Sense-IT

Designing a therapists specific section of the app by the therapists mental model of emotion and an user centered design model

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Inhoud

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Abstract

One aspect of healthy mental behaviour is being able to recognize and describe your emotions. A large part of the population however has trouble with this. To support emotion recognition, the Sense-IT app has been developed for these individuals. The app operates on a smartwatch, which measures heart rate, and an smartphone on which an overview of the heart rate is given. The current study focuses on extending the app to a therapist specific section. This is done by both finding user requirements as well as going into depth on two emotion theories: the basic emotion model and the psychological constructionist model. In total 5 therapists participated, all working at GGNet. Two methods were used, a cognitive task analysis to elicit the mental model on emotion of therapists and a user centered design model to focus on concrete recommendations. For both methods an interview and a literature study were used. The results show the mental model of therapists is more in line with the basic emotion model, which might have implications for the further design of the app. Concrete recommendations were found to draw up a prototype of this specific side of the app. Further research should involve prototyping and developing the app, testing it on usability and implementing the app.
Introduction

Recognising and being able to describe your emotion is important for healthy mental behaviour (Gross & Muaoz, 1995). However, a big part of the population is not capable in doing so, which can be called alexithymia. Alexithymia is considered a trait-like phenomenon with an occurrence of around 10% in the population (Derks, Westerhof, & Bohlmeijer, 2014; Mattila et al., 2008). Four main characteristics are identified as: (1) having trouble identifying feelings and differentiating between emotional and non-emotional bodily sensations, (2) having difficulties describing feelings, (3) a decreased imagination and empathy and (4) an external oriented way of thinking. This leads to a lack in ‘emotional awareness’ (Bagby, Taylor, Parker, & Dickens, 2005).

To support these individuals in their affect recognition, an app has been developed. This app works by having it on both a smartphone as well as a smartwatch. The smartwatch measures the heartbeat, translates that to a scale of five and announces that to the user via the smartphone and smartwatch on a scale of five circles. This results in the developed app Sense-IT. The intention is to give these individuals insights and recognition on their own entries. The main screen of the app on the smartphone and smartwatch can be found in figure 1.

![Figure 1: Sense-IT app. A) The main page of the app on the smartphone. The list with measurements is presented here. B) One of the smartwatch’s displays.](image)

The smartwatch has a built in PPG (photoplethysmography) sensor which measures the blood volume pulse in intensity of infra-red signals (Tamura, Maeda, Sekine, & Yoshida, 2014). Synchronous to this blood volume is the heart rate (Saquib, Papon, Ahmad, & Rahman, 2015). Heart rate however also corresponds to physical arousal (e.g. sports and other physical exertions), which interferes with indicating mental arousal. Additional heart rate gives an indication of only this psychological activation, thus measures physiological arousal without physical exertion (Yang, Jia, Liu, & Sun, 2016). It is also
suggested, according to Yang, Jia, Liu and Sun (2016), that additional heart rate is highly correlated to mental arousal. It measures heart rate acceleration with extracting the increase of physical activity, which is in the original theory indicated by oxygen consumption (VO2). To measure the mental arousal (additional heart rate), the measured heart rate can be subtracted by the predicted heart rate (Yang et al., 2016).

The app has been developed by using the methods based on the “Elements of User Experience model” of Garrett (2010). This model consist of five planes from abstract to more concrete to create a positive user experience. By combining this framework with the CeHRes framework (van Gemert-Pijnen et al., 2011) it is elaborated to how to actually go about in designing a new eHealth intervention (Derks, De Visser, Bohlmeijer, & Noordzij, 2015). The first steps in this combined method were determined by the study of Derks et al. (2015) continued by the development of the actual app by Bout & Loos (2016) and later further evaluated on usability (de Bruin, Derks, & Noordzij, 2017). All research, including the current one, has been conducted at GGNet Scelta, Apeldoorn, which is a clinic specialised on treating patients with Borderline Personality Disorder (BPD).

The study conducted by Derks et al. (2015) focused on the end-user, thus patient, side. The founded requirements indicated a need for therapist to be involved. Also, literature suggest a need for therapists to be involved in the emotion recognition process of their patients (Ogrodniczuk, Piper, & Joyce, 2011; Spek, Nyklek, Cuijpers, & Pop, 2008). Therefore, the main objective of the current study is to discover the requirements of the involvement of therapists in the further development of this intervention.

**Importance of including therapists in the design cycle**

Although it is suggested that therapy for patients with alexithymia to increase their emotional awareness is important (Spek et al., 2008), it is also mentioned that patients with alexithymia are difficult to help in therapy. They might have difficulty reflecting on events and may come across as cold or detached due to a lack of emotional expressions which can negatively affect their relationship with their therapist (Derks et al., 2014; Ogrodniczuk et al., 2011; Lopes, Salovey, Côté, & Beers, 2005). It is therefore important to teach them how to reflect on events and decrease this affected relationship as it can lead to a poor outcome of therapy (Choi-Kain & Gunderson, 2008; Ogrodniczuk, Piper, & Joyce, 2005). To make the psychotherapy more effective in increasing emotional awareness, the therapy needs to be structured and the therapist needs to give explicit support (Spek et al., 2008).

It is also suggested that therapists repeatedly labelling emotion may help the patient become aware of a greater range of emotional experience; also called higher emotional granularity (Barrett, 2004). The emotional awareness can be increased in therapy by making associations between bodily sensations (e.g. heart rate) and subjective states (Lane, Ahern, Schwartz, & Kaszniak, 1997). A biofeedback system, such as Sense-IT can help in making these associations.

Another reason, that is more focused on the design process, to include therapists in this design
circle is that often the adoption of eHealth interventions is hard as they sometimes face scepticism from care takers (Chaudhry et al., 2007). Lack of user engagement can lead to usability problems, which holds true for both patients and caregivers (Nijland, van Gemert-Pijnen, Boer, Steehouder, & Seydel, 2008). The lack in user engagement can also lead to high attrition (Eysenbach, 2005). High attrition, which means a fairly quick drop-out because of multiple reasons such as complexity or not seeing the advantages, is a factor to avoid. It is therefore important to create more user engagement as well as to take away scepticism.

**Emotions**

Therapists need to support the patient in making associations between different situations and emotion, and labelling and explaining these emotions. Therefore, it is important to be aware of the construct emotion and the association between the physical domain and emotion. Emotion has always been a rather broad concept for which no single definition has been given (Mulligan & Scherer, 2012). Even when different experts were asked to give a definition of emotion, agreement could not be found (Widen & Russell, 2010).

Four main models about emotion can be found: basic emotion models, appraisal models, psychological construction models and social construction models (Gross & Barrett, 2011; Russell, 2014). The most prominent model, the basic emotion model, suggests that emotions are automatic syndromes of behavior and bodily reactions (Barrett, 2008). Emotions are unique mental states caused by special mechanisms, each emotion caused by a specific brain circuit (Ekman, Levenson, & Friesen, 1983; Gross & Barrett, 2011; Panksepp, 2005). In this model emotion faculties or categories can be found (e.g. fear or anger). One popular belief is that facial expressions and emotions are directly related (Ekman, 1993). The appraisal model has some similarities as well as differences with this basic model. The appraisal model states emotions are unique mental states and most of the appraisal models do state that emotions have a unique response tendency (Gross & Barrett, 2011). The main difference is that within the appraisal model an emotion is not caused by a specific brain circuit, but rather are extracted from ‘appraisals’, such as our explanations of events.

The psychological construction model has more differences with the basic model. In this model, emotions are not unique mental states, nor do they have unique manifestations or response tendencies. Instead, the emphasis is on the variability of emotion caused by experiences (Gross & Barrett, 2011). Psychological constructionists argue that the basic model is based on common-sense; it is common sense to assume these entities of emotions do exists as we feel them, we perceive them thus it must be there (Barrett, 2006). Based on studies on the brain, the psychological construction model does not support the idea of emotion faculties, rather different combinations of neurons can cause the same emotion (Lindquist, Wager, Kober, Bliss-Moreau, & Barrett, 2012; Wyczesany & Ligeza, 2015).

“Core affect” is a concept originating from the research field of emotion and can be placed within the psychological construction model. While emotion consists of an broad array of definitions,
“core affect” can be defined more precise, “A neurophysiological state that is consciously accessible as a simple, nonreflective feeling that is an integral blend of hedonic (pleasure–displeasure) and arousal (sleepy–activated) values” (Russell, 2003). This means that (objective) measurements can give a distinction between positive and negative affect states (Barrett, 2008), not specific on categories of emotion (e.g. happy, fear, sad). The core affect changes constantly over time (Russell & Barrett, 1999). It is always caused by something (e.g. an object, internal causes or situations) though these causes can be beyond human comprehension.

The last model is the social construction model. In this model emotions are viewed as social artefacts (Gross & Barrett, 2011). It is based on relations and interactions in the social context and function in that context (Mesquita & Boiger, 2014). Emotions, in this case are responses coming from people and other social contexts rather than an internal state. In the current research however, both the appraisal and the social constructionist model will not be discussed further. As the app consists of a biofeedback system on physiological arousal, which can be seen as the arousal part of core affect, the basic and psychological constructionist model are compared to each other. Both theories have a different view on how physiological input associates with emotion.

The therapists are working with the third generation cognitive behavioral therapy (CBT). CBT does not specify one certain approach, but rather a family of approaches (Hofmann, Sawyer, & Fang, 2010). However, a main thought within CBT is that an event is discussed based on thoughts, affect feelings and behavior and that each of these three sides interact and influence one another. It is assumed therapists follow the common-sense model of emotion. This in line with most intuition people have, however, according to the psychological constructionist model this causes “naïve realism” (Barrett, 2006).

