of the stressors differs, as discussed on page 22. In short, situations lacking in the sense of control, containing a social-evaluative threat or a combination of these two elicit the greatest stress responses (Dickerson & Kemeny, 2004). Drawing from this, there is a possibility that the relative importance of the QET qualities differs in a stress reduction context. Some additional attention is warranted toward qualities that contain social-evaluative threats or elicit a sense of lacking control.

Variation is an aspect of control and an overarching quality in the QET

Although there may be differences regarding the relative importance of qualities, what may be developed using different compositions of the qualities remains paramount. The sense of control is one of the determining factors of a stress reaction (Lupien et al., 2007). Reasonably, a sense of control is two things: an ability to choose and something to choose between. Assuming that a person in a rehabilitation setting has an ability to choose what part of the garden they want to visit, increasing variation in the garden should increase the sense of control. In a rehabilitation garden for persons with stress related mental illness, variation may therefore be considered a quality in itself. As mentioned, the qualities within the inspiring qualities are sorted by degree of challenge (Bengtsson & Grahn, 2014). Thus, the QET achieves variation and an increased sense of control to the garden user.

Variation in the QET per quality

Other than *different options in different kinds of weather*, the naming of the 19 QET qualities do not lend much attention to the quality of variation. However, the descriptors (appendix I) of each quality reveals how QET evaluates variation within certain qualities. Variation is therefore not only overarching to the tool as a whole, but also integrated within many of the 19 qualities.

The gradient of challenge in the inspiring qualities category

Because of the importance of variation and the gradient of challenge, a rehabilitation garden should have a range of different spaces. Since the 13 inspiring QET qualities are sorted by degree of challenge (Bengtsson & Grahn, 2014), the garden should strive toward having a separation in section B. Such a separation implies a variety of less demanding and more challenging areas. If this separation is weak it may need more pronunciation to create the gradient of challenge within the rehabilitation facility. Therefore, it is relevant to know between what qualities in the inspiring category this separation should ideally occur. According to Bengtsson & Grahn (2014), the garden should host a “continuum of environmental qualities,” ranging from low to high challenge. Further, Bengtsson & Grahn (2014) state that this continuum of inspiring qualities needs to be in balance with the comfortable qualities.

What is challenging?

The separation between challenging and non-challenging qualities is explicitly a gradient, in accordance with the name

gradient of challenge. However, the qualities at either end of the spectrum are distinct in their level of challenge. The distinctively challenging qualities may be regarded as:

- *joyful and meaningful activities* (B1)
- *contact with surrounding life* (B2)
- *social opportunities* (B3).

This view is based on the descriptions of Bengtsson (2015), who classifies the high challenge garden room as a place for active engagement, horticultural therapy, physical rehabilitation and social activities. Considering how the social-evaluative threat is a highly potent stressor (Dickerson & Kemeny, 2004), this distinction seems reasonable. The low challenge garden room is classified as a place for passive engagement, experiences of nature and contemplation (Bengtsson, 2015). Therefore, the distinctively non-challenging qualities may be regarded as:

- *serene* (B11)
- *wild nature* (B12)
- *refuge* (B13).

The reason for not including *seasons changing in nature* in this list is that individuals sensitive to overstimulation may be overwhelmed by seasonal changes (Ottosson, 2007).

The qualities that fall between the clearly challenging (B1-B3) and the clearly non-challenging (B11-B13) may be regarded as gray zone qualities that can be present in either a challenging or a non-challenging garden room.

Ensuring accessibility with comfortable qualities

The notion of “balance” between comfortable and inspiring qualities may be considered ambiguous in this context. The expression implies that one side should not outweigh the other. Considering the comfortable qualities, the discussed balance indicates that not all of these qualities should be present in every area of a rehabilitation garden. For example, not every space in a garden should have a greenhouse, even though it may provide a high score on *different options in different kinds of weather*. However, enough comfortable qualities need to be present in the garden to ensure accessibility to all levels of challenge in the garden for every user (Bengtsson & Grahn, 2014). In practice, a designer may aim to provide as many comfortable qualities as possible without jeopardizing the inspiring qualities of that area.

Designing based on stress theory involves the sense of control and social evaluation

As mentioned previously, lacking a sense of control and social evaluation are the two relatively more important stressors (Dickerson & Kemeny, 2004). One could therefore assume that providing the sense of control and a possibility to avoid unwanted social evaluation are two fundamental qualities of a stress reducing environment.

To provide the sense of control, at least two things are required: an ability to choose and something to choose between. In an NBR context, the ability to choose may translate to the accessibility of the garden. Accessibility in this context involves the ability to reach a physical space and stay there if wanted. The QET qualities that provide accessibility are

the comfortable qualities. The contents and diversity of the garden provides the user with something to choose between. The QET principle that provides variety is the gradient of challenge of the inspiring qualities and different combinations of these. Taken together, the QET provides comfortable qualities that ensure the ability to choose and inspiring qualities that ensure a gradient of challenge to choose from.

The possibility to avoid unwanted social evaluation is one of the cornerstone principles in the gradient of challenge, since one end of the gradient contains a high social presence, while the other end contains a social silence.

Stress theory is integrated into the QET

Based on the above argument, the QET may be viewed from a lens of providing users with a sense of control and an ability to avoid unwanted social evaluation. Therefore, the two relatively important stress response determinants are integrated into the QET. *Novelty*, a third relative stressor (figure 6), may be regarded as reflected in the QET quality *familiarity*.

Unpredictable situations, the fourth relative stress response determinant (figure 6), may be regarded as situations where the outcome did not meet the user's expectations. It seems likely that unpredictability can be dealt with in two fundamentally different ways: lowering the number of possible outcomes or raising the accuracy of predictions. Ottosson (2007) found his rehabilitation process to consist of four distinct phases, ranging from passive interaction with rocks and water, later with plants, then animals and lastly people. Interestingly, the degree of unpredictability increases in each of

Ottosson's (2007) phases: rocks and water are utterly predictable; plants change and, thus, elicit some potential unpredictability; and animals and people can be highly unpredictable. Further, the garden user may encounter unpredictable situations regarding their own interaction in the world, such as when falling, becoming sick or experiencing an accident.

In garden design, lowering the number of possible outcomes could be translated into using, for example, physical barriers to shield a user from visual, social or other events possibly happening beyond the physical barrier. For example, a person walking by outside the garden could possibly be unexpected by a garden user. By visually shielding the user from what is happening on the outside, the number of possible outcomes is reduced. In the QET, this strategy is implemented via the quality *entrance and enclosure*. Other QET qualities are relevant in terms of predictability, for example *familiarity*, *safety and security*, *serene* and *refuge*. A garden based on the integrated variation of the QET and an implementation of the gradient of challenge will therefore provide varying levels of unpredictability, catering for its user's differing needs.

Through this perspective, it seems the QET can provide varying levels of all four relative stress determinants (figure 6), by influencing the garden user's experience of

- the sense of control
- a social-evaluative threat
- novelty
- unpredictability.

Comfortable qualities

While the qualities *closeness and easy access, orientation and way finding and different options in different kinds of weather* clearly measure the possibility to reach and stay in an environment, the other comfortable qualities have a more complex character.

Enclosure and entrance is an important quality in terms of shielding an environment from external influences, such as outsiders and feelings of being exposed. Therefore, this quality is highly relevant for the gradient of challenge. It is not obvious that all areas in a garden should be enclosed, making this quality a tool to influence the degree of challenge in an area.

Safety and security contains elements of physical safety, referring to the prevention of accidents, such as risks of falling, sliding or coming in contact with toxic plants. These elements may be viewed as accessibility related, raising the user's ability to choose. However, nature often contain these risks in a manner that need not be strictly negative. Therefore, the physical safety aspect of this quality is a tool for affecting the degree of challenge in an area. Importantly, not all psychosocially challenging areas in a rehabilitation setting can be physically challenging as well.

The psycho-social elements of *safety and security*, such as *the risk of intrusion or unwillingly being viewed by outsiders*, seem to be unique among the other measurements of the QET. These elements seem negative in any context but may be unavoidable in some circumstances. Unlike the physical risks of falling or sliding, that may be a positively

challenging aspect of a natural environment, designing for these negative psycho-social risks seems unambiguously unreasonable, as they require going against the will of the user. Therefore, the descriptors of *safety and security* named *the risk of intrusion, unwillingly being viewed by outsiders, garden users intruding on those indoors and those indoors intruding on garden users* may be viewed as qualities that should be avoided if possible. Nevertheless, there may be a positive value in designing for the ability to watch over the garden users. A person in a window may be interpreted as a guardian or an intruder, depending on the user. Interestingly, the QET does not measure the positive quality of feeling watched over. In conclusion, these four intrusion-related aspects should be avoided while maintaining an awareness of the possibility for creating feelings of being watched over in a positive manner.

Familiarity is generally a difficult quality to measure because of its temporal dependency: if a novel situation is revisited it will reasonably become familiar over time. This quality may be more related to challenge and potential stressors than accessibility and comfort. This is because familiarity is the inverse of novelty, one of the stress response determinants (Lupien et al., 2007) (figure 6). *Familiarity* is, judging by its descriptors, clearly most applicable to the environment as a whole.

In summary, some aspects of the comfortable qualities are complex and could be used to alter the degree of challenge in an area to some extent. However, to ensure the accessibility of the inspiring qualities, it seems safe to strive toward maintaining a high degree of comfortable qualities in a rehabilitation garden.

Contradicting qualities

As mentioned on page 64, there seems to be mutually exclusive qualities in the QET inventory. For example, *refuge* and *serene* seem unlikely to occur simultaneously with *contact with surrounding life*. However, the results show that such combinations are possible. At Framnäs Gård (December), area I, IV, VII, IX, X, XI, XII and XIV held such seemingly contradictory qualities simultaneously. Below is an attempt to explain these contradictions:

- In area I, the *serenity* was found to be ambiguous and lacking in terms of peace, silence and being undisturbed (appendix II). The *contact with surrounding life* was also ambiguous, lacking in several of the quality's descriptors (appendix II).
- In area IV, the *serenity* was found to be ambiguous. During the analysis work for this area, no notes were taken for the descriptors, making this retrospective discussion difficult. This may demonstrate the value of using the extended QET matrix with descriptors (appendix I).
- In area VII, *refuge* and *contact with surrounding life* were found to be strong qualities simultaneously. Again, descriptor notes are lacking under the *refuge* quality, making this discussion difficult. The greenhouse in this area could clearly be seen as a *refuge*. However, entering the greenhouse would presumably affect the degree of *contact with surrounding life*. Drawing from this, it seems the spatial identification of this area could benefit from being in a

higher resolution by differentiating the greenhouse from the rest of the outdoor environment in area VII.