In the current study first the mental model of emotion is elicited and this will be compared to both the basis emotion model and the psychological constructionist approach. In the basic emotion model the focus is on emotion categories that can be directly related to for instance facial expressions. In a more psychological constructionist approach the focus should be on the fluctuating psychological arousal. This holds true for both the therapist and the client. Which mental model the therapists have therefore is of importance to explore how they would interpret results of the app.

**Methodology background**

The current study will focus on the therapist specific section of the app. This section is supposed to support the therapist in helping the patient in increasing his or her emotional awareness. The study will focus on gaining practical requirements, serving as recommendations, for the app as well as gaining the mental model of therapists on emotion that can also contribute to forming requirements.

The therapist specific section of Sense-IT should create a positive experience for the users. The newly found model: the ‘Elements-Methods-Products (EMP) framework’ consisting of the model of the Elements of User Experience by Garrett (2010) and the CeHRes roadmap (van Gemert-Pijnen et al.,
2011) aims to create such an experience. The framework provides steps from abstract to concrete (Derks et al., 2015). Following these steps is needed to create a usable and effective system. Not having researched the right requirements might lead to mistakes later, which are then harder and more expensive to fix (Basili & Boehm, 2001). Lack of research in the first stages might also negatively influence the adherence of such an app (Mohr, Burns, Schueller, Clarke, & Klinkman, 2013). The current study will focus in the first phase on the first two planes, strategy and scope, of the EMP framework. This is combined with the contextual inquiry and value specification of the CeHRes roadmap.

To elicit the practical user and design requirements, interviews are conducted by using the multi-disciplinary requirement development approach of Van Velsen, Wentzel and Van Gemert-Pijnen (2013). They suggest to gain information by doing an interview, analysing that interview and giving it labels and make use of a literature study for additional or complementing requirements. Following this method helps avoiding a mismatch between the design part and the users.

To explore the mental model of therapists a Cognitive Task Analysis (CTA) is applied. CTA is a method used to understand the human cognition in certain tasks (Crandall, Klein, & Hoffman, 2006). By gaining this understanding, the information can be turned into an aid to help people perform their tasks even better (Tofel-Grehl & Feldon, 2013). In a review on CTA around 100 methods were identified to perform CTA (Clark, Feldon, Van Merriënboer, Yates, & Early, 2008). However, in general the three primary aspects can be identified on a well performed CTA: knowledge elicitation, data analysis and knowledge representation (Crandall et al., 2006). In the current study, CTA focuses on the way therapists support the patients in making the connection between emotion and bodily sensation. The results of the CTA will form a mental model of the therapists. The first aspect, knowledge elicitation is gathered during the interview. The data can be analysed with coding the data into themes and the knowledge will be presented in a table.

To make further suggestions on how the interface of the therapists should be developed, a list of requirements needs to be created based on both user needs and the mental model. Requirements formed by the mental model of emotion are found by doing both CTA in the form of an interview as well as a literature review (Crandall et al., 2006; Hettinger, Roth, & Bisantz, 2017; Roth & Mumaw, 1995). The user requirements are found by using the method of Van Velsen et al. (2013). This includes doing an interview of the user needs as well as a complementary literature study. An overview of all parts of the study is given in figure 2.
Previous research by Derks et al. (2015) indicated a need for a therapists specific section in Sense-IT, next to the developed app for patients. This need can be addressed by setting the development of this specific section as the overall goal of the current study. To be able to achieve this goal, several questions need to be addressed. The main question, which captures the overall aim of the study, will be: “What User Interface (UI) Design should the application have, that is meant for therapists to support their patients with BPD in recognizing their emotions, in order to provide a positive user experience?” This is researched by answering the following sub questions:

- What are the (user) needs of therapists for using an app to support patients in the enhancement of emotional awareness determined by UCD?
- What are the (design) requirements of an application for therapists to support patients in the enhancement of emotional awareness determined by UCD?

Furthermore, to design a therapist section for Sense-IT, it is important to gain knowledge of the mental model the users have of emotion and adjust that to the design. As there are different theories on emotion, the research question is stated as follows: To what extent does the mental model of therapists and the model of emotion in literature with focus on the Sense-IT application differ? This is answered by

- What is the mental model therapists have of emotion?
- What models does the literature give on emotion, in particular to the relation between physiology, behaviour and experience?
Methods

Respondents

In total 5 respondents participated. All participants work at GGNet Scelta, Apeldoorn. These respondents were selected based on the stratified sampling method. In this method the whole population is divided into subcategories which are called strata (Lohr, 2009). These strata represent the different functions at the organisation. Table 1 gives an overview of these subpopulations/strata.

Table 1
Strata/subpopulations of therapists in GGNet Scelta Apeldoorn

<table>
<thead>
<tr>
<th>Group</th>
<th>Group name</th>
<th>Number of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Psychiatrists</td>
<td>3</td>
</tr>
<tr>
<td>G2</td>
<td>Clinical psychologists (in training)</td>
<td>3 (2)</td>
</tr>
<tr>
<td>G3</td>
<td>Bodily-oriented, Music or Arts</td>
<td>5</td>
</tr>
<tr>
<td>G4</td>
<td>Socio-therapists</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>25 (2)</td>
</tr>
</tbody>
</table>

An independent probability sample was used to draw respondents from the strata. In total 1 of G1, 2 of G3 and 2 of G4. No participants of G2 were included, due to time restrictions in both the participants and researchers schedule. Two of the participants were male, three were female. Three of the participants had participated before in research on Sense-IT, of which two in the most recent study. All of them used technical products (e.g. smartphone, tablet) often and 4 out of 5 indicated to not have much difficulties with it. The average age was 42 (SD = 15). The youngest was 30, the oldest 62.

Materials

For the interview, an introduction to the topic and a set of questions were created that were semi-structured (Appendix A). The questions were stated in Dutch. The interview, printed on paper, consisted of questions for the CTA and on (user) requirements. The developed app, Sense-IT, was used during the interview. The app operates on two devices: a smartphone (Moto G 3rd generation) and a smartwatch (Moto 360 2nd generation). Both run on Android. The session was recorded with an audio device.

Next to the interview, two literature reviews were conducted. The main topics of these literature reviews are user requirement for eHealth apps and Emotion theory. The literature is found on Scopus and Science Direct.

Ethics

Before the data gathering of this study, ethical approval was requested from and granted by the behavioural, management and societal sciences ethics committee of the University of Twente. Next to that, before taking part in the test, an information letter was send to the respondents (Appendix B). Also,
before the test, an informed consent (Appendix C) was signed by both the respondent as well as the researcher.

Procedure

The interviews lasted 36 minutes on average. The interviews took place at an office at GGNet Scelta, Apeldoorn. The interviews were one-on-one. Participants filled in the informed consent and after that the audio recording started. The interviewees were first introduced to the topic, followed by answering some demographic questions. Afterwards, several topics were discussed: emotion recognition with patients, theory of emotion, heartrate and emotion, affinity with technology, display of measurements, form and tasks of the to be developed system and the visual display. During the interview, to introduce Sense-IT and the development so far, the app is shown on both devices. The relation between heart rate and affect was not told at the beginning, but after asking about heartrate and emotion. At the end, respondents had the opportunity to give extra comments and/or ask questions.

The literature retrieved, is reported based on the steps in the PRISMA flow chart (Moher, Liberati, Tetzlaff, & Altman, 2009). For the first main topic, the user requirements in eHealth apps, the keywords are based on the main research question. They are displayed in table 2.

Table 2
Search terms for literature study on requirements

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Related/broader/more specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>User interface</td>
<td>Requirement(s), Design, Heuristics</td>
</tr>
<tr>
<td>Therapists</td>
<td>Treatment, clinics, counsellors</td>
</tr>
<tr>
<td>Platform</td>
<td>App, eHealth</td>
</tr>
</tbody>
</table>

The literature found is up to April 2017. From all literature found, first duplicates were removed. After, records were screened on title and non-relevant articles were excluded. After a more extensive screening was done based on abstract. The number of articles left was used for the comparative and additional literature for requirements. See Figure 3 for all steps in the process and the number of articles. The remaining articles as well as the search strings can be found in Appendix D.

Figure 3: Flow chart, based on the PRISMA flow chart, that represents the steps taken and the number of articles included and excluded at each step

The second main topic for the literature review was emotion theory. For this topic, the keywords are stated in table 3. Some decision rules were used to determine which articles to use. These decision rules
are: (1) having both theories equally present in the outcome of the literature review, (2) usage of prior knowledge of both theories and (3) using prior knowledge on researchers in the field. The steps taken can be found in figure 4. An overview of the remaining articles used and search strings can be found in appendix E.

Table 3
Search terms for literature study on emotions

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Related/broader/more specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotion</td>
<td>Valence, arousal</td>
</tr>
<tr>
<td>Response coherence</td>
<td>Physical response, emotional response</td>
</tr>
<tr>
<td>Emotion systems</td>
<td>Faculties, emotion categories, constructionist approach, mental model</td>
</tr>
</tbody>
</table>

Figure 4: Flow chart, based on the PRISMA flow chart, that represent the steps taken and the number of articles included and excluded at each step on emotion

Data analysis

User requirements

The interviews were transcribed by using the transcription programme F4, which is a programme supporting the transcribing progress. The transcription was made verbatim and analysed in Atlas.ti. Atlas.ti is a programme used to easily code the transcription by creating codes. This analysis is based on the method by Bergvall-Kareborn and Stahlbrost (2010) as suggested by Van Velsen et al. (2013) to use in the elicitation of requirements. The method consists of first familiarising with the data and continuing with capturing quotes that are important to the goal of the eHealth technology. These quotes are first translated from Dutch to English and can be placed in the first “user quotes” column. Next an attribute is to be determined which summarises the overall users feeling. The quotes can be grouped on attributes. Afterwards, the attributes are checked and if necessary adjusted. Per attribute, one or more requirements are stated. Next, the values are determined. A value, here, stands for “ideal or interest a (future) end user or stakeholder aspires to or has.” (Van Velsen et al., 2013). Next to that, requirements from literature will elicited on topics of eHealth and (persuasive) design based on the literature study described above. Afterwards, the MoSCoW method is used to analyse priority by putting it in the
categories: Must have, Should have, Could have and Won’t have (at least for now) (Beltman, Vosslander, Molderink, & Noordzij, 2016). Figure 5 gives an overview of all steps.

Figure 5: Follow-up steps for requirement elicitation analysis based on Van Velsen et al. (2013)

Cognitive task analysis

For the CTA the interviews were also transcribed verbatim in F4 and analysed in Atlas.ti.. The analysis is based on Crandall et al. (2006) procedure for analysing CTA data; first prepare the data, second structure the data, then discover the meaning and last identify/represent key findings. The transcription is coded into different themes found during the knowledge elicitation (Crandall et al., 2006). These themes can form a mental model of therapists. Based on this information, the mental model is compared to literature on emotion theory with focus on the Sense-IT application.
Results and Discussion

Emotion

To answer the main question “To what extent does the mental model of therapist and the model of emotion in literature with focus on the Sense-IT application differ?” first the two sub questions will be answered. These are: “What is the mental model therapists have of emotion?” and “What models does the literature give on emotion, in particular to the relation between physiology, behaviour and experience?”

Cognitive Task Analysis

To answer the first sub question, on the mental model of therapists, the answers to questions 3, 4, 5, and 6 of the interview were analysed. Topics included emotions in general, emotion related to their patients and alexithymia and emotion related to heart rate. In appendix F an overview is given of all Dutch Quotes, translated to English, linked to a theme and an overall conclusion of the theme. A summary of this can be found in table 4, displayed below.

Table 4
Cognitive Task Analyses divided over different themes. Each theme is summarised to a conclusion

<table>
<thead>
<tr>
<th>Theme</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>All therapist indicate to do something with coupling emotion to physical experience. One therapy, BOP, is especially focused on that.</td>
</tr>
<tr>
<td>Emotion categories/basic emotion</td>
<td>Emotions get handled by calling it in terms of both pots as well as basic emotion categories</td>
</tr>
<tr>
<td>Stopping at a moment</td>
<td>It is important for therapist to make the patients aware of emotions by letting them take a moment to realise what they are feeling</td>
</tr>
<tr>
<td>Getting space</td>
<td>One of the most important things is to give the patient room to vent their emotions</td>
</tr>
<tr>
<td>Procedure of starting to discuss emotion</td>
<td>Hard for most therapists to describe the procedure as it is a thing they do without giving it too much thought. Though the procedure mostly starts with giving space and starting with physical feelings.</td>
</tr>
<tr>
<td>Interpretation of graph in interview (heart rate graph)</td>
<td>The interpretation of the graph with heart rate was interpreted as two peaks, one very high, one smaller. It was interesting to see what made the peak come, thus what happened that made an increase in heart rate and how did they calm down again. It was not clear to all therapist which was the standard/average heart rate.</td>
</tr>
<tr>
<td>Indicating arousal</td>
<td>All therapists indicated that heart rate and psychological arousal are related, three therapists think a full linear relation</td>
</tr>
</tbody>
</table>
Methods

There are a few methods that are used. However, within those methods there is a lot of room for interpretation. Some therapists use more components of these methods than others.

Alexithymia

For different kind of therapists there are different ways to start with patients suffering from alexithymia. Most of all it is creating space, but also giving psycho education on emotion or starting with asking a questions on physical feelings.

In general, for emotion regulation there are two sorts of therapy used. The ‘emotie regulatie therapie’ (ERT) and the ‘vaardigheden Emotie Regulatie Stoornis’ (VERS) are mainly used to help patients in recognising their emotions. Part of this is psycho education, thus learning the patient why it is important to regulate your emotion. Another part is practicing with the regulation of emotion. One way is describing emotion in terms of intensity with pots with milk. It is used as a visualisation, with at five pots the milk is boiling over the pot.

Next to the pots, a lot of therapy and interaction is about bodily sensations. This is most present in Bodily-Oriented Psychotherapy (BOP), in which exercises are executed relating the body to mental states. As one BOP-therapist concluded: "They learn to make the connection of when something happens in the body, or when something intensive happens, something happens in the body". The body is also used when trying to talk about the emotion patients have. This starts with asking about what they feel in their body. It is important that they take a moment to realise what they feel and get room to vent and trust from their surroundings to experience with this feelings.

When asked about the relation between heart rate and emotion/arousal every therapists noted that they are related, some even saying “Yes, 100 % (...) yes I think that that is a linear relation.”. Therefore most people therapist think Sense-IT can give a lot of insights in mental arousal. It was also indicated that they would not know when the heart rate would indicate physical or mental arousal. When told about the additional heartrate, the overview became more interesting for the therapists as there was more certainty the bodily reaction was associated with mental arousal.

Another aspect all therapists did agree upon was indicating emotion with emotion categories. These were not appointed by the therapists but rather discovered together with the therapist, both by talking about what they feel and what they are thinking. They use basic emotions for multiple reasons. One of them is to speak in the language that the patient knows and is known outside the clinic. One therapists indicated: “Yes we want just that: speaking the normal language.”. Others use it as a framework: starting out simple with four basic emotions and specifying that more and more when the patients is ready for that.

To conclude, to support patients in recognising and regulating their emotion they try to give them room for venting and let them take their moment to realise what emotion they are experiencing. This is prompted by exercises with the body or talking about bodily sensations. The emotion the client is feeling is expressed or in pots for the intensity of the emotion or indicated in basic emotion categories,
that can be more specified when the patient is in a more advanced stage. All of this is mostly in line with the basic emotion model.

**Literature review**

To answer the second sub question “**What models does the literature give on emotion, in particular to the relation between physiology, behaviour and experience?**” a literature study was done. An overview of the articles used can be found in Appendix E which gives an overview of the title, author, keywords, year and source. The results of the literature study show articles that both favour the basic emotion model as well as articles that favour the psychological constructionism model.

The differences between the two models became most clear in the comment article written by Lindquist, Siegel, Quigley, & Barrett (2013) and the reply to that by Lench, Bench, & Flores (2013). In the comment by Lindquist et al. (2013) it was suggested that the previous work of Lench, Flores and Bench (2011) “findings do not support their claim that discrete emotions organize cognition, judgment, experience, and physiology because they did not demonstrate emotion-consistent and emotion-specific directional changes in these measurement domains.”. Lench et al. (2013) replied to that the comment was based on a misunderstanding on the methods, thus still supporting their claim about basic emotion.

Scarantino and Griffiths (2011) also support the claim of basic emotion, though in a moderate way, indicating three notions of basic-ness. These three notions, conceptual, biological or psychological, are independent of each other. The biological notion explains the relation between physiological part and emotion events. They highlight the evidence of the psychological constructionist model as compelling, however argue that this evidence does not rule out the existence of biologically basic emotion. They suggest not to just use unqualified (folk) emotion categories and that they should use an anti-essentialist approach to biological emotion.

Barrett and Wager (2006) discuss the debate in a neurological way. They name a couple of meta-analyses that related the brain to emotions. They discuss that though on first glance basic emotion may be natural kinds of the brain, when observing more carefully there is not that much consistency or specifics found. For example, different meta-analyses showed the emotion category “fear” to be related to the amygdala. However, in the end this turned out for 40 to 60% of the cases. Furthermore, usually for broader spectrums of an emotion, the same sort of correlations could be found. They suggest more research into this topic was needed. This was done by Lindquist et al. (2012) who found neuroscientific evidence in line with the psychological constructionist model: “**A set of interacting brain regions commonly involved in basic psychological operations of both an emotional and non-emotional nature are active during emotion experience and perception across a range of discrete emotion categories.**”

Another study discusses response coherence, indicating the coherence across experiential, behavioral, and physiological responses in emotion (Evers et al., 2014). The authors take into account the evidence found that contradicts a response coherence. However, they also take into account the evidence showing a degree of response coherence. Therefore, they take a dual-process perspective in
which psychological responses is the combination of two independent processes: automatic (unconscious) versus reflective. They found a high degree of coherence on both processes separately, thus coherence on automatic and coherence on reflective. However, it was not found across them. This implies a new model to response coherence in which whether coherence is observed depends on the process used.

All in all, the literature review mainly gives an overview of the many different approaches within a model. Even though some articles promote the basic emotion model (e.g. Scarantino & Griffiths, 2011) they do question some of their methods used and encourage a change within the model. This was not evident in the psychological constructionist approach

Results emotion

The results from the two sub questions, described above, will be discussed to answer the main question: “To what extent does the mental model of therapist and the model of emotion in literature with focus on the Sense-IT application differ?”

In the literature review two main approaches are discussed. One is the basic emotion approach (e.g. Lench et al., 2013; Scarantino & Griffiths, 2011), the other one a constructionism approach (e.g. Barrett et al., 2009; Lindquist et al., 2013). The main difference is that the basic emotion model assumes that there are specific mechanisms and unique (neuro)physiological manifestations that account for an emotion. The constructionist model does not account for emotion categories as it assumes an interplay of varying factors and (neuro)physiological states that can contribute varying affective dimensions.