- In area IX, all qualities except *different options in different kinds of weather* were present to some degree. The *contact with surrounding life* here was from a relatively long distance and was filtered through the dense surrounding vegetation. The vegetation and distance filter may have allowed for the experience of *refuge* while maintaining some *contact with surrounding life*. This may be applicable to area X and XI as well.
- In area XII, all qualities except *closeness and easy access, enclosure and entrance* and *different options in different kinds of weather* were present to some degree. Because of the size of this area and the distances this creates, it seems possible to experience *refuge* here while allowing the user to walk closer to the edges to find a high degree of *contact with surrounding life*.
- In area XIV, all qualities except *different options in different kinds of weather* were found to some degree. The dense vegetation surrounding this area offered a strong protection against outsiders, while allowing the user to approach the surroundings at will. This may explain how this area could maintain these contradicting qualities simultaneously.

Finding combinations of inspiring and comfortable qualities

To use the QET as a basis for garden design, the designer must find different

combinations of inspiring and comfortable qualities for each area, creating a satisfactory and diverse whole.

There are six comfortable qualities and at least two different possibilities for each quality: either it is present, or it is not. Thus, there are $2^6 = 64$ different combinations of comfortable qualities, meaning that a garden would need 64 different areas to provide the full spectrum of variation available within the comfortable qualities.

The inspiring qualities are sorted according to a gradient of challenge (Bengtsson & Grahn, 2014). Therefore, to create a low challenge area, it seems that the high challenge qualities (B1-B3) cannot be present simultaneously with the low challenge qualities (B11-B13). In theory, some inspiring qualities seem mutually exclusive, such as *contact with surrounding life* and *refuge*. In practice, however, this is not the case. At Framnäs Gård, five different areas were found to have *contact with surrounding life* while being a *refuge* at the same time.

Drawing from this, it seems the possible combinations of inspiring qualities are chaotic. Together, the inspiring and comfortable qualities can be combined in $2^{19} = 524\,288$ different ways. Obviously, this is an unreasonable approach to designing.

Instead, the designer could create different typologies of garden areas by creating combinations based on what was found in the analysis. This process was started below, but carefully analyzing each area's weaknesses and providing accurate solutions is beyond the scope of this thesis.

Design: maintaining variation and exploring compositions

As previously discussed, the three distinctively challenging qualities may be regarded as:

- *joyful and meaningful activities* (B1)
- *contact with surrounding life* (B2)
- *social opportunities* (B3).

To maintain variation in the rehabilitation garden, it is important to create distinctively challenging areas as well as

non-challenging areas. Achieving this may be done in several ways. Below, some examples of compositions creating high and low challenge areas are presented. Motivated by the discussions on comfortable qualities on page 61, the comfortable qualities were left out of these example compositions.

An example of a non-challenging area

As Ottosson (2007) discussed, one of the least challenging areas contain rock and water and does not change hastily. Such

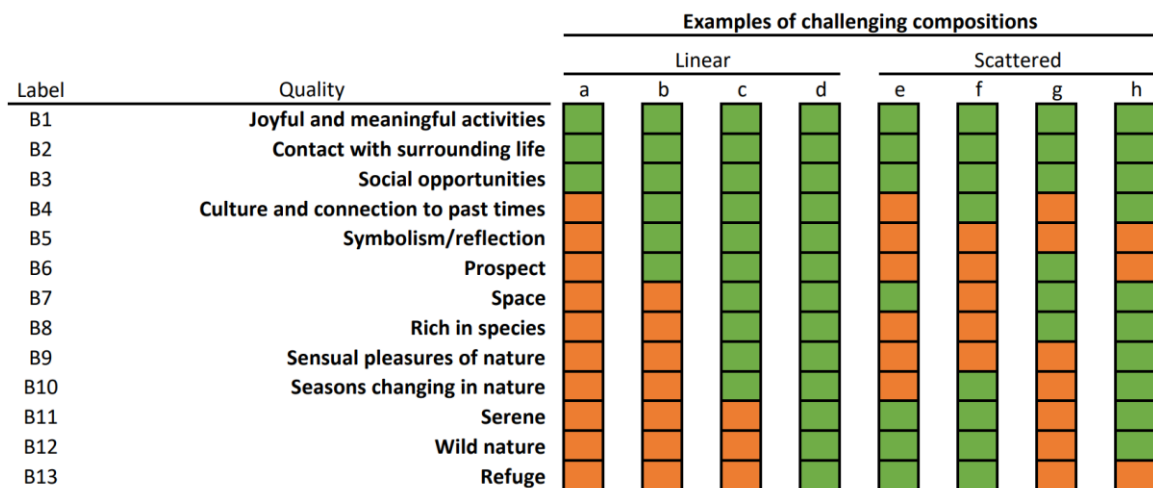


Figure 43: Examples of challenging hypothetical compositions. These examples were created as conceptual compositions and aim merely to provide a basis for discussion regarding the gradient of challenge.

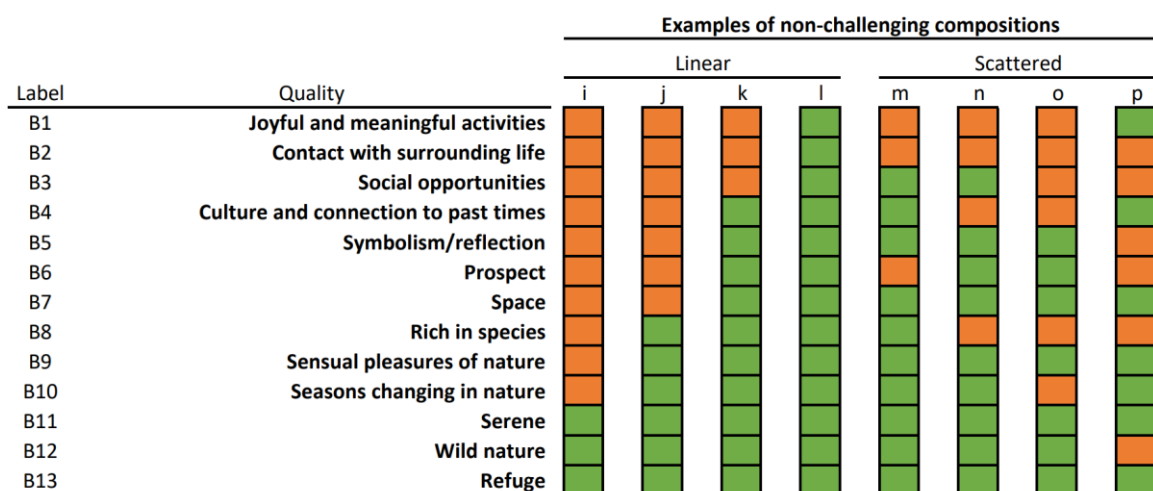


Figure 44: Examples of non-challenging hypothetical compositions. These examples were created as conceptual compositions and aim merely to provide a basis for discussion regarding the gradient of challenge.

an area could be represented by the composition example *o* (figure 44). In such an area, barely any plants are present; no people or animals are close; the seasons are almost unnoticeable; the environment is absolutely free of demands and does not care whether the user is present:

"I [the stone] have been here forever and will always be here; my entire value lies in my existence and whatever you are or do is of no concern to me" (Ottosson, 2007, p. 32).

In line with Ottosson's (2007) experiences, an area with a quality composition like example *o* (figure 44) is needed to cater for the needs of those who are highly sensitive to overstimulation. Neither Framnäs Gård nor Lyngby Skola has any area of this type. It is unclear whether their users need it specifically, but widening the spectrum of challenge in the garden is arguably pragmatic (as discussed on page 60).

Non-challenging areas can provide the option to challenge oneself

It is interesting to contemplate whether a non-challenging area could hold the three distinctively challenging qualities, as in example *l* (figure 44). This type of non-challenging area was derived from the idea that the three challenging qualities need not be experienced as such. During the analyses in this study, these three qualities (B1, B2, B3) were often found to be present when there was a possibility for *joyful and meaningful activities* or getting *contact with surrounding life* as opposed to forced activities or social presence. *Social opportunities* as a

quality does not imply forced social presence, but is merely a possibility of engaging socially at will.

Likewise, an area may offer the possibility to engage in *joyful and meaningful activities* without enforcing this behavior on the user. For example, a cobblestone beach has nothing but stones and water and could arguably be classified as a typical non-challenging environment. Still, if the user wanted to, it would be possible to engage in different joyful activities in such an environment: collecting rocks with special character, building balancing rock towers or skipping flat rocks across the water.

Further, the areas analyzed in this study often offered the possibility of getting *contact with surrounding life* at will via a semi-permeable outer border such as a woodland edge (areas IX, X and XI at Framnäs Gård, for example). These environments did not enforce *contact with surrounding life* but provided the option.

In conclusion, the three distinctively challenging qualities need not be considered as enforcing challenge. Instead, it is possible to maintain these qualities on an opportunity-basis, leaving the choice of challenging oneself to the user.

Enforced or optional challenge

Therefore, it is difficult to recommend avoiding these qualities (B1, B2, B3) if the goal is to provide low-challenge areas. What may instead be recommended for a non-challenging area is to avoid designing environments that enforce challenges on the user.

For example, short distances with little or no other barriers against the surrounding life could be considered an enforced *contact with surrounding life*.

Enforced or optional social opportunities

With the risk of entering speculative territory, an enforced version of *social opportunities* could be an environment where a user feels misplaced or awkward because they are alone there. Such interpretation could occur sitting alone at a long table or otherwise. Another enforced version of *social opportunities* might be a social presence, where the user cannot avoid feeling the presence of others. However, in such circumstances the quality could not be classified as an opportunity, since there is no option. A social opportunity may be as simple as a bench for two, but stating that such a bench is automatically demanding is questionable. Therefore, with the current naming of this quality, it is difficult to imagine a situation where *social opportunities* as a quality is strictly challenging, not merely an available option to engage socially at will.

Enforced or optional joyful and meaningful activities

Enforced *joyful and meaningful activities* may be considered a possible outcome of situations where the user feels an unwantedly strong need to engage with the environment. Animals or people may demand some attention in certain situations, making the otherwise *joyful and meaningful activities* of engaging socially or caring for an animal seem demanded of the user. Reasonably, a neglected plant or a piece of trash may also induce this need to intervene. This subjectively felt need to pay attention or intervene in an

environment may be regarded as a demand. A demanding environment is a challenging environment (Bengtsson & Grahn, 2014). Therefore, when creating a non-challenging environment, the designer needs to be ware of using elements that may induce an unwanted need of attention with the user. However, when analyzing environments using the QET, it is entirely possible to find opportunities for *joyful and meaningful activities* that are non-demanding. This is apparent when viewing the descriptors of this quality, for example:

1. stationary activities
 - relaxing
 - drinking coffee
 - reading
2. social activities
3. physical activities
4. garden activities
5. walking routes
 - contemplation
 - exercise.