The mental model of therapist can be more related to the basic emotion approach, which uses emotion categories. Therapist use these emotion categories to indicate emotion with their patients. In discussion with the patients, based on the ERT and VERS, questions are asked about how they feel (physically) and what they are thinking. This is then, together with the therapists, coupled to a basic emotion by the patient. This is in line with the basic emotion approach.

Some of the therapists also believe that there might be a full linear relation between an increased heart rate and emotion/tension (e.g. “Yes, 100 % (…) yes I think that that is a linear relation” and “So I think there is a 1 on 1 connection between increasing tension and increasing heart rate”). According to the constructionist approach there is no linear relation. According to the many-to-one principle, many different combinations of things can lead to one event (Cacioppo, Tassinary, & Berntson, 2000). This is also indicated as the principle named degeneracy: many neurons can create the same outcome (Barrett, 2017; Edelman & Gally, 2001). Thus many different combinations of different neurons can produce the same sort of emotion. This is what is also found in multiple brain studies, that do not support the basic emotion approach (Lindquist et al., 2012; Wyczesany & Ligeza, 2015).

Though the mental model of the therapist is mostly in line with the basic emotion theory approach, it does have some overlap with the constructionist approach as well. The main idea of this psychological constructionist approach is, opposed to the basic emotion approach, that the emotion
categories (e.g. anger, fear, happy) are not the building blocks of emotion but instead represent mental episodes that result from the varying interplay of things as physiology, behavior, cognition and experience (Barrett, 2009; Lindquist et al., 2013).

This interplay is what therapists focus on as well when talking about emotion with patients. One of the main aspects, when talking about emotion, is physical feeling: what are they feeling. This can be things as an increased heart rate, increased breathing, stomach- and/or headache. Which then continues to which behavior, experiences and what the patients are thinking. All these perceptions conclude to an emotional event. After discussing these events, however, basic emotion categories are referred to.

Although these emotion categories are not part of a constructionist view in that way, it is important to note that even though commons sense basic categories do not exist the way presented in basic emotion approach, according to Barrett (2017) it is a good thing to make use of emotion words. By labeling your own experiences and for example kids, connections are made in the brain, which helps individuals better function in society. This can be seen as a part of (mental) education. It can be argued that this is what is needed with patients as well, therefore therapists should also continue in basic emotion categories.

However, when following the constructionist approach, therapists still need to be aware that there is not a one on one connection between heart rate and emotions. There are no specific boundaries between basic emotions (Barrett, 2006). The emotions can be presented in the scale of hedonic (pleasure-displeasure) vs arousal (sleepy-activated) (Russell, 2003). This is partly done by the therapists at the moment, by the system of the pots to describe the intensity of the emotion. However, in a study by Suvak et al. (2011) it was suggested that patients suffering from BPD struggle more with the arousal opposed to the hedonic axis. It was recommended that with novel strategies, such as a biofeedback system, could enhance the emotional granularity by gaining more information on arousal. One way this is done at the moment is by using the pots.

Therefore, for therapist to support the enhancement of emotion granularity, they need to understand the app and the results it shows. The Sense-IT app has a neutral look, which is good for its simplicity and easiness to use according to the therapists. However, this also leaves a lot of room for interpretation to the therapists. The therapists can easily fall back into a more basic emotion approach, expecting a stable agreement between psychological and physiological changes (e.g. when there are a lot of circles, someone is angry). Sense-IT, has the advantage of being neutral, and for therapists being able to use it in a more constructionist fashion. This does mean Sense-IT should stimulate a more constructionist way. This mean indications need to be given that the app is based on additional heart rate and might correlate with mental arousal (Yang et al., 2016) and thus not on the hedonic dimension or one of the basic emotion categories. In addition, any moment needs to be seen as an instance in which an emotion can arise with varying bodily sensations, thoughts and behaviors.
Concrete recommendations

To answer the main question: What User Interface (UI) Design should the application have, that is meant for therapists to support their patients with BPD in recognizing their emotions, in order to provide a positive user experience?” first two sub questions will be answered about user needs and design requirements.

User Needs

The values found represent the “ideal or interest a (future) end user or stakeholder aspires to or has.” (Van Velsen et al., 2013). The full table of quotes, attributes, requirements and values can be found in Appendix G. The quotes, translated from Dutch to English, can be found in Appendix H. It should be noted that the quotes contain client and patient. Both indicate the same. Values answer the sub question: “What are the (user) needs of therapists for using an app to support patients in the enhancement of emotional awareness determined by UCD?”. The values, linked to the user needs, can be found in the table below (table 5).

Table 5
All user needs found coupled to the values found in the analysis of the interviews

<table>
<thead>
<tr>
<th>Value</th>
<th>User Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quick overview</td>
<td>The therapist has to be able to get a quick overview of the data gathered by patients. This includes heart rate measurements and self-report of patients</td>
</tr>
<tr>
<td>Patient is responsible</td>
<td>The patient has to be responsible for which information he or she wants to share with his or her therapist</td>
</tr>
<tr>
<td>Easy to use</td>
<td>The therapist needs to be able to easily understand and use the system</td>
</tr>
<tr>
<td>Personal communication</td>
<td>The therapists need to be able to discuss results with the patient on a personal level, the system should support this.</td>
</tr>
<tr>
<td>Neutral visualisation</td>
<td>The therapist wants a neutral interface design</td>
</tr>
<tr>
<td>Easy access</td>
<td>The therapist needs to be able to easily access the system</td>
</tr>
</tbody>
</table>

Quick Overview

One of the main needs of therapists was to get a quick overview of patients data. It should not contain much time to spit trough all data, but should give a clear overview of a day.

Patient is responsible

All therapists mentioned that using the Sense-IT would not differ from other sort of therapy or exercises available at GGNet Apeldoorn. This means that the client should be able to choose which information to share with its therapist and has full responsibility in it. Most of the therapist would encourage to share,
however, not push them. As one therapists says: “For me it is no different than it is now. The client shares what it wants to share or can share or thinks the therapist of group can handle.”

**Easy to use**

One of the main things mentioned was that the system has to be simple. One of the reasons not to use the device was that it would be too difficult to operate, for either the therapists or the patient. The system should support the therapist, which can only be achieved if the system is easy to use.

**Personal communication**

Most therapists, when asked if they wanted to put comments in the system for the patient to read, answered with a no. Personal communication, talking face to face with a client, was much more important. One therapists mentioned that if not talking to the patient “the contact turns out really strange.” and another therapist mentioned that “then it will turn out to be very digital in the end.”. Therefore they need the system to encourage discussing results together. This could be either via printout or watching results on a tablet. As one therapist mentioned: “I think the Sense-IT alone is not enough. I think it’s useful to do it together.”

**Neutral visualisation**

The therapists, except for one, indicated to not need options for personalisation. The other one indicated not to have a real preference whether personalisation options were included or not. It was further stated that it should have a neutral look: “I think it should stay neutral. Too cheery, I think, would look a bit like a game. But uh... only black and white would be a bit too heavy”. Most therapists liked the colours and style used in the Sense-IT app and would like it to have a similar look.

**Easy access**

Another value to the therapists was easy access. One of the main things the therapist would like to see it that it is in some way accessible through the system they are already working in. Only one therapist indicated to have no preference whether or not it was related to the system that existed.

**Design Requirements**

Below, in table 6, the results for the UI requirements can be found. The requirement are based on quotes from the interview question 7 to 11. These are used to answer the following sub question: “What are the (design) requirements of an application for therapists to support patients in the enhancement of emotional awareness determined by UCD?”

First of all, the value quick overview translates to many requirements. This includes self-reports to look at, as a graph on its own does not indicate enough. It was furthermore noted that not only day overviews should be given, but also week overviews. With this overview a comparison option would be a useful feature. This means that the system should be able to compare day to day and week to week to indicate whether there are patterns in arousal.
To facilitate the value that patients are still responsible for what they want to share, the system must make it available in the patient’s app to let them share what they want to share. This information should then be send to the platform used by the therapists. As a smartphone is a too small device, it was suggested to include multiple devices such as being available on the computer, but also on for instance a tablet or making it easy to get a print-out. This would also make it easier to discuss the data.

Another aspect indicated during the interview was that it should be easy to use the system. It should not have too much functions to make it complicated. One of the few functions it should support is letting therapist write notes down in the system. Next to this it should not have much more additional functions, except for giving the clear overview. Functions for personalisation are also not necessary, a more neutral overview would suffice.

Most therapist indicated, to be able to work more sufficient with the system, was to have it integrated with the GGNet system. That way, it would be easier to use as the therapist do not need to switch between systems. Furthermore, to make it more easy, the system should be well facilitated and work properly. This means that before using it, the system should not have all kinds of problems and there are enough devices to work with.

User Interface recommendations

Thus, to answer the main question “What User Interface (UI) Design should the application have, that is meant for therapists to support their patients with BPD in recognizing their emotions, in order to provide a positive user experience?” there are a few aspects that are important to include. The first one is that it should work on multiple devices, which would also stimulate discussing the results together with the patient. Next, the main function of the system is to provide a clear overview with the self-reports made by patients and potential notes made by therapists. Next to that, the system should stay as easy to use as possible, with a neutral look and not many additional functions. This was also found in the literature study (e.g. Ma et al., 2015; Simons & Felix Hampe, 2010) A full overview of these concrete requirements for a therapist specific section of the app is displayed in the table below (table 6). This includes both requirements formed on the method of Van Velsen et al. (2013) and the CTA.

There are some point of consideration. Although all therapists indicated to like a style such as a graph that would be similar to the graph shown, this could be due to the order of the questions. As the graph was presented first, and later the therapists were asked about what they would like they might have been biased by the picture they saw before (Dooley, 2009). Another consideration is that one of the therapists indicated not to want any system for themselve at all. The results of Derks et al. (2015) do show a need for a therapist specific section of the app. The results above are also based on a need for such a system. However, this result should be taken in consideration when implementing this section of the system, as it might get some resistance.
Table 6
All requirements found in the interview on the User Interface and CTA divided over values. Each requirement is indicated on the MoSCoW labelling, indicating its priorities.

<table>
<thead>
<tr>
<th>Value</th>
<th>MoSCoW</th>
<th>Requirements</th>
<th>Requirements CTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quick overview</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Must</td>
<td></td>
<td>The system must be able to give an clear overview in a graph</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The system must be able to compare different days or weeks to each other</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The system must recognise patterns in heartrate</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>The system must both show the process of the peaks and declines</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The system must show single days as well as week overviews.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The system must make clear that is makes use of additional heartbeat</td>
</tr>
<tr>
<td>Should</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The system should include the self-reports of the patient</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The system should make the self-reports of the patient easy to find in the graph</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>The system should indicate what the neutral state is in the graph</td>
</tr>
<tr>
<td>Won’t</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The system won’t compare patients to each other.</td>
<td></td>
</tr>
<tr>
<td>Patient is</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>responsible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Must</td>
<td></td>
<td>The system must let the patient decide which information to share</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The system must give clients space in what they want to share</td>
</tr>
<tr>
<td>Easy to use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Must</td>
<td></td>
<td>The platform for therapists must be available on multiple devices (smartphone, laptop, tablet)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The system should be easy to operate</td>
<td></td>
</tr>
<tr>
<td>Should</td>
<td></td>
<td>The system should allow the therapist to make notes in the application</td>
<td></td>
</tr>
<tr>
<td>Could</td>
<td></td>
<td>The system could be able to make printouts easily</td>
<td></td>
</tr>
<tr>
<td>Personal communication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Should</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The system should give the opportunity to discuss the results together</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>The system should stimulate to talk in person to patients, not in the app.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Need</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>The system should stimulate to talk in person to patients, not in the app.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Neutral visualisation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Must</strong></td>
</tr>
<tr>
<td>The system must be able to show the use of additional heart rate.</td>
</tr>
<tr>
<td><strong>Should</strong></td>
</tr>
<tr>
<td>The system should not have to provide options for personalisation</td>
</tr>
<tr>
<td><strong>Could</strong></td>
</tr>
<tr>
<td>The system could have a neutral appearance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Easy access</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Must</strong></td>
</tr>
<tr>
<td>The system must work properly</td>
</tr>
<tr>
<td><strong>Should</strong></td>
</tr>
<tr>
<td>The system should be integrated in the GGNet system</td>
</tr>
<tr>
<td><strong>Won’t</strong></td>
</tr>
<tr>
<td>Sense-IT won’t (yet) be well facilitated</td>
</tr>
<tr>
<td>Sense-IT won’t (yet) become an integral part of GGNet</td>
</tr>
</tbody>
</table>
General discussion and further recommendations

The results indicate that the assumption of therapists following a basic emotion model seems to hold true. The other more recent constructionist model contradicts this model in the connection between the physical domain and experienced emotion. The exclusion of the other two models, the appraisal model and the social constructionist model, does not have much influence on the results. The results showed the assumption of therapist using the basic model to be true. By comparing that to a contradictory theory, the mismatch therapists make is shown. What might be interesting, however, is comparing the other two theories to the mental model of therapists as well as to the implication of Sense-IT to gain more understanding in the position of Sense-IT and the therapists.

What became apparent in the literature review was that the basic emotion theory was not supported by many in its current status. However, other approaches to this theory were proposed such as a dual process response coherence (Evers et al., 2014) or separating emotion into different notions, including biological emotion (Scarantino & Griffiths, 2011). One could say these theories are compromises coming from naïve realism: researching the way we believe it is (Barrett, 2006). This does not indicate basic emotion theory should be neglected, however, recent studies have found more proof for the psychological constructionist theory (e.g. Lindquist et al., 2012; Wyczesany & Ligeza, 2015).

The overall study has a few points of consideration as well as the methods that are discussed before. First of all, the sample size was small (N=5) which might have a negative influence on the saturation. In total, 4 groups of functions are present at the clinic. However, there were no participants from the group psychologist, who might have a different input than the others as they have a different function within the organisations and play a different role in the patient’s life. They might need different functionalities to be present in the app, which are now unknown. Furthermore, participants could indicate themselves whether they were interested in participating. Though everyone had an equal chance to participate, it might be that only participants respondent that were more in favour of Sense-IT in general, which might lead to the answers being more biased (Dooley, 2009). Therefore in a further study, it might be useful to purposively select a more balanced group of participants that are more and less enthusiastic for Sense-IT to get a better represented sample.

Another point of consideration is the size of the literature studies. As a more extensive literature study would be out of scope for the current design thesis it was decided to have only a few articles as the result of the literature study. Though the selection of articles was structured, the disadvantage of a lower amount of articles does mean some information might be missing. In the study only two main theories of emotion (basic vs constructionist) were included, though there are much more variations within these models as well as other methods. As mentioned before, four different theories exist (Russell, 2014). Though not all variations have been thoroughly discussed, the overview does give an indication of two theories. As indicated before, it would be interesting to compare the other theories as well to the current status of Sense-IT.
For the practical side, the difference between the two theories do have a minor implication. As therapists are currently having a mental model similar to the basic emotion model, the results of the app will be interpreted in that way. This would mean different heart rates will be coupled to certain basic emotion categories. To stimulate a more psychological constructionist approach the interface will have to support that by making clear these variations in heart rate are not directly coupled to emotions but to physiological arousal. Though in practice, most of the information therapists will look at will be gained to fluctuations and events happening around that moment. The therapist want to be able to show and make the patient aware of how much fluctuation in emotion they have. As the patients have trouble indentifying their emotion, increasing this can already be supported by discussing these fluctuations or even the more steady moments. It is likely that the patient is not yet aware of these fluctuations or steady moments. From this realisation the therapists can build further into improving the emotion recognition to get to talk more into what really happened in such a case.

To explain the use of the theories in practice more a simplified case will be displayed below followed by what this would result in. The case displays a group therapy, which consists of 9 patients and their therapist. All patients are wearing there smartwatch and are using the app. At a certain moment one of the patient gets four circles displayed on his screen. The therapists wants to discuss this and asks: “why are you so upset all of the sudden?”. Following the results of the CTA, the likelihood of this scenario to happen with some of the therapist is high. This mental model, as mentioned before, is mostly in line with the basic emotion model. Thus a certain circle might be coupled to a certain emotion category.

Following the psychological constructionist model this is not a likely scenario, or at least not a scenario this model wants to unfold. The circles, according to this model, do not indicate a specific emotion category. Four circles does not indicate one thing. Therefore, rather than asking why he or she is upset, it’s more about what (event) happened, what are you (physically) feeling? Trying to figure out what the fluctuations mean instead of pointing to a certain emotion.

It must be noted here that these are simplified cases. In fact, some of the therapists might lean a bit more to the psychologist constructionist side. In practice, the first situation of following a basic emotion model is not useful. The discussion will pinpoint onto a certain emotion category instead of discussing all things surrounding it. This might confuse a patient. Therefore, as mentioned before, it is important for the therapist to know what the app actually indicates and even more important: what it does not indicate. It is therefore recommended to either make this clear in the app or provide a course for the therapists in which this is made clear.

Recommendations for further studies are that it is first important to make prototypes of the therapist specific section and let them be tested on usability. A suggested way of executing these usability testing is staying in line with previous research on Sense-IT (e.g. de Bruin et al., 2017; Derks et al., 2015). Therefore usability testing should be executed with both the therapists (users) as well as experts in the field of usability or other associated fields to test the product. This implicates developing
the product first. After, therapists can use the app for a couple of days to test how usable it is and what can be improved. Then, to get more insights in improving usability in a more general sense, experts in the field of usability can test it. A suggested way of doing this is by a cognitive walkthrough (de Bruin et al., 2017; Jaspers, 2009).

Sense-IT can be further developed by working out the last two stages of the CeHRes model: operationalisation and evaluation (van Gemert-Pijnen et al., 2011). In the operationalisation stage the app actual is introduced in the working environment. In the (summative) evaluation stage a final evaluation is done on the outcomes of the product, Sense-IT. In this phase different outcomes are measured, such as usability and costs. If an outcome turns out negative the choice needs to be made whether or not to change this part (van Gemert-Pijnen et al., 2011).
Conclusion

This study aimed to make a start in the development of a therapist specific section in the Sense-IT intervention. For this, the mental model of therapist on the relation between the physical domain and emotion was elicited as well as more concrete recommendations for an user interface that leads to a positive user experience. In the end the mental model of therapists had most similarities to the basic emotion model. The literature review however showed that mostly in the past years the psychological constructionist model gains more evidence. Next to that, the basic emotion model as it was before, has many concerns. It was discussed that the mental model of therapists being similar to the basic emotion model has some practical implications: it is important that the therapists know what the app shows. Following the psychological constructionist approach this means indicating that simple, positive, linear relationships between physiological factors and emotion categories do not exist. The results further highlighted the practical recommendations, both formed by the mental model as well as user needs and values. It was recommended to take the (design) requirements to develop the specific side of the app and test it both on usability as well as in the field to further develop Sense-IT.
References


Bout, M., & Loos, B. (2016). Sense-IT continued: Enabling self-monitoring and feedback for people...
with BPD, through a personal touch. Enschede.