Arguing for the possibility to create non-demanding *joyful and meaningful activities*, each point above will be briefly discussed here. The first point is achievable with only seating furniture in an otherwise pleasant environment. Few activities in a garden are impossible to do socially, making the second point almost redundant. All non-stationary activities are physical to some degree, making the third point easily achievable. With simple natural elements, such as plants or rocks, garden activities are automatically possible. A shrub can be pruned, stones can be stacked, and grass can be raked. Thus, the fourth point is achievable in an undemanding manner. Walking routes may be considered relatively undemanding by default, as walking is one of the simplest ways to experience natural environments.

This reasoning, that *joyful and meaningful activities* may be achieved practically automatically in natural settings, is supported by the results from Framnäs Gård, where 2/14 (December) and 3/14 (April) areas were found to not offer *joyful and meaningful activities*. Likewise, 1/12 (December) and 0/12 (April) areas at Lyngby Skola did not offer this quality.

In conclusion, it seems the availability of *joyful and meaningful activities* does not necessarily create a demanding environment. This quality is often present where there are natural elements. However, the designer needs to be wary of demanding elements such as people, animals and possible nuisances when designing for this quality if the goal is to create a low-challenge area. The QET may need additional specificity in its separation between high- and low-challenge *joyful and meaningful activities*.

The gradient of challenge is ambiguously integrated in the QET

Taken together, the three distinctively challenging qualities discussed above have nuances ranging between challenging and non-challenging. In light of this, the QET is ambiguous in its separation between challenging and non-challenging environments. Another implication of this reasoning is that an environment can hold every inspiring quality without being challenging, such as example I (figure 44).

Not all areas need joyful and meaningful activities

Of the 12 areas at Lyngby Skola (December), only area I did not hold *joyful and meaningful activities*. (In April, the quality was ambiguous in this area.) Area I

may be defined as a crossroads between other areas and an entrance to the main building. Offering activities in this area may not be favorable, since people staying in this node could become a challenging social presence for others wanting to travel between areas. Keeping this node free of psychological obstacles, such as a social-evaluative threat, lowers the threshold between the building and all other parts of the garden. Therefore, Lyngby Skola may benefit from lacking *joyful and meaningful activities* in area I.

Of the 14 areas at Framnäs Gård, only areas V and VI (December) and areas V, VI and VIII (April) were found to not hold *joyful and meaningful activities*. The main function of areas V and VI is car parking, explaining their lack of possible activities. It would be difficult to recommend any significant investment in these functional parking lots. Area VIII functions as a non-stimulating refuge, making it important for individuals sensitive to overstimulation. Therefore, increasing *joyful and meaningful activities* here seems counterproductive.

Not all areas need contact with surrounding life

At Framnäs Gård in December, 3/14 areas (II, VIII and XIII) lacked *contact with surrounding life*. In April, areas VIII and XIII lacked *contact with surrounding life*. To ensure the continued existence of non-challenging areas, the absence of these qualities should be preserved in areas II, VIII and XIII. Otherwise, the entirety of Framnäs Gård would become more monotonous and challenging. At Lyngby Skola in December, 3/12 areas (V, X and XII) lacked *contact with surrounding life*. In April, 4/12 areas (V, X, XI and XII) lacked *contact with surrounding*

life. As with Framnäs Gård, the rare absence of this quality should be preserved to maintain variation.

A beneficial use of social opportunities at Framnäs Gård

At Framnäs Gård in December, *social opportunities* were found in all areas except on the parking lots (areas V and VI) and area VIII, a lush hide-out space amongst hazel trees. It seems inconsequential that the quality is lacking on the parking lots. Drawing from the interview material with the staff (table 7), area VIII is used as a hide-out space where users can find *refuge*. This area seems to provide an important function where avoiding social presence is central. Therefore, introducing *social opportunities* here could compromise the central function of the area.

Social opportunities as a quality was often found in its non-challenging form at Framnäs Gård, together with *serene*, *wild nature* and *refuge*. (For an elaboration of how social opportunities need not be challenging, see page 68.) Therefore, this quality's near omnipresence at Framnäs Gård does not seem to be an issue.

Contradicting social qualities at Lyngby Skola

At Lyngby Skola in December, only area X lacked *social opportunities*. However, this area was found to hold a risk of psychological unpleasantness based on several factors, namely:

- risk of intrusion
- unwillingly being viewed by outsiders
- garden users intruding on those indoors
- those indoors intruding on garden users (appendix III).

Therefore, the lack of *social opportunities* in this area is inequivalent with social silence. In other words, there is a threat of social evaluation but no *social opportunities*. The area had a weak *enclosure and entrance* and lacked *contact with surrounding life*. This area's seemingly contradicting qualities makes this area interesting from a methodological perspective. How could one experience a threat of social evaluation without having *contact with surrounding life* or *social opportunities*?

Obviously, the subjective nature of the QET method has affected these results. In this case, windows along the borders of the area may be the main cause of this social-evaluative threat. These windows were located on a vantage point above the garden user, causing a reflection of the sky on the window pane. This makes it difficult to see inside, while it remains easy to see out from the window. Thus, a one-way mirror is created, enabling the garden user to feel watched without experiencing a *contact with surrounding life*. The lack of *social opportunities* in this area can be explained by a lack of seating and the risk of psychological unpleasantness. The experience of a social-evaluative threat had a subjectively discouraging effect on the will to engage socially, further lowering the presence of *social opportunities*.

Based on these findings, it seems Lyngby Skola lacks an area for escaping both *social opportunities* and the social-evaluative threat. Area II (the greenhouse) at Lyngby Skola in December was experienced to hold no risk of psychological unpleasantness in terms of:

- unwillingly being viewed by outsiders

- garden users intruding on those indoors
- those indoors intruding on garden users (appendix III).

While the risk of intrusion was left unassessed in this area (appendix III), one could argue that the area's strong *social opportunities* combined with being the only area that provides rain cover is enough to create a risk of intrusion. An area that does not hold such strong *social opportunities* may discourage others from entering, lowering the risk of intrusion.

Drawing from these discussions, it seems reasonable to recommend a place of social silence to Lyngby Skola. An area of social silence does not hold strong *social opportunities*, has no risk of intrusion or being viewed and no *contact with surrounding life* in terms of other people. This composition of socially relevant qualities can be found in area VIII at Framnäs Gård (appendix II) and is similar to the quality composition of example o (figure 44).

Different options in different kinds of weather was the most lacking quality

Taking together the results from both Framnäs Gård and Lyngby Skola, 26 individual areas were analyzed with the QET both in December and in April. *Different options in different kinds of weather* was the rarest quality of all 19 qualities, being unambiguously found in 2/26 areas in December (VII at Framnäs Gård; II at Lyngby Skola). In April, the quality was unambiguously found in 3/26 areas (IV and VII at Framnäs Gård; II at Lyngby Skola). Both area VII at Framnäs Gård and II at Lyngby Skola had a greenhouse. Area IV at Framnäs Gård has a sheet

metal roof that may be used as rain protection. Otherwise, the greenhouses were the sole option (except going inside) in both rehabilitation gardens that offered protection from rain.

Since these facilities are dealing with nature-based rehabilitation, going inside should be a last resort. Both facilities operate year-round, making rain a likely occurrence over the course of a participant's time there. Therefore, providing an option to be outside despite rain is a fundamental accessibility factor in the garden. Without such options, the garden may only be used comfortably in a non-challenging manner on dry days. It is obvious how important this quality is in a climate like Sweden's, yet only one or two areas offer it in each facility.

The most obvious recommendation that can be made from the analysis work in this thesis is to provide more options for being outside in different kinds of weather.

In particular, rain cover should be prioritized, as this element of was found unambiguously in only one or two areas in both facilities (appendices II, III, IV and V). *Different options in different kinds of weather* was found to be weak or ambiguous in 9/26 of the studied areas in December. In April, the quality was weak or ambiguous in 12/26 areas. In most of those areas, rain cover was the lacking element (appendices II, III, IV and V). Not every area in a rehabilitation garden can have a greenhouse. Therefore, developing the studied rehabilitation gardens based on the results of this study involves finding different solutions to provide rain cover.

Wild nature at Lyngby Skola

At Lyngby Skola (both December and April), *wild nature* was not found unambiguously in any of its 12 areas. However, as became apparent in the staff interviews there (appendix VII), *wild nature* is found outside the property of Lyngby Skola. Every Wednesday, the staff and participants go to a nearby nature reserve (appendix VII). Since the participants generally do not go alone, cannot easily walk there and go there on a scheduled basis, the accessibility of this *wild nature* is questionable:

- Being a field trip with others, there is a threshold consisting of social engagement to accessing *wild nature* at this facility.
- To access *wild nature*, the participant must walk at least 1 km. Therefore, the accessibility of this area is fundamentally poor.
- Only accessing this quality on a scheduled basis may infringe on the participants sense of freedom.

Since this area is at a distance from Lyngby Skola, the analysis was never conducted there. Thus, the other qualities of this area are unexplored in this thesis. Even if the area is of high quality, the issue of accessibility would remain. *Wild nature* is one of the least challenging qualities and may be needed during the recovery of an individual sensitive to overstimulation. Such an individual cannot be assumed to need the additional challenge of having to walk a relatively long distance before reaching this non-challenging quality. Therefore, one possible recommendation to Lyngby Skola

would be to establish an easily accessible area with *wild nature*.

Creating such an area could reasonably be done with a target quality composition similar to examples *l*, *m*, *n* or *o* (figure 44). *Wild nature* is especially important for individuals that need highly supporting, non-challenging environments (Bengtsson & Grahn, 2014). Therefore, the comfortable qualities of this new *wild nature* area should be as strong as possible without infringing on the inspiring qualities, making the area highly accessible.

Safety and security in relation to enclosure

Proportionally, the most ambiguous quality within a facility was found to be *safety and security* at Framnäs Gård in December or *different options in different kinds of weather* at Framnäs Gård in April.⁶ At first, weak or ambiguous qualities may appear to represent low-effort, high-yield opportunities. However, viewing the detailed notes from the extended list of descriptors (appendix II) shows that the ambiguity of *safety and security* at Framnäs Gård in December is primarily due to the risk of psychological unpleasantness. In turn, this risk often concerns a kind of intrusion risk (Bengtsson & Grahn, 2014). The risk of intrusion is a complex property of the environment and may not be particularly simple to change.

Without immediately assuming causation, there is a certain correlation between weak *safety and security* and weak *enclosure and entrance*. Of all areas analyzed in December in this study, 10 out of

⁶ As noted on page 79, much of the ambiguity concerning this quality is due to a lack of rain cover.

the 15 areas with lacking or ambiguous *safety and security* also lack in *enclosure and entrance* (table 3 and 5). This was also true for 8/12 areas in the April analysis (table 4 and 6). Lacking enclosure may reasonably affect the risk of intrusion.