Appendix A

Interview schema

Allereerst, hartelijk bedankt voor het willen deelnemen aan dit onderzoek. Het interview zal ongeveer tussen een uur duren. De gegevens worden anoniem behandeld. Allereerst wil ik u vragen om het toestemmingformulier door te lezen, en als u het er mee eens bent dit te ondertekenen. Heeft u nog vragen voor we verder gaan?

Zoals al eerder vermeld zal dit interview gaan over de Sense-IT app. Voordat ik daar meer over vertel wil ik graag eerst een aantal dingen vragen:

- Hoogst genoten opleiding
- Leeftijd
- Eerder onderzoek mee gedaan over de Sense-IT app

Sense-IT is een app die wordt ontwikkeld om patiënten met borderline te ondersteunen in het herkennen van emoties. Deze app wordt zowel op een smartwatch gebruikt als een smartphone. De smartwatch meet de hartslag en geeft op die manier een indicatie van emotie. Hiervan krijgen ze meldingen. Bij deze meldingen kunnen ze opmerkingen plaatsen. Het is op deze manier de bedoeling dat ze meer inzicht krijgen in hun emoties, deze beter aanvoelen en er iets mee kunnen.

In dit onderzoek wordt er gekeken naar of de informatie van de app die de patiënten gebruiken, ook omgezet kan worden naar iets wat u, als therapeut, kan gebruiken. We willen nu kijken of de data die verzameld wordt met zo’n app ook aan de therapeut kan worden getoond. De vraag is op wat voor manier dit wordt getoond en waaraan behoefte is. Zijn hier verder nog vragen over?

Dan gaan we eerst in op uw functie bij GGNet.

Algemeen

1. Functie
   - Wat is uw functie binnen GGNet?
   - Wat voor taken vallen binnen die functie?
   - Hoe ziet uw gemiddelde dag eruit?

2. Affiniteit met Techniek
   - Wat voor technische producten gebruikt u?
     - Wat voor producten gebruikt u vooral op werk?
   - Gebruikt u deze producten vaak?
   - Vindt u het gebruik van deze producten makkelijk?
     - Heeft u soms moeite met het begrijpen van nieuwe technische producten (vooral mobiel/computer programma’s)

Sense-IT – August 2017
3. Emotie in het algemeen
   - Hoe worden emoties hier behandeld? Worden er emotiewoorden (bv blij, verdrietig) hierbij gebruikt?
     o Waar herkent u emoties aan?
   - Heeft u ook wel iets anders tegen emotie aan gekeken?

4. Emotie bij patiënten
   - Hoe gaat het normaal in zijn werking om over emoties te praten bij patiënten?
     o Hoe worden patiënten geholpen in het herkennen en beschrijven van emoties?
     o Worden emoties gekoppeld aan gevoel van het lichaam?
     o Wat wordt er stap voor stap gedaan om emoties te bespreken? (niet meer dan zes stappen)

5. Emoties en alexithymia
   - Hoe gaat het in zijn werking als u merkt dat een patiënt erg veel moeite heeft met emotieherkenning (alexithymia)?
     o Kunt u een voorbeeld noemen? Hoe ging u er toen mee om?
   - Wat voor aanpak/methode gebruikt u om over emoties te praten?
     o Welke aanpak?
     o Heeft u hier bewegingsruimte in om het verschillend toe te passen?

6. Hartslag en emotie
   Het systeem laat door middel van bolletjes een benadering van fysiologische arousal zien. Bij een bolletje zit je, voor jouw persoonlijk, in neutrale arousal, met 5 bolletjes zit je voor jouw op de hoogste arousal. Deze metingen worden in de huidige app voor patiënten in een lijst weergegeven. Dit kan dus op een dag tot een lange lijst oplopen. Deze metingen worden gebaseerd op hartslag.
   = voorbeeld van de app laten zien =
   - Heeft u een idee van hoe deze hartslag samenhangt met emotie?
   - Hoe zou u deze bolletjes interpreteren en mee reflecteren?

Ik laat u nu een plaatje zien hoe een grafiek er uit zou kunnen zien van de hartslag van een patiënt gedurende dag (zie onderaan interviewschema).
   - Hoe zou u deze grafiek interpreteren?
   - Denkt u dat de app een goede weergave geeft van emotie onder de patiënten?
     o Zo nèe op eerste vraag: uitleg van additieve hartslag
       ▪ Hoe kijkt u hier tegenaan?

Requirement UCD/CEHRES
7. Metingen weergave
   Terug naar de app waar u de bolletjes ziet.
   - Welke metingen lijken het meest nuttigst voor u?
     o Hoge metingen? Lange tijd neutraal?
     o Perioden: dagelijks, maandelijks jaarlijks
     o Opmerkingen van patiënt erbij?
   - Hoe zou u de metingen gepresenteerd willen krijgen?
     o Tekst, lijst, grafiek, tabel?
     o Meldingen?
   - Vindt u dat de patiënt zelf mag kiezen wat er te zien is voor therapeuten?
     o Helemaal (niet), deels?
8. Vorm van systeem
- Wat voor soort product vindt u fijner
  o Computer
  o Smartphone app
  o Andere vorm: print outs etc.
    ▪ Waarom?

9. Taken van het systeem
Wanneer er een systeem voor therapeuten komt. Wat zijn dan uw verwachtingen?
- Wat verwacht u dat het systeem sowieso kan?
  o Hoe zou u dit willen zien?
- Wat voor verdere functies zou u nuttig vinden?
- Extra opties
  o Inzien van alleen eigen patiënten
  o Commentaar kunnen geven in de app
  o Vergelijkingsopties van een patient (bv van week tot week)
  o Schema met wie de meeste hoge emotionele spanningen heeft gehad (of juist minst)

10. Visuele weergave
Wanneer er een systeem komt is het belangrijk dat deze er duidelijk en overzichtelijk uitziet. Daarom volgen hier tot slot nog een aantal vragen over de visuele weergave.
- Vindt u opties tot personalisatie fijn?
  o Denk aan kleuren kunnen aanpassen, lettergrootte etc.
- Vindt u het fijn als het systeem overeenkomsten heeft met het GGNet systeem?
- Heeft u nog overige voorkeuren in visuele weergave?

11. Gebruik
- Wat vindt u het belangrijkste dat u ook daadwerkelijk met de Sense-IT zou willen werken?
  o Wat zou voor u een reden zijn er niet mee te gaan werken?

Dit waren alle vragen van het interview. Heeft u verder nog vragen of opmerkingen?
Dan wil ik hierbij hartelijk bedanken. (disclaimer) Ik wil hierbij melden dat we erg blij zijn met alle input die u gegeven heeft in dit interview. Echter wil ik u ook meegeven dat niet alles wat hier gezegd word in een keer gebruikt of geïmplementeerd komt worden. Wel nemen wij uiteraard al uw input mee om zo een zo goed mogelijke verdere ontwikkeling te maken in Sense-IT.

Wil u nog op de hoogte gehouden worden van het interview?
Zo ja: ...
Figure 1: Screenshot of an potential overview of a patient. It shows the measured heartbeat during one day.
Appendix B

App Sense-IT!: doorontwikkeling naar de kant van begeleiders

Geachte heer/mevrouw,

Wij vragen u bij te dragen aan een onderzoek naar de verdere ontwikkeling van de Sense-IT app. De Sense-IT app is bedoeld om patiënten te ondersteunen in het herkennen van emoties. Dit wordt gedaan door biosensoren van een smartwatch die gekoppeld wordt aan een de app op de telefoon. U beslist zelf of u wilt meedoen. Voordat u de beslissing neemt, is het belangrijk om meer te weten over het onderzoek. Lees deze informatiebrief rustig door. Heeft u na het lezen van de informatie nog vragen? Dan kunt u terecht bij de onderzoekers. Onderaan vindt u hun contactgegevens.

1. Wat is het doel van het onderzoek?

Zoals u waarschijnlijk weet wordt binnen Scelta, naast het bieden van behandeling, ook wetenschappelijk onderzoek gedaan. Dit onderzoek gaat over moeite met het (op tijd) opmerken en herkennen van eigen emoties. Het is bekend dat bij bepaalde psychische stoornissen mensen hier vaker dan gemiddeld moeite mee hebben. Een van die stoornissen is de borderline persoonlijkheidsstoornis.

Om mensen eerder hun emoties te laten opmerken, wordt de Sense-IT app verder ontwikkelt. In dit onderzoek wordt er gekeken of er ook een mogelijkheid is de informatie verkregen van de app te delen met hun begeleiders zodat zij ook eventueel inzichten krijgen of betere hulp kunnen aanbieden.

2. Hoe wordt het onderzoek uitgevoerd?

Er worden interviews gehouden waarbij deelnemers verschillende vragen van de interviewer beantwoordt. Dit zal ongeveer een uur duren. Dat kan in een keer, maar mocht het niet uitkomen dan kan dit ook in twee keer afgenomen worden. Dit interview zal, met uw toestemming, worden opgenomen met audioapparatuur en vervolgens anoniem behandeld worden.

3. Wat wordt er van u verwacht?

Als deelnemer wordt u gevraagd om de gestelde vragen naar uw mening te beantwoorden. Er zijn hierbij geen goede of foute antwoorden.

4. Wat zijn mogelijke voor- en nadelen van deelname aan dit onderzoek?

Het voordeel voor u is dat de uitkomsten van dit onderzoek zullen worden gebruikt voor de verdere ontwikkeling van de app, zoals deze er voor behandelaren uit komt te zien. Middels uw interview kunt u laten weten hoe u er over denkt, en daarmee invloed uitoefenen op hoe de app eruit komt te zien waarmee u later mogelijk zal gaan werken. Een nadeel is dat u er tijd aan kwijt bent. Dit zal ongeveer een uur zijn.

5. Wat gebeurt er als u niet wenst deel te nemen aan dit onderzoek?
U beslist zelf of u meedoet aan het onderzoek. Deelname is vrijwillig. Als u besluit niet mee te doen, hoeft u verder niets te doen en gebeurt er verder niks. Als u wel meedoet, kunt u altijd bedenken en toch stoppen. Ook tijdens het onderzoek.

6. Wat gebeurt er als het onderzoek is afgelopen?
Als uw deelname aan het onderzoek eindigt, hoeft u verder niets meer te doen.
Uw deelname eindigt als het onderzoek is afgelopen of als u besluit te stoppen met deelname. Ook stopt u deelname als de onderzoeker daar duidelijke redenen voor heeft (bijvoorbeeld niet komen opdagen of meewerken).

7. Wordt u geïnformeerd als er tussentijds voor u relevante informatie over de studie bekend wordt?
U wordt niet tussentijds geïnformeerd over eventuele relevantie informatie.

8. Wat gebeurt er met u gegevens?
De opgenomen interviews worden verder behandeld en verwerkt tot aanbevelingen voor Sense-IT. De gegevens worden hierbij geheel anoniem behandeld. Er wordt voor gezorgd dat direct na het onderzoek uw gegevens en antwoorden niet meer te herleiden zijn tot u als persoon. Uw antwoorden en gegevens worden anoniem nog wel bewaard voor 10 jaar. Dit is om mogelijk verder onderzoek te kunnen doen of om uitkomsten van het onderzoek te kunnen controleren.

9. Zijn er extra kosten/is er een vergoeding wanneer u besluit aan dit onderzoek mee te doen?
Er zijn geen extra kosten voor u. U krijgt aan de andere kant ook niet betaald voor deelname.

10. Welke medisch-ethische toetsingscommissie heeft dit onderzoek goedgekeurd?
Dit onderzoek is voorgelegd aan de Ethische Commissie van de Faculteit BMS van de Universiteit Twente. Deze commissie heeft bepaald dat dit onderzoek uitgevoerd mag worden.

13. Wilt u verder nog iets weten?
Voor verdere informatie over het onderzoek kun je contact opnemen met Liset de Bruin, masterstudent Universiteit Twente. E-mail: -
Of met Youri Derks, Gz-psycholoog en onderzoeker. E-mail: -

Dit is het einde van de informatiebrief.
Bedankt voor het doorlezen.

Liset de Bruin
Masterstudent Human Factors and Ergonomics, Universiteit Twente
E-mail:

Beste behandelaar,

Voor onderzoek binnen GGNET Scelta en de Universiteit Twente zijn Youri Derks en ik bezig met het verder ontwikkelen van Sense-IT (de mobiele app om emotionele gewaarwording te verbeteren bij patiënten). In het onderzoek gaan wij verder in om deze app ook bruikbaar te maken voor behandelaars.

Ik zal mij even voorstellen: Ik ben Liset de Bruin, ik ben student psychologie aan de Universiteit Twente. Sommige van jullie hebben mij vast wel eens rond zien lopen. Sinds december werk ik mee aan het (promotie)onderzoek van Youri Derks, ook wel bekend als project Sense-IT. Na eerst binnen dit project onderzoek te hebben gedaan naar een app voor patiënten, willen we nu onderzoeken op wat voor manier deze bij behandelaars gebruikt kan worden. Er zijn al eerder interviews gehouden met behandelaars, echter gaat dit onderzoek specifiek in op de doorontwikkeling naar de kant van de behandelaars. Dit onderzoek vormt tevens mijn afstudeeronderzoek binnen de master van de studie psychologie (Human Factors en Ergonomics).

Voor dit onderzoek zoeken wij respondenten die mee willen helpen aan het verder ontwikkelen van Sense-IT. Hiervoor wordt een eenmalig interview gedaan die ongeveer een uur zal duren. In dit interview worden verschillende thema’s besproken die van belang zijn voor het door ontwikkelen van Sense-IT. Zo wordt er ingegaan op hoe u over emoties praat met uw patiënten, maar ook voor een eventuele vormgeving van de begeleiders kant van de app.

Het onderzoek zal plaatsvinden begin mei. Wilt u mij laten weten of u wilt deelnemen aan het onderzoek? Dan kunnen we meteen een datum inplannen die u uitkomt. Voor meer informatie verwijs ik u naar de bijgevoegde informatiebrief . Daarnaast kunt u mij ook altijd een mail sturen via: L.deBruin@ggnet.nl of bellen naar 0625472841

We hopen erg op uw deelname! U draagt direct bij aan de voortgang van het onderzoek en de verdere ontwikkeling en implementatie van de Sense-IT app.

Alvast bedankt!

Met vriendelijke groet,

Liset de Bruin
Masterstudent Cognitieve Psychologie en Ergonomie Universiteit Twente,
Stagiaire GGNet Scelta
Appendix C

Toestemmingsverklaringformulier (informed consent)

Titel onderzoek: Ondersteunende app voor emotionele gewaarwording
Verantwoordelijke onderzoeker: Liset de Bruin

**In te vullen door de deelnemer**


Naam deelnemer: …………………………………………………………………………..
Datum: ……………..
Handtekening deelnemer: …………………………………………………

**In te vullen door de uitvoerende onderzoeker**

Ik heb een mondelinge en schriftelijke toelichting gegeven op het onderzoek. Ik zal resterende vragen over het onderzoek naar vermogen beantwoorden. De deelnemer zal van een eventuele voortijdige beëindiging van deelname aan dit onderzoek geen nadelige gevolgen ondervinden.

Naam onderzoeker: …………………………………………………………………………..
Datum: ……………..
Handtekening onderzoeker: …………………………………………………
### Appendix D

The following search strings were used:

**Scopus:** KEY("User Interface" OR Requirements OR Requirement OR Design OR Heuristics) AND (Therapists OR Treatment OR clinics OR counselors) AND (Platform OR App OR eHealth))”

**Science Direct:** key “(" User Interface " OR Requirements OR Requirement OR Design OR Heuristics) AND tak (Therapist OR treatment OR clinics OR counselors) AND tak(platform OR app OR eHealth)”.

Overview of the used literature in the literature study on user requirements for eHealth apps.

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Keywords</th>
<th>Year</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploring the needs of certified hand therapists regarding electronic applications</td>
<td>Short, N. LaRowe, J. Treherne, T. Francis, O. Garau, C. Schutt, M. Wei, C. Y</td>
<td>Hand therapy, Certified hand therapists, App, Technology</td>
<td>2016</td>
<td>Journal of Hand Therapy</td>
</tr>
<tr>
<td>Service experience design for healthy living support: Comparing an in-house with an eHealth solution</td>
<td>Simons, L. P. A. Felix Hampe, J.</td>
<td>eHealth, lifestyle intervention, health, experience design, motivation, design research, service design</td>
<td>2010</td>
<td>Bled eCommerce Conference</td>
</tr>
</tbody>
</table>
Appendix E

The following search strings were used:

Scopus: “KEY ( arousal OR emotion OR valence OR affect ) AND TITLE-ABS-KEY( "response coherence" OR "natural kinds" OR "emotional faculties")”

Science Direct: “KEY ( arousal OR emotion OR valence OR affect ) AND ( "response coherence" OR "natural kinds" OR "emotional faculties")”

Overview of the used literature in the literature study on emotion theory.

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Keywords</th>
<th>Year</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>The structure of emotion evidence from neuroimaging studies</td>
<td>Barrett, L. F.</td>
<td>Affect, Amygdala, Emotion, Neuroimaging</td>
<td>2006</td>
<td>Current Directions in Psychological Science</td>
</tr>
<tr>
<td>Emotion response coherence: A dual-process perspective</td>
<td>Evers, C.</td>
<td>Emotion Response coherence, Automatic responses, Reflective responses, Dual-process theories</td>
<td>2014</td>
<td>Biological Psychology</td>
</tr>
<tr>
<td>Searching for evidence, not a war: Reply to Lindquist, Siegel, Quigley, and Barrett</td>
<td>Lench, H. C.</td>
<td>Discrete emotion, Emotion elicitation, Emotion theory, Psychological construction</td>
<td>2013</td>
<td>Psychological Bulletin</td>
</tr>
<tr>
<td>The hundred-year emotion war: Are emotions natural kinds or psychological constructions? Comment on Lench, Flores, and Bench</td>
<td>Lindquist, K. A.</td>
<td>Construct validity, Emotion, Meta-analysis, Natural kinds, Psychological construction</td>
<td>2013</td>
<td>Psychological Bulletin</td>
</tr>
<tr>
<td>Don’t give up on basic emotions.</td>
<td>Scarantino, A.</td>
<td>Basic emotions, Core affect, Emotion primitives, Natural kinds, Psychological constructionism</td>
<td>2011</td>
<td>Emotion review</td>
</tr>
</tbody>
</table>
### Appendix F