Partially enclosed spaces creating safety and security

Based on the categories of intrusion mentioned by Bengtsson & Grahn (2014), a simple form of intrusion may be regarded as an unwanted visual connection. An enclosure reduces the risk of unwanted visual connections, but may increase the risk of someone accidentally entering an occupied space. In turn, such accidental physical intrusions may be prevented with design that allows occupancy to be announced before a physical intrusion occurs. For example, a non-opaque enclosure, such as vegetation or a well-designed wooden fence, may protect against visual intrusion while providing visual information concerning occu-

pancy. Based on these discussions, a possible recommendation for increasing *safety and security* is to develop at least partly enclosed spaces within the areas in question (areas with high risk of intrusion, weak *safety and security* and weak *enclosure and entrance*). Such interventions need not be substantial and can be combined with solutions for providing wind protection, rain cover and/or *different options in different kinds of weather*. For reference, see figure 45.



Figure 45: An example of a corner enclosure that may protect against visual intrusion while providing visual information concerning occupancy. This space is in a residential yard. The seating furniture is possibly unsuitable for a rehabilitation setting.

Approaching 19 strong QET qualities in two areas at Framnäs Gård

Areas X and XI at Framnäs Gård in December were found to hold all qualities to some extent. Area XI lacks only in comfortable qualities, having ambiguous *enclosure and entrance*, *safety and security* and *different options in different kinds of weather*. Based on its many inspiring qualities, this area may be regarded as a highly valuable space within Framnäs Gård. Investing here seems warranted. Interestingly, the owners of Framnäs Gård has already started investing in the bordering area X, where they are currently building a greenhouse. This greenhouse will address area X's lack in *different options in different kinds of weather*. Presumably, not both areas need a greenhouse. Instead, it seems reasonable to suggest that the added greenhouse in area X will positively affect area XI as well.

Increasing *safety and security* as well as *enclosure and entrance* within area XI may be favorable, since such an inspiring space benefits from being highly comfortable. A physical structure for increasing these two comfortable qualities was suggested above, on page 72. The reasons behind the weak *safety and security* of area XI in December were found to be weaknesses in terms of:

- risk of falling
- ground cover
- distance between benches
- risk of intrusion
- unwillingly being viewed by outsiders
- garden users intruding on those indoors
- those indoors intruding on garden users (appendix II).

Note that these findings are subjective, and a user or staff member of the rehabilitation garden may not agree on these findings.

These issues may be addressed by, for example, creating a corner space in connection with the red tool shed that is currently there (table 8). A simple wooden fence or trellis with wood-friendly climbers (without suction cups) such as *Clematis* or *Wisteria* may favorably be used to create a pleasant space, preferably enveloping comfortable seating. The seating would address the issue of distance between benches in this area. The climber breaks the hard shapes of the wooden structures, provides a calm atmosphere and *sensual pleasures of nature*. This corner could face south, creating a warm and protected space. Seating furniture in close connection to a fragrant *Wisteria frutescens* "Amethyst Falls" is suitable. The lilac and green of this dwarf climber softens the color palette of this space. Following this recommendation would address the issues of *safety and security* and *enclosure and entrance*, while the greenhouse in area X lends some positive effect on *different options in different kinds of weather* in this neighboring area.

Conclusions

The QET landscape analysis is a powerful and versatile tool. With the help of the list of descriptors (appendix I) the tool becomes more readily available to the first-time user. Here, general conclusions concerning the QET and the evaluation work in this thesis are listed:

- Using two cases as a basis for evaluating the QET analysis phase (step 1) seems sufficient. The bi-seasonal analysis was also pragmatic for this purpose.
- The QET is necessarily subjective.
- Artifacts in the data caused by temporary conditions may be unavoidable in this sample size.
- Descriptor notes are important during retrospective discussions and provide a detailed and accessible design basis.
- Interviews and observation provide essential information both for evaluating the QET and for design purposes.
- A low resolution in the spatial identification may lead to contradicting results.
- The scale on which to map the presence of qualities is not predetermined, but must be adapted to the aim of the study.

There are several issues to be discussed among the QET qualities. Below, conclusions concerning the QET qualities are listed:

- The QET is ambiguous in its separation between challenging and non-challenging environments.
- The three distinctively challenging qualities need not be considered as enforcing challenge. Instead, it is possible to maintain

these qualities on an opportunity-basis, leaving the choice of challenging oneself to the user.

- An environment can hold every inspiring quality without being challenging.
- An environment can hold several seemingly contradictory qualities simultaneously.
- Some additional attention is warranted toward qualities that contain social-evaluative threats or elicit a sense of lacking control because of these factors' relative stress significance.
- By implementing the gradient of challenge skillfully, the QET user may achieve variation and an increased sense of control to the garden user.
- *Joyful and meaningful activities* may be achieved practically automatically in natural settings. The QET may need additional specificity in its separation between high- and low-challenge joyful and meaningful activities.
- Providing the sense of control and a possibility to avoid unwanted social evaluation seems to be two fundamental qualities of a stress reducing environment.
- Some aspects of the comfortable qualities are complex and could be used to alter the degree of challenge in an area to some extent. However, to ensure the accessibility of the inspiring qualities, it seems safe to strive toward maintaining a high degree of comfortable qualities in a rehabilitation garden.

Sources of error

The most obvious source of error in this work is the subjectivity of the QET. For the purpose of completing a case study to evaluate the QET, the subjectivity within the QET means that the evaluation is partly based on subjective data. For the purpose of enhancing an environment, the subjectivity of the QET means that the enhancements are based on subjective data. This subjectivity is necessary to evaluate relevant qualities, such as *safety and security*. The interview phase of the QET (step 2) anchors the findings from the landscape analysis (step 1) to the environment's staff and users, somewhat reducing the risk of providing low quality recommendations in the final phase of the QET (step 3).

Temporary conditions of both the tool user and the target environment may have a significant effect on the results. In this study, the temporary conditions that probably affected the results include (but are not limited to):

- The tool user's mental and physical state during the day of analysis
 - During the April visit to Lyngby Skola, the tool user was sleep deprived and mentally weakened as a result.
 - During the December visit to Framnäs Gård, the tool user failed to bring adequate clothing.
- Site specific conditions during the day of analysis
 - Due to the wind direction during the April landscape analysis at Lyngby Skola, many of the south western areas were negatively af-

ected in their level of *serenity*. This may explain why area VII, for instance, was found to provide ten strong qualities during the April analysis but 16 strong qualities during the December analysis.

- During both visits at Lyngby Skola, participants were present during the analysis. In contrast, no analysis at Framnäs Gård was done with participants present.
- During both visits at Framnäs Gård, some light construction work was in process.

Confirmation bias

In this study, the December analysis was done before the April analysis. Therefore, discussions and thoughts emerging from the study's results were initially based solely on the December analysis. Thus, these results had a longer period of possible influence, creating a bias. In addition, the method was more familiar during the April analysis, possibly affecting the results. Also, the results of the December analysis were known during the April analysis, potentially creating a confirmation bias. The impact of this bias is unclear but may be presumed to have favored a confirmation of the December analysis' results.

Implications

Here, the implications of the evaluation of the QET are presented briefly. The recommendations provided after this section may be considered the design implications of this work.

Future QET users applying this tool in a stress rehabilitation garden context may want to consider

- using the list of descriptors developed in this thesis to support their landscape analysis work
- using at least a 0-2 scale when evaluating the presence of QET qualities, where 0 = not present, 1 = ambiguous/weak and 2 = strong presence
- the nuances of what is challenging and not
- keeping the stress response determinants in mind when working with the landscape analysis, to ensure noting stress relevant aspects (figure 6).

Recommendations

To both facilities

It is difficult to recommend avoiding the challenging qualities (B1, B2, B3) if the goal is to provide diverse low-challenge areas. What may instead be recommended for a non-challenging area is to avoid designing environments that enforce challenges on the user. (See page 67 for a motivation.)

Provide more options for being outside in different kinds of weather, especially rain cover. (See page 71 for a motivation.)

A possible recommendation for increasing *safety and security* is to develop at least partly enclosed spaces within areas with high risk of intrusion, weak *safety and security* and weak *enclosure and entrance*. Such interventions need not be substantial and can be combined with solutions for providing wind protection, rain cover and/or *different options in different kinds of weather*. For reference, see figure 45. (See page 74 for a motivation.)

The rare absence of *contact with surrounding life* should be preserved to maintain variation. (See page 69 for a motivation.)

To Lyngby Skola

It seems reasonable to recommend a place of social silence to Lyngby Skola. An area of social silence does not hold strong *social opportunities*, has no risk of intrusion or being viewed and no *contact with surrounding life* in terms of other people. This composition of socially relevant qualities can be found in area VIII at Framnäs Gård (appendix II) and is similar to the quality composition of example o (figure 44). (See page 70 for a motivation.)

A possible recommendation to Lyngby Skola would be to establish an easily accessible area with *wild nature*. The comfortable qualities of this new *wild nature* area should be as strong as possible without infringing on the inspiring qualities, making the area highly accessible. (See page 72 for a motivation.)

The large tree stump in area IV and the large stone in area V at Lyngby Skola could be lowered slightly into the ground. This simple intervention would give the illusion that they have been

there for a long time, enhancing the areas' *symbolism/reflection* quality.

Lyngby Skola may benefit from lacking *joyful and meaningful activities* in area I. (See page 69 for a motivation.)

To Framnäs Gård

Increasing *joyful and meaningful activities* in areas V, VI and VIII seems counter-productive. (See page 69 for a motivation.)

Develop a corner space in connection with the red tool shed in area XI. A simple wooden fence or trellis with wood-friendly climbers (without suction cups) such as *Clematis* or *Wisteria* may favorably be used to create a pleasant space, preferably enveloping comfortable seating. The seating would address the issue of distance between benches in this area. The climber breaks the hard shapes of the wooden structures, provides a calm atmosphere and *sensual pleasures of nature*. This corner could face south, creating a warm and protected space. Seating furniture in close connection to a fragrant *Wisteria frutescens* "Amethyst Falls" is suitable. (See page 75 for a motivation.)

Social opportunity's near omnipresence at Framnäs Gård does not seem to be an issue. (See page 70 for a motivation.)

Introducing social opportunities in area VIII could compromise the central function of the area. (See page 70 for a motivation.)