<table>
<thead>
<tr>
<th>Dutch quote</th>
<th>Translated Quote</th>
<th>Theme</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: En dan vooral vanuit het lijf, lichaam</td>
<td>1: Mostly from the body.</td>
<td>Body</td>
<td>All therapist indicate to do something with coupling emotion to physical things. One therapy, BOP, is especially focused on that.</td>
</tr>
<tr>
<td>1: Daarmee leren ze als het ware ook koppeling te maken van, nouja, als er iets in het lijf, of als ik iets intensiever gaat gebeurd, gebeurd er ook iets in lijf.</td>
<td>1: They learn to make the connection of when something happens in the body, or when something intensive happens, something happens in the body.</td>
<td>Conclusion</td>
<td>Conclusion</td>
</tr>
<tr>
<td>2: Ja, soms wel. Er is nu bijvoorbeeld een cliënt daar zie je fysiek aan uh… aan de spierspanning bijvoorbeeld of veel slikken of uh… hele hoge schouders, dat er wat is zeg maar. En dan zijn ze vooral in het begin nog niet bewust van het feit dat er wat is. En dan zit het vooral in het, in het lijf.</td>
<td>2: Yes, sometimes. There is now a client for example that physical… you can see on the muscle tension or swallowing a lot or uh… very high shoulders, that something is up. And especially in the beginning they are not aware of this. And then it is mostly in the body.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3: En het verschil is dus dat het niet, dat een therapie is die aan het lijf is. Dus, dus alle problematiek uit zich ook in het lijf. In bijvoorbeeld in emoties in het lijf, in het lichamelijke signalen in het lijf.</td>
<td>3: And the difference is that it is not, it is a therapy that is focused on the body. So, problems are expressed in the body. In for example emotions in the body, in the bodily signals in the body.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5: Ja, dat zeker. En dan meest uitgesproken bij PMT

1: En ik hanteer heel simpel boos, bang, blij, bedroefd. Die vier emoties als kaders om in te werken

2: I: Oke, maar het wordt wel benadrukt dat ze in pannen of ook als gewoon boos, blij…

G: Ja, absoluut, ja juist! Ja we willen juist die normale taal uitspreken.

3: Ja, duiden. Heel erg duiden, adresseren van wat voel je, welke emoties, terug naar basis emoties

4: Ja, en ik denk zo ga als een cliënt wat verder in zijn proces of die heeft het al wat meer onder de knie uh… ja dan kun je wat verder dan die basisemoties en kun je daar wat meer differentiatie in aanbrengen

5: I: Of ook in de basisemoties? En dat is zoals blij, boos…

5: Yes, absolutely. Most explicitly in BOP

1: And I use very simple angry, scared, happy, sad. That four emotions as a reference to work with.

Emotion categories/basic emotion

Emotions get handled by calling it in terms of both pots as well as basic emotion categories

2: Interviewer: But it is emphasised to work in pots, or also as just angry, happy…

Interviewee: Yes, absolutely, yes! Yes we want just that: speaking the normal language.

3: Yes, indicating. A lot of indicating, addressing what you feel, which emotion, back to basic emotions

4: Yes, and I think when a client is further along the process or has mastered it already more uh… Then you can look beyond the basic emotions and bring some differentiation with that.

5: Interviewer: Also in basicemotions? Like happy, mad…

Interviewee: Yes.
<table>
<thead>
<tr>
<th>G: Allebei.</th>
<th>1: Ik nodig mensen in ieder geval uit om bij emotie stil te staan als ze er zijn. Dat ze de ruimte krijgen daar ook over te delen.</th>
<th>1: I invite people to stop for a moment and think about their emotion. That they get the room they need to share that.</th>
<th>Stopping at a moment</th>
<th>It is important for therapist to make the patients aware of emotions by letting them stay still</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:</td>
<td>Ik nodig mensen in ieder geval uit om bij emotie stil te staan als ze er zijn. Dat ze de ruimte krijgen daar ook over te delen.</td>
<td>1: I invite people to stop for a moment and think about their emotion. That they get the room they need to share that.</td>
<td>Getting space</td>
<td>One of the most important things is to give the patient space to out their emotions</td>
</tr>
<tr>
<td>2:</td>
<td>En uh… maar ook, ook die werkrelatie gewoon meer vertrouwelijk maken zeg maar zodat het ook veilig wordt om dat te doen.</td>
<td>2: And uh… but also, also the work relation, making it more trusting in a way that it feels safe to do that.</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3:</td>
<td>Ruimte geven dat het er mag zijn, maar ook grenzen te stellen, van uh… je mag wel boos</td>
<td>3: Giving space, but also stating boundaries, like uh… you can be angry but stay, stay with this.</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>
worden maar blijf dan, blijf erbij.

3: Allereerst door heel veel ruimte te creëren

4: Dus dat is eigenlijk eerst een beetje aftasten van oke hoe ver is die cliënt daarin. Uh… ze worden, we nodigen ze altijd uit om daarover te vertellen

<table>
<thead>
<tr>
<th>Step by step</th>
<th>Hard for most therapists, though mostly starts with giving space and starting with physical feelings.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Dat is heel… dat kan ik niet. Verschillend</td>
<td>1: That is… I cannot do that. Differs.</td>
</tr>
<tr>
<td>3: Allereerst door heel veel ruimte te creëren</td>
<td>3: First of all by creating a lot of space.</td>
</tr>
<tr>
<td>4: Uh… ja ik geloof dat ik, dat ik toch eerst zou vragen goh hoe zit je erbij, wat voel je? Waar, heb je ergens sensaties? Heb je last van je buik? Gaat je ademhaling snel? Heb je sweethanden? Dus daar zou ik denk ik vooral eerst naar vragen. Vervolgens naar gedachten. Welke gedachten spoken er door je hoofd? En ik denk, ja, ik denk aan de hand daarvan, kijk van, klopt het dat er mogelijk deze emotie daarbij hoort</td>
<td>4: Uh… yes I belief that I, that I first would ask how are you, what do you feel? Where, do you have sensations somewhere? Do you have stomach pain? Is your breathing rhythm high? Do you have sweaty hands? That is what I first would mainly ask about. Next about thoughts. Which thoughts are crossing your mind? And I think, when knowing that, like is it right that this possible emotion is connected to that.</td>
</tr>
<tr>
<td></td>
<td>Nou ja het zou, het zou met fysieke activiteit te maken kunnen hebben, dus dat is een stukje (...) En ik zou ook kunnen gaan kijken of er emotionele hobbels zijn geweest op die momenten.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2</td>
<td>Meer denk ik, meer meekijken een waarnemen. En uh. Ook kijken van wat er gebeurt dan. En hoe komt het dat je de vijf bolletjes hebt gekregen. En waarom heb je dan niet ingegrepen op het moment dat je drie of vier bolletjes had.</td>
</tr>
<tr>
<td>3</td>
<td>Ik zie niet of dit standaard normaal is of dat dit al...</td>
</tr>
<tr>
<td>4</td>
<td>Nou ja ik kan hier niet zien wat de hoogte is van de hartslag maar ik zou denken als ik hem zo mag interpreteren dat redelijk stabiel is (...) Ja ik zou wel graag willen weten wat deze pieken en dit dal heeft veroorzaakt. (...) nou ja ik denk ook dat het interessant is om te weten wat maakt dat</td>
</tr>
</tbody>
</table>
cliënten hier een stabiele hartslag heeft.

5: Nee… nee dat geeft totaal geen indicatie van hoe zo’n dag er uitziet. Geeft wel de indicatie dat de hartslag omhoog ging.

1: Ja, er vanuit gaande dat, dat uh… de hartslag alle emotionele componenten heel duidelijk aangeeft, dan denk ik van dat prima inzicht kan geven.

2: Ja. Maar dat zie je ook wel uh… terugkomen in die pannen die ze dan maken en dan, maar dat heb je zelf denk ik ook wel dat als je heel boos of heel erg blij of heel erg verdrietig dat je die hartslag ook, die gaat omhoog. Die kun je niet aansturen zomaar.

2: Uh… ik denk dat we vooral meer inzicht gaan krijgen.

3: En het gaat over hartslag en dat is tuurlijk, Indicating arousal All therapists indicated that heart rate and arousal are related, some even think a full linear relation.

3: Its’s mostly about heart rate and that is of course.
dat is direct gekoppeld aan arousal, ja leuk.

3: Ja, 100%. (…) Ja, ik denk dat daar een lineair verband tussen zit.

4: Dus ik denk dat er een 1 op 1 verband is tussen toenemende spanning en een verhogende hartslag.

5: Ja, over het algemeen hoe meer emotie hoe hoger de hartslag. (…) En volgens mij geld dat voor alle emoties. Dus zowel voor blijdschap als voor… verdriet. Ja verdriet? Ja ook denk ik, ja.

2: Nou we werken natuurlijk met de ERT. (…) En daarin brengen de cliënten wel zeg maar hun emoties in kaart en de heftigheid, zeg maar.

2: Ja we gaan meer nu werken via die schematherapie.

3: Uh… ik heb niet een module of een product dat ik gebruik.

2: Well we work with the ERT of course. (…) And within the clients indicate the intensity of their emotion, so to speak.

2: Yes, we work now more with “schematherapie”.

3: Uh… I do not have one module or a product that I use.

3: And we do have the reference of

Methods
There are a few methods that are used. However, within those methods there is a lot of room for interpretation. Some therapists use more components of these methods than others.
3: En we hebben wel het kader van de schematherapie. Dus dat is ja, dat is wel een kader waarbinnen we werken. Maar we hebben geen, nu niet een vaste lijn product.

4: Nou wat we in ieder geval doen is dus de ERT, of de VERS dat kan ook (…)k merk dat ik daar zelf wel veel gebruik van maak, ook al noem ik het niet eens zo maar ook in de therapie, maar ook in de individuele contacten grijp ik daar eigenlijk wel naar terug.

5: Uh… nou verschillend, belangrijk is denk ik dat, we hebben een VERS dus een emotie regulatie training, en