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Appendices

Appendix I: QET Matrix Blank

		Quality prevalence (0-2) in area							Quality	Descriptor(s)
Cat.	Q#									
A	1								Closeness and easy access	
										physically close to
										visible
										easily accessible
	2								Enclosure and entrance	doors/thresholds /locking devices
										enclosure corresponds to needs of safety and security
										not confined
	3								Safety and security	distinct entrance
										disguised gates
										no risk physical unpleasantness
										falling
										sliding
										toxic plants
										falling into water
										ground cover
										width
										surface
										gradient
										edges
										distance benches
										availability handrails
										no risk psychological unpleasantness
										risk of intrusion
										unwillingly being viewed by outsiders
										garden users intruding on those indoors
										those indoors intruding on garden users
										ambiguous design
										soft shapes
										soft colors
										green
										lilac
										blue
										white
										hard angular shapes
										intense colors
										red
										orange
										yellow
										natural sounds
										manmade sounds
	4								Familiarity	
										outdoor environment is a natural part of the setting
										easy to familiarize with outdoor environment
										different parts are connected to a whole
	5								Orientation and way finding	familiar
										garden features
										plants
										activities
										people
										distribution and design of
										paths
										places
										landmarks
										doorway back to building
										nodes
										edges
										dead ends
										distinct places along paths
										boundaries between private and public
										balance of complexity and unity

		Quality prevalence (0-2) in area								
Cat.	Q#								Quality	Descriptor(s)
B	6								Different options in different kinds of weather	paths and places offer variation
										sun
										shade
										wind protection
										rain cover
										dry benches**
	1								Joyful and meaningful activities	corresponding with user needs/wishes
										stationary activities
										relaxing
										drinking coffee
										reading
										social activities
										physical activities
										therapy activities
										garden activities
										walking routes
										contemplation
										exercise
										children visitors
	2								Contact with surrounding life	possible to engage with
										moving things
										changing things
										pets
										people
										traffic
	3								Social opportunities	community
										viewing surroundings from different places
										paths connecting with surroundings
										places for amusement and pleasure
										meeting places
										watching others
										plants and things to discuss
										outdoor tables and chairs for informal meetings
										meeting places
	4								Culture and connection to past times	for many people
										users and visitors to be together by themselves
										possibility to interact with people from outside healthcare setting
	5								Symbolism/reflection	places offer fascination with human culture
										signs of peoples values and toil
										memory-stimulating
										clothesline
										hand pump
										barbecue
										design and content
										special character
										meaning
										something to be proud of
										elements provoking thoughts about relation between one's life and nature
										moss-covered stone
										other symbols of time**
										nature's power of transformation
										aggressive spring greenery
										winter**
										autumn**
										summer**

Quality prevalence (0-2) in area									
Cat.	Q#							Quality	Descriptor(s)
	6							Prospect	
									inviting green open spaces
									views of well-managed
									nature
									plants
	7							Space	
									areas offering restful feeling of entering another world
									coherent whole
	8							Rich in species	
									variety of species
									animals
									plants
	9							Sensual pleasures of nature	
									opportunities to experience nature by
									seeing
									feeling
									hearing
									smelling
									tasting
									opportunities to experience
									vegetation
									flowers
									fruits
									animals
									insects
									sun
									sky
									wind
									water
									dawn
									dusk
	10							Seasons changing in nature	
									follow seasonal changes in
									plants
									experiences
									activities
	11							Serene	
									undisturbed
									not crowded
									well maintained
									calming elements
									water
									water sounds
									greenery
									relaxation
									peace
									silence
	12							Wild nature	
									experience nature on its own terms
									plants seem to grow wild
									appearance of development without human influence
	13							Refuge	
									enclosed
									secluded
									lush
									offering activities such as
									tinkering
									playing
									being alone
									private discussions
									sit and watch people from a distance
									staff-only places
									two paths leading to the refuge
									possibility to escape

Note. The descriptors listed were extracted from a study describing the QET method (Bengtsson & Grahn, 2014). This procedure was not done to achieve legitimacy, but to provide support in the fieldwork. To complement these descriptors, simple additions were made where examples were lacking. Double Asterix (**) = additional descriptor not found in foundational study (Bengtsson & Grahn, 2014).

Appendix II: QET Matrix Raw Results Framnäs (December)

		Quality prevalence (0-2) in area														Quality	Descriptor(s)
Cat.	Q#	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV		
A	1	S	S	S	S	S	S	S	W	W	S	S	-	-	W	Closeness and easy access	
		S	S						S	W	W	S	-	S	W		physically close to
		S	S						W	-	S	S	S	W	W		visible
		S	S						-	S	W	S	W	-	S		easily accessible
	2	-	W										S			Enclosure and entrance	doors/thresholds*/locking devices
		S	W	W	S	S	S	W	S	S	W	W	-	W	S		enclosure corresponds to needs of safety and security
		S	S										-		S		not confined
		S	W				S						S	-	S		distinct entrance
	3	-	-													Safety and security	disguised gates*
		S	W	W	W	-	-	W	W	S	W	W	W	-	S		no risk physical unpleasantness
		-	-						-	W		W	-	-	W		falling
		W	W						S			S	S	S	S		sliding
		W	W						S					S	S		toxic plants
		-	-										W				falling into water
		W	S						-		-	W	-	-			ground cover
		W	S														width
		W	W														sufrace
		W	S											S			gradient
		W	S														edges
		S	S						-		S	W	-	-			distance benches
		-	-						-								availability handrails*
		-	-			-	-		W	S	W	W	-		S		no risk psychological unpleasantness
		S	S			S	S	S	W	-	S	W	S	S	-		risk of intrusion
		-	-		-		S	S	-	W		W	S	-	W		unwillingly being viewed by outsiders
		-	S			S	S	S	-	-	W	W	-	-	-		garden users intruding on those indoors
		S	S		W	S	S	S	-	-	S	S	S	-	-		those indoors intruding on garden users
		-	-						-	-	-	-	-	-	-		ambiguous design
		W	W						S	S	S		S	S	S		soft shapes
		S	S						S	S	S		S	S	S		soft colors
		S	S								S						green
		S	S														lilac
		W	W														blue
		-	W														white
		W	S			S			-		S						hard angular shapes
		-	-														intense colors
		-	-														red
		-	-														orange
		W	-														yellow
		S	W					S	S	S			S		S		natural sounds
		S	S	S				S	S	S	W		S		S		manmade sounds
	4	S	S	S	S	S	S	S	S	S	S	S	S	S	S	Familiarity	
		S	S								S	S	S	S	S		outdoor environment is a natural part of the setting
		S	S									S	S		S		easy to familiarize with outdoor environment
		S	S									S	S		S		different parts are connected to a whole
		S	S									S	S		S		familiar
		S	S									S	S		S		garden features
		S	S									S	S		S		plants
		S	S									S	S		S		activities
	5	S	S	S	S	S	W	S	-	S	S	S	S	W	S	Orientation and way finding	people
																	distribution and design of
		S	-							S			-	-	S		paths
		S	-							S			S		S		places
		S	S							S			S	S	S		landmarks
		S	S												-		doorway back to building
		S	S							S					-		nodes
		S	S							S				S	S		edges
		-	-							-			-	S	-		dead ends
		S	S							S					S		distinct places along paths
		S	S			W							S				boundaries between private and public
		S	S							S							balance of complexity and unity

Quality prevalence (0-2) in area																Quality	Descriptor(s)	
Cat.	Q#	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV			
A	6	W	-	-	W	-	-	S	W	-	W	W	-	-	-	Different options in different kinds of weather		
		W	-							-	W	W	-	-	-		paths and places offer variation	
		S	S						W	-	-	W	S	S	-		sun	
		S	S						S	S	S	S	S	-	S		shade	
		S	S						S	S	S	S	S	-	S		wind protection	
		-	-						S	W	-		-	-	-		rain cover	
		-	-						S	-	-		-	-	-		dry benches**	
	B	1	S	S	W	S	-	-	S	W	S	S	S	S	W	S	Joyful and meaningful activities	
			S	S							S	S				S		corresponding with user needs/wishes
			W	-						S		S	S	-	S			stationary activities
			W	-						S	S	S	S		S	S		relaxing
			W	-							S	S						drinking coffee
			-	-							S	S			S			reading
			S	W						-	S	S	S	S	-	S		social activities
S			S						-	S	S	S	S	S	W	S		physical activities
S			S						W	S	S	S	S	-	S			therapy activities
S			S							S	S	S	S	-	S			garden activities
S			S						W	S	S	S	S	W	S			walking routes
S			S							S	S	S	S		S			contemplation
S			S							S	S	S	S	S	S	S		exercise
-			S							S	S	S	S		S			children visitors*
C	2	W	-	S	S	S	S	S	-	S	S	S	S	-	S	Contact with surrounding life		
		W		S							S	S		S			possible to engage with	
		S	S								S	S		S			moving things	
		S		S							S	S		S			changing things	
		-									-	-	-	-			pets	
		-									-	S		S			people	
		-									S	S		S			traffic	
	W		S							-	S		S		community			
	W		S							S	W		S		viewing surroundings from different places			
	S									S	S		S		paths connecting with surroundings			
	3	S	W	S	W	-	-	S	-	W	S	S	S	W	W	Social opportunities		
		S									S	S	S		S		places for amusement and pleasure	
		S									S	S	S	S	-		meeting places	
		S									S	S	S	S	S		watching others	
S			S							S	S	S		S	plants and things to discuss			
-			W						-	W	W	-	-	-	outdoor tables and chairs for informal meetings			
S										S	S	S	-	-	meeting places			
S									S	W	S	-	-	for many people				
W									S	S	S		S	users and visitors to be together by themselves				
-									-	-	S		S	possibility to interact with people from outside healthcare...				
D	4	S	S	S	S	S	S	S	-	W	W	S	S	-	S	Culture and connection to past times		
		S									-	S	S		S		places offer fascination with human culture	
		S								W	-	S	S	-	-		signs of peoples values and toil	
		S								S		S	S		S		memory-stimulating	
		-										S					clothesline	
		-															hand pump	
		-															barbecue	
	S									W	S	S		S	design and content			
	S									S	S	S		S	special character			
	S										S	S		S	meaning			
	S											S	S		S	something to be proud of		
	5	S	S	S	S	-	S	S	S	S	S	S	S	S	S	Symbolism/reflection		
		S									S	S	S	S			elements provoking thoughts about relation between...	
		-															moss-covered stone	
S										S	S				other symbols of time**			
S										S	S	S	S		nature's power of transformation			
W															aggressive spring greenery			
-															winter**			
S														autumn**				
S														summer**				

Quality prevalence (0-2) in area															Quality	Descriptor(s)	
Cat.	Q#	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV		
6		S	W	S	S	S	S	S	-	W	W	S	S	-	S	Prospect	
		S										S	S		-		inviting green open spaces
		S										S	S		S		views of well-managed
		S										S	S		S		nature plants
7		S	S	S	W	S	S	W	S	S	S	S	S	S	S	Space	
		S										S	S	S			S
8		S	W	-	W	-	W	S	W	S	S	S	S	S	S	Rich in species	
		S									S	S	-		S		variety of species
		-			S						W	S	-	-	W		animals
		S										S	S	S	S		plants
9		S	S	-	W	-	-	S	S	S	S	S	S	W	S	Sensual pleasures of nature	
		S			W							S	S		S		opportunities to experience nature by
		S				-		S	S			S	S	S	S		seeing
		S		S	S			S	S			S	S	S	-		feeling
		S			S			S	S			S	S	S	S		hearing
		S			S			S	S			S	S	S	S		smelling
		S				S						-	-	S	-		tasting
		S										S	S	S			opportunities to experience
		S		S				S	S			S	S	S	S		vegetation
		S						S	S			S	S	S	S		flowers
		S										-	-	S	-		fruits
		S		S	S			S	W			S	S	-	-		animals
		S						S	S			S	S	S	S		insects
		S						W	-			S	S	S	W		sun
		W		W				S	-			S	S	S	W		sky
		-		S				S	-			-	S	S	W		wind
		-						-	-			-	W	S	S		water
		W						S	-			-	S	S	-		dawn
		S		S				-				S	S	S	S		dusk
10		S	S	W	W	W	W	S	S	S	S	S	S	S	S	Seasons changing in nature	
		S										S	S	S			follow seasonal changes in
		S										S	S	S	S		plants
		S										S	S	S			experiences
		S										S	W	S	-		activities
11		W	-	-	W	-	-	-	S	W	W	S	S	S	S	Serene	
		W							W	S	W	S	W	S	S		undisturbed
		S										S	S	S	S		not crowded
		S										S	S	S	W		well maintained
		S							S						S		calming elements
		-											W	S	S		water
		-											-	-	-		water sounds
		S							S	S	S	S	S	S	S		greenery
		S							S	S	S	S	S	S	S		relaxation
		W							S	S	S	S	S	S	S		peace
12		W								W	S	W	S	S	S	Wild nature	
		-	-	-	-	-	-	W	S	S	S	S	W	S	S		experience nature on its own terms
		-							S			S	S	W	S		plants seem to grow wild
		-							S			-	S	W	S		appearance of development without human influence
13		-	-	-	S	-	-	S	S	S	W	S	S	S	S	Refuge	
		S							S			-	-	S	S		enclosed
		-							S			S	S	S	S		secluded
		W							S			S	W	S	S		lush
		W											S	S	S		offering activities such as
		S							S			S	S	S	S		tinkering
		-							S			S	-	S	S		playing
		W							S			S	S	S	S		being alone
		-							S			S	S	S	S		private discussions
		S							W			S	-	S	W		sit and watch people from a distance
		-															staff-only places
		S							S				S		S		two paths leading to the refuge
		S							S				S		S		possibility to escape

Note. Blank fields indicate not assessed. Rows such as *risk of intrusion* were often marked as true (S), indicating that there is indeed a risk of psychological unpleasantness. Therefore, a green (S) field may not be read as a positive answer. A dashed (-) field of the row *distance benches* indicates long distances between benches. S = strong/true; W = weak/ambiguous; dash (-) = absent/false.

Appendix III: QET Matrix Raw Results Lyngby (December)

		Quality prevalence (0-2) in area												Quality	Descriptor(s)
Cat.	Q#	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII		
A	1	S	S	S	S	S	S	S	S	-	W	S	S	Closeness and easy access	
						S			S	W	W				physically close to
						S			S	-	-				visible
						S			S	W	S				easily accessible
						S			-	-	-				doors/thresholds*/locking devices
	2	W	S	-	S	S	W	S	W	S	W	W	S	Enclosure and entrance	
															enclosure corresponds to needs of safety and security
												-	W		not confined
			S	W											distinct entrance
						S									disguised gates*
	3	S	S	W	S	S	S	S	W	S	W	S	W	Safety and security	
			S			W							S		no risk physical unpleasantness
				S		W			S						falling
				S		W			S						sliding
									-						toxic plants
						W			-						falling into water
									-						ground cover
						S									width
						S									suface
						S									gradient
															edges
						S	S	S	S						distance benches
															availability handrails*
		-	S				W	-	-	-	-	-	-		no risk psychological unpleasantness
		S				S	W	S		S	S	W	S		risk of intrusion
			-			-	-	-	S		S	S	S		unwillingly being viewed by outsiders
			-			W	-	S	W		S	-	S		garden users intruding on those indoors
			-			W	-	S	S		S		S		those indoors intruding on garden users
								S		S			S		ambiguous design
						S	-	S			S	S	S		soft shapes
															soft colors
								S							green
								S							lilac
								S							blue
															white
						S	S	S	S				S		hard angular shapes
															intense colors
															red
															orange
															yellow
						S		S	S				S		natural sounds
						S		W	S						manmade sounds
	4	S	S	W	S	S	S	S	W	S	S	S	S	Familiarity	
								S							outdoor environment is a natural part of the setting
									S						easy to familiarize with outdoor environment
															different parts are connected to a whole
												S			familiar
															garden features
															plants
															activities
															people
											-				
	5	S	S	W	S	W	S	S	S	W	S	S	W	Orientation and way finding	
															distribution and design of
															paths
															places
				S											landmarks
				S											doorway back to building
															nodes
									S	-					edges
									S						dead ends
									-	S	-	W	-		distinct places along paths
									-	-	-				boundaries between private and public
									S						balance of complexity and unity

Quality prevalence (0-2) in area																	
Cat.	Q#	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Quality	Descriptor(s)		
	6	W	S	-	W	W	-	W	-	-	-	-	-	-	Different options in different kinds of weather		
					W	W		W	-							paths and places offer variation	
		S	S		W	S		S	S	-			S	S		sun	
		S	S		S	S	-	W	-	S			S	S		shade	
		S	S	-	S	S	-	S	-	-			W	S		wind protection	
		-	S	W	-	-	-	-	-				-	-		rain cover	
		-	S		W	W		-					-	-		dry benches**	
		-	S	W	W	S	S	S	S	S	W	W	S	S			
																	corresponding with user needs/wishes
					S	S			S	S				S		S	stationary activities
	1			S	S			S	S				S	S	Joyful and meaningful activities	relaxing	
				S	S			S	S				S			drinking coffee	
				S				S	S				S			reading	
								S	S								
			S	S	S			S	S	S		S	S	S		social activities	
			S	-	-			S	-	S	S	S	S	S		physical activities	
			S	S	S			S	S	S		S	S	S		therapy activities	
			S	S	S			S	S	S		S	S	S		garden activities	
		S	S	-						S	S	S	S	S		walking routes	
										S						contemplation	
	2								S						Contact with surrounding life	exercise	
													S			children visitors*	
		W	S	S	S	-	S	W	S	S	-	W	-	-			
									S	S						possible to engage with	
									S	S						moving things	
										S	S					changing things	
									-	W						pets	
									-	-	S					people	
																traffic	
										S						community	
	3								S	S					Social opportunities	viewing surroundings from different places	
									-	S						paths connecting with surroundings	
		W	S	S	W	S	S	S	S	S	-	S	W				
										S						places for amusement and pleasure	
										S						meeting places	
										S						watching others	
		S		S					S	S						plants and things to discuss	
		-			S				S							outdoor tables and chairs for informal meetings	
		W								S						meeting places	
		-			-			-	S							for many people	
	4				S				S	S					Culture and connection to past times	users and visitors to be together by themselves	
					S				S	S						possibility to interact with people from outside healthcare...	
		S	S	S	W	W	S	S	S	S	W	W	S				
			S	S		W		S	S							places offer fascination with human culture	
			S	S	S	W		S	S							signs of peoples values and toil	
								S	S							memory-stimulating	
																clothesline	
																hand pump	
		S														barbecue	
			S	S		S		S	S	S				S		design and content	
	5		S	S	S		S		S	S	W	W	-	S	Symbolism/reflection	special character	
																meaning	
																something to be proud of	
		S	S	S	W	W	S	S	S	W	W	-	S				
				S										S		elements provoking thoughts about relation between...	
				S										S		moss-covered stone	
				S	S	S										other symbols of time**	
																nature's power of transformation	
																aggressive spring greenery	
																winter**	
															autumn**		
															summer**		

Quality prevalence (0-2) in area													Quality	Descriptor(s)	
Cat.	Q#	I	II	III	IV	V	VI	VII	VIII	IX	X	XI			XII
6		W	S	S	W	-	S	S	S	S	-	W	-	Prospect	inviting green open spaces
								W	S						views of well-managed
								S	S						nature
								S	S						plants
7		-	S	W	W	S	-	S	S	S	W	S	S	Space	areas offering restful feeling of entering another world
			S										S		coherent whole
8		S	S	-	S	S	S	S	S	W	S	W	S	Rich in species	variety of species
			-					W		W			-		animals
9		S						S		W	S		S	plants	
		W	S	S	S	W	S	S	W	S	S	S	S	Sensual pleasures of nature	
														opportunities to experience nature by	
		S	S					S	S	S			S	seeing	
		S	S	S				S		S	S		S	feeling	
			S	S				S	S	S				hearing	
			S	S				S	W	S	S	S	S	smelling	
			S					S	W	-			S	tasting	
									S					opportunities to experience	
			S					S	S	S	S	S	S	vegetation	
			S					S	S				S	flowers	
			S					S	W					fruits	
			W	S				S	S				-	animals	
				S				S	S				S	insects	
				S				S	S				S	sun	
			S	S				S	S				S	sky	
			S	S				S	S				S	wind	
		10		W						-	-		-	-	-
								S	S					dawn	
								S	S					dusk	
S	S			S	S	S	S	S	S	-	S	S	S	Seasons changing in nature	
								S						follow seasonal changes in	
								S						plants	
								S						experiences	
								S						activities	
-	S			-	W	W	W	S	W	S	-	W	W	Serene	
				-		-			W		W	W	W	undisturbed	
				S			S					not crowded			
				S			S					well maintained			
												calming elements			
	S		S	S			-					water			
	-						-					water sounds			
	S						S					greenery			
	S		S	S			S	S			S	relaxation			
	S	-	S	S			S	S	S		W	W	peace		
	S	-	-	-			S	W	-		S		silence		
12		-	-	-	-	-	-	-	W	W	-	-	W	Wild nature	
									-					experience nature on its own terms	
									S				S	plants seem to grow wild	
13									-				-	appearance of development without human influence	
		-	S	-	S	W	-	S	W	S	-	S	-	Refuge	
			S		S			S	-	S		S	S	enclosed	
			S		W			-	W	S		W	-	secluded	
			S		S			S	-	S		S	S	lush	
														offering activities such as	
			S					S		S		S		tinkering	
			S					-				S		playing	
			S		S					S		S		being alone	
			S		S			-		S		S		private discussions	
			W		-			S		S				sit and watch people from a distance	
									-	-				staff-only places	
	-		S				S				S	two paths leading to the refuge			
	-		W									possibility to escape			

Note. Blank fields indicate not assessed. A green (S) field may not be read as a positive answer. A dashed (-) field of the row *distance benches* indicates long distances between benches. S = strong/true; W = weak/ambiguous; dash (-) = absent/false.

Appendix IV: QET Matrix Raw Results Framnäs (April)

		Quality prevalence (0-2) in area														Quality	Descriptor(s)
Cat.	Q#	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV		
A	1	S	S	S	W	S	S	S	W	S	S	S	-	-	W	Closeness and easy access	physically close to
									S								visible
									W								easily accessible
									S								doors/thresholds*/locking devices
	2	S	W	-	S	S	W	S	S	W	W	W	-	S	S	Enclosure and entrance	enclosure corresponds to needs of safety and security
									W								not confined
														-			distinct entrance
																	disguised gates*
	3	W	W	W	S	-	-	S	S	S	S	W	W	W	S	Safety and security	no risk physical unpleasantness
				-		S	W						S				falling
				S					S					S			sliding
									S					S			toxic plants
														S			falling into water
		W							-					-			ground cover
																	width
																	suface
																	gradient
																	edges
		S	W														distance benches
																	availability handrails*
				W	S			S		S			W	S			no risk psychological unpleasantness
		S	S		-	S	S			-	W	W					risk of intrusion
		-	-		-	S	S			-	W	-	S				unwillingly being viewed by outsiders
		S	S		-	S	W			-	W	-	-				garden users intruding on those indoors
		S	S		-	S	W			-	-	W	-				those indoors intruding on garden users
				S	-								-				ambiguous design
		S	S					S		S	S		S	S			soft shapes
								S		S	S		S	S			soft colors
		S															green
		S															lilac
		S															blue
		S															white
		S		S		S											hard angular shapes
		S															intense colors
																	red
																	orange
		S															yellow
		S	S					S									natural sounds
								W									manmade sounds
A	4	S	S	-	S	S	S	S	S	S	S	S	S	S	S	Familiarity	outdoor environment is a natural part of the setting
																	easy to familiarize with outdoor environment
																	different parts are connected to a whole
																	familiar
	5	S	S	S	S	S	W	S	S	S	S	S	S	W	S	Orientation and way finding	distribution and design of
																	paths
																	places
				S													landmarks
																	doorway back to building
																	nodes
																	edges
				S													dead ends
			W														distinct places along paths
		S															boundaries between private and public
		S		-													balance of complexity and unity

		Quality prevalence (0-2) in area														Quality	Descriptor(s)
Cat.	Q#	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV		
B	6	W	-	W	S	-	-	S	W	W	W	W	-	W	W	Different options in different kinds of weather	
		S	-														paths and places offer variation
		S	W	S	S		S		S	S	S	S	S	S	S		sun
		S	S	S	S		S		S	S	S	S	-	S	S		shade
		S	-	W	S		-		S	S	W	W	-	S	S		wind protection
		-	-	-	S		-		-	-	-	-	-	-	-		rain cover
	1	S	-	W	W				-	-	S		-	-	-	Joyful and meaningful activities	dry benches**
		S	S	S	S	-	-	S	-	S	S	S	S	S	S		corresponding with user needs/wishes
																	stationary activities
																	relaxing
																	drinking coffee
																	reading
	2															Contact with surrounding life	social activities
																	physical activities
																	therapy activities
																	garden activities
										S							walking routes
																	contemplation
B	3															Social opportunities	exercise
		W	W	S	S	S	S	W	-	S	S	S	S	-	S		children visitors*
		W		S													possible to engage with
		S															moving things
		S															changing things
				-													pets
	4															Culture and connection to past times	people
		S															traffic
		-		S													community
		S		S													viewing surroundings from different places
		S		S													paths connecting with surroundings
		S	-	W	S	-	W	S	-	-	S	W	S	-	W		
B	5															Symbolism/reflection	places for amusement and pleasure
																	meeting places
																	watching others
																	plants and things to discuss
																	outdoor tables and chairs for informal meetings
																	meeting places
	6															Symbolism/reflection	for many people
																	users and visitors to be together by themselves
																	possibility to interact with people from outside healthcare...
		S	S	S	S	S	S	S	-	W	S	S	S	-	S		places offer fascination with human culture
																	signs of peoples values and toil
																	memory-stimulating
B	7															Symbolism/reflection	clothesline
																	hand pump
																	barbecue
																	design and content
																	special character
																	meaning
	8															Symbolism/reflection	something to be proud of
		S	S	S	S	-	S	S	S	S	S	S	S	S	S		elements provoking thoughts about relation between...
																	moss-covered stone
																	other symbols of time**
																	nature's power of transformation
																	aggressive spring greenery
B	9															Symbolism/reflection	winter**
																	autumn**
																	summer**
	10															Symbolism/reflection	

Quality prevalence (0-2) in area															Cat.	Q#	Quality		Descriptor(s)
I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV						
6	S	S	S	S	S	S	W	-	S	S	S	S	-	S	Prospect		inviting green open spaces		
																	views of well-managed		
																	nature		
																	plants		
7	S	S	W	S	S	W	S	S	S	S	S	S	S	S	Space		areas offering restful feeling of entering another world		
																	coherent whole		
8	S	W	-	S	-	W	S	W	S	S	S	S	S	S	Rich in species		variety of species		
				S													animals		
																	plants		
9	S	W	W	S	-	W	S	S	S	S	S	S	S	S	Sensual pleasures of nature		opportunities to experience nature by		
			S				S			S							seeing		
			S				S			S							feeling		
			S				S			S							hearing		
			S				S			S							smelling		
							S			-							tasting		
										S							opportunities to experience		
							S			S							vegetation		
							S			S							flowers		
				S	S		S				S						fruits		
										S							animals		
								S			S						insects		
											S						sun		
											S						sky		
											S						wind		
											-						water		
											S						dawn		
											S						dusk		
	10	S	S	S	S	W	W	S	S	S	S	S	S	S		S	Seasons changing in nature		follow seasonal changes in
																			plants
																experiences			
																activities			
11	S	S	-	S	-	-	S	W	S	W	S	S	W	S	Serene		undisturbed		
							S	W			S	W	W				not crowded		
							S	S			S						well maintained		
							S	-			S	S	-				calming elements		
							S	S			S						water		
																	water sounds		
							S										greenery		
							S	S			S						relaxation		
							S	W			S						peace		
							W	W			S						silence		
	12	-	-	-	-	-	-	S	S	S	S	S	S	S		S	Wild nature		experience nature on its own terms
																			plants seem to grow wild
																appearance of development without human influence			
13	-	-	W	S	-	-	S	S	-	-	S	S	S	S	Refuge		enclosed		
				W				S	W	W	-	-					secluded		
				S				-	W	-	S	S					lush		
				W				S	S		S	W					offering activities such as		
				S								S					tinkering		
				S									S	S			playing		
				S									S	S			being alone		
				S									S				private discussions		
													S				sit and watch people from a distance		
													S				staff-only places		
				S									S				two paths leading to the refuge		
																	possibility to escape		

Note. Blank fields indicate not assessed. A green (S) field may not be read as a positive answer. A dashed (-) field of the row *distance benches* indicates long distances between benches. S = strong/true; W = weak/ambiguous; dash (-) = absent/false.

Appendix V: QET Matrix Raw Results Lyngby (April)

Quality prevalence (0-2) in area														Quality	Descriptor(s)
Cat.	Q#	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII		
A	1	S	S	S	S	S	S	S	W	-	W	S	S	Closeness and easy access	physically close to
															visible
															easily accessible
															doors/thresholds*/locking devices
2	2	S	S	-	S	S	-	W	W	S	W	S	S	Enclosure and entrance	enclosure corresponds to needs of safety and security
															not confined
															distinct entrance
															disguised gates*
3	3	S	S	S	S	S	W	W	S	S	W	S	W	Safety and security	no risk physical unpleasantness
		W	S									S			falling
															sliding
															toxic plants
															fallinng into water
															ground cover
		S													width
		S													suface
		S													gradient
		S													edges
		S	S								-		-		distance benches
															availability handrails*
		W	S												no risk psychological unpleasantness
		S	-				S	S			S		S		risk of intrusion
		W	W								S		S		unwillingly being viewed by outsiders
		-						S			S		S		garden users intruding on those indoors
		W									S		S		those indoors intruding on garden users
											S		S		ambiguous design
		S	S												soft shapes
		S	S												soft colors
		S	S												green
		S													lilac
		S													blue
		S													white
			S												hard angular shapes
		S	S												intense colors
		W	S												red
		-													orange
		S													yellow
		S	S												natural sounds
		-	W												manmade sounds
4	4	S	S	S	S	S	S	S	S	S	S	S	S	Familiarity	outdoor environment is a natural part of the setting
															easy to familiarize with outdoor environment
															different parts are connected to a whole
															familiar
															garden features
															plants
															activities
															people
5	5	S	S	S	S	S	S	S	S	S	S	S	S	Orientation and way finding	distribution and design of
															paths
															places
															landmarks
															doorway back to building
															nodes
															edges
															dead ends
															distinct places along paths
													W		boundaries between private and public
												balance of complexity and unity			

Quality prevalence (0-2) in area														Quality	Descriptor(s)	
Cat.	Q#	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII			
6		-	S	S	S	-	S	W	S	S	-	-	-	Prospect	inviting green open spaces	
			S												views of well-managed	
			S												nature	
		-													plants	
7		W	S	W	S	S	-	W	S	S	S	S	S	Space	areas offering restful feeling of entering another world	
			S												coherent whole	
8		S	S	S	S	S	S	S	S	S	S	S	S	Rich in species	variety of species	
			S												animals	
		-													plants	
9		W	S	S	S	S	S	S	S	S	S	S	S	S	Sensual pleasures of nature	opportunities to experience nature by
			S													seeing
			S													feeling
			S													hearing
			S													smelling
			S													tasting
																opportunities to experience
		S	S													vegetation
		S	S													flowers
			S													fruits
		S	W													animals
			S													insects
		S	S													sun
		S	S													sky
		S	S													wind
	-													water		
														dawn		
	S													dusk		
10		S	S	S	S	S	S	S	S	W	S	S	S	Seasons changing in nature	follow seasonal changes in	
			S												plants	
			S												experiences	
11		W	S	-	-	S	-	-	W	-	-	-	S	W	Serene	activities
			S													undisturbed
			S													not crowded
			S													well maintained
			S													calming elements
			-													water
			-													water sounds
			S													greenery
			S													relaxation
			S													peace
			S													silence
		12		-	-	W	-	W	-	-	W	W	-	-		W
				S					W					plants seem to grow wild		
				W										appearance of development without human influence		
13		-	S	-	S	S	-	W	S	W	-	S	-	Refuge	enclosed	
			S												secluded	
			S												lush	
															offering activities such as	
			S												tinkering	
			S												playing	
			S												being alone	
			S												private discussions	
			W												sit and watch people from a distance	
															staff-only places	
	-												two paths leading to the refuge			
	-												possibility to escape			

Note. Blank fields indicate not assessed. A green (S) field may not be read as a positive answer. A dashed (-) field of the row *distance benches* indicates long distances between benches. S = strong/true; W = weak/ambiguous; dash (-) = absent/false.

Appendix VI: Observations and interviews at Framnäs Gård

Interviews

The interviews with the staff at Framnäs Gård revealed some information about the different areas' uses and significant elements of some areas.

Table 7: Interview material from the staff at Framnäs Gård.

Area / Topic	Interview material (staff)
I	The horticultural area is highly appreciated. Users are too close to building to be seen from inside. Participants like the imperfect expression of the paths around the horticultural area. The windows of large private house near area I is not an issue for participants. Instead, participants express appreciation of the presence of others.
II, III	-
IV	The chickens here are appreciated as companions by participants.
V-VII	-
VIII	The hazel trees provide hideouts . Sometimes, participants go in and hide.
IX	-
X	The large tree trunk in this area is used for seating.
XI	The bench is used vigorously. Some participants like to lay down with the sheep in their pasture. Participants begin by petting the sheep and then they may feel the courage to enter. The sheep are very kind and even more reliable than dogs according to Mikael.
XII	This is a historical site with varying water levels. Participants are sometimes interested in the historical site.
XIII	This pond area has varying water levels. Some participants want to sit on the bank leading down to the pond .
XIV	When the leaves are fully developed the wood edge acts as a visual barrier to the surroundings.
Southern neighbor	The boat standing on neighboring southern property has been standing there for around ten years.
Hammarlöv by	Sometimes participants want to go down to Hammarlöv's historical church , which is then allowed.
Activities	Activities for the participants include growing a plant from seed using an indoor growing facility.
Animals	The facility is an NBR garden "without animals," meaning that the therapeutic activities of the facility consist of garden and plant work, not animal husbandry . However, there are animals at the facility that the participants may interact with at will. Participants may not always enter the horse enclosures. Instead, the participants are allowed into the sheep enclosures.
Visitors	Some former participants come back on weekends and may bring family or friends to visit in order to tell about their experiences.

Note. Dashes (-) indicate area not mentioned in interview. This interview material was collected in connection with the winter analysis.

Observations

The observations that were made at Framnäs Gård are specific findings that provide some additional basis for the QET results. The QET matrix (appendix I)

is an otherwise general checklist, without room for specific explanations.

Table 8: Observations from both visits at Framnäs Gård.

Area(s)	Observation	Relevant QET qualities
I, II	-	-
III	There is a rusty container , bringing symbolic value, a sense of time and atmosphere.	B5
IV	The sheep in this area are highly sociable, comforting and pleasant companions . With their help, the sense of safety, refuge and serenity is highly increased. Being present in the moment, a state of blissful compassion for living beings and a positive outlook on life is catalyzed by socializing with the animals.	A3, B1, B3, B5, B9, B11, B13
V, VI	-	-
VII	This area's contact with surrounding life and prospect qualities vary depending on if the user is standing or sitting . Therefore, other qualities increase in value while sitting, such as serenity and refuge.	B2, B6, B11, B13
VIII-X	-	-
XI	There are remains of a bonfire , a falun red shed and a clothesline , bringing symbolic value, atmosphere and traditional culture.	A4, B4, B5
XII	There is an insect hotel and old agricultural tools near the northern border of the area. The possibility to sit or lay down on the dry, warm grass lends multiple qualities to this area. A variety of different slopes increase the user's ability to choose.	B3, B4, B5, B8, B9
XIII	-	-
XIV	Walking together is a social opportunity in this area due to the forest area's special character.	B3
Multiple areas	Managers of the facility walking around and doing manual work adds to the experience, being something to watch.	B3
Multiple areas	Hammarlöv's church is visible from most parts of the facility, bringing atmosphere, traditional culture and a connection to the surroundings.	A4, B2, B3, B4, B5
Multiple areas	There are tree stumps and fallen trees scattered around the wooded areas, bringing symbolic value, biological diversity and something to discover.	B5, B8, B9
Multiple areas	The driveway allée creates a clear entrance to the facility, acts as a landmark within the facility, brings traditional culture and a strong symbolic value.	A2, A4, A5, B4, B5, B7
Multiple areas	The houses on the facility have traditional façades , bringing strong cultural values and atmosphere.	A4, B4
Multiple areas	There are many different animals (horses, chickens, birds, sheep, goats, wild birds) roaming various parts of the facility that bring life, something to watch and joyful activities.	B1, B3
Surroundings	There is a boat on the southern neighbor's property, being something to watch in the distance, symbolic value and may be reminiscent of the sea.	A4, A5, B2, B4, B5

Note. Dashes (-) indicate no area specific observations. These observations were made over both visits to the facility. Relevant QET qualities indicate a strong connection between the observed object and the specified QET quality. For a key to the QET quality labels, see table 4.

Appendix VII: Observations and interviews at Lyngby Skola

Interviews

The interviews with the staff at Lyngby Skola revealed some information about the different areas' uses and significant elements of some areas.

Table 9: Interview material from the staff at Lyngby Skola.

Area / Topic	Interview material (staff)
I	-
II	The greenhouse in area II is an important meeting point in the facility.
III, IV	-
V	A small, elevated and secluded sitting area against the building wall within area V is appreciated by participants because it is secluded.
VI	The table and chairs out on the field in area VI are appreciated by some participants even though the back is not covered. This sitting area was placed there for participants to create dorodango (polished clay) but remained there since.
VII	-
VIII	It is uncommon to use the neighbor's garden in area VIII, but it has happened when there were raspberries to harvest
IX	The chicken pen in this area is managed by the neighbors. The rooster in the chicken pen may be aggressive.
X, XI	-
XII	Area VII is a more private area than other areas, but some participants like to use it and that is not an issue. The large cherry tree in this area can be harvested as an activity. The bench is popular among participants because it is secluded.
Multiple areas	During heavy rain, there is a flow of water in the rocky water drain between area I and V.
Multiple areas	Area XI, X and IX is shared between the neighbors and the NUR facility.
Multiple areas	There is a walking path leading around the outer border of the property. This path is popular among participants who feel the need to walk.

Note. Dashes (-) indicate area not mentioned in interview. This interview material was collected in connection with the winter analysis.

Table 10: Interview material from the staff at Lyngby Skola (continued).

Area / Topic	Interview material (staff)
Context	The facility owner lives together with their partner and friends in the main house of the facility. The main house is an old school , repurposed to living space. There are other neighbors bordering Lyngby Skola's northwestern property line.
Private/public	The property is split between the NUR owner and their neighbors. Some areas are the neighbors' private spaces but are not physically separated from the rest of the garden. Bibbi informs the participants about this in an initial walkthrough, but it would never be a problem if the participants accidentally stepped on the neighbors' grounds.
Surroundings	The hilly farmland surrounding Lyngby Skola is appealing to many participants.
Activities	Many different crafts are practiced at Lyngby Skola. For example: knitting, brush making and cultivation of plants.
Activities	Every Wednesday the staff take the participants out on a walk in the closely situated nature reserve . Only if the weather is particularly bad will they skip the trip.
Activities	Participants are allowed to walk around the horse pastures bordering Lyngby Skola to the east. The horse farm managers cut the grass around the pastures regularly.
Other	<p>For some participants, the silence at Lyngby Skola is striking.</p> <p>Some participants mention that the road trip out to Lyngby Skola is beautiful and special.</p> <p>When a new participant arrives, one of the first things the managers feel they need to do is make the participants feel at home. A homely indoor environment helps in this process.</p> <p>The gravel surface between areas IV, VI and VIII is used for storage and is not commonly used by participants.</p>

Note. Dashes (-) indicate area not mentioned in interview. This interview material was collected in connection with the winter analysis.

Observations

Table 11: Observations from both visits at Lyngby Skola.

Area(s)	Observation	Relevant QET qualities
I	There was an unpleasant smell by the entrance to the main building. This smell was present during both the December and April visits, and negatively impacted the sense of wanting to stay in this area. The door to the main building makes a tone sound when opened, signaling to any users nearby that someone is coming and therefore reducing the risk of unexpected encounters. The vegetation in this area is mostly at ground level , making <i>sensory pleasures of nature</i> less accessible.	A3, B9, B11
II	The green house creaks in the wind , giving off a mechanical sound. This sound may or may not be experienced as pleasant.	A3, B9, B11
III	-	-
IV	A large, characteristic tree stump in this area has been placed in such a way that it is obvious that it is not there naturally.	B5
V	A large, characteristic stone in this area has been placed in such a way that it is obvious that it is not there naturally. To enter area V from area I, the entrance area, the user must cross a rocky water drain with uneven surfaces . This may be an issue for users with limited mobility.	A1, A3, B5
VI, VII	-	-
VIII	In the south eastern corner of this area there is an enclosed area offering <i>refuge</i> .	A2, A3, B7, B11, B13
IX	The rooster in this area may be experienced as aggressive and somewhat hectic even though it is behind a fence. There is no seating in this area, affecting the <i>social opportunities</i> here.	A3, B3, B11
X	There is a barely visible tree stump in this area that users may trip on.	A3
XI	Having <i>no contact with surrounding life</i> was a pleasant feature of this area.	B2
XII	The only bench in this area is overgrown. There seems to be a " cultural wild nature " present in this area, where the highly cultural environment is pleasantly overgrown with plants. The many windows around this area creates a high sense of intrusion risk.	A3, B12, B13
Multiple areas	Wire chairs may be found throughout the garden. They are easily wiped down to create dry seating. The chairs are comfortable even during winter, as the ice is easily removed from the wires.	A3, A6, B1, B3
Multiple areas	The path leading around the property offers several distinct places along the way. Each area it passes through gains some aspect of <i>joyful and meaningful activities</i> by way of exercise and/or contemplation walking routes.	A5, B1, B3, B5
Multiple areas	The AC fan in area V could be heard in several places nearby, increasing the amount of manmade sounds in the garden.	A3, B11
Multiple areas	There is a feeling of intrusion that may be experienced when the neighbors are outside working in the areas that a participant may walk closely past.	A3

Note. Dashes (-) indicate no area specific observations. These observations were made over both visits to the facility. Relevant QET qualities indicate a strong connection between the observed object and the specified QET quality. For a key to the QET quality labels, see table 6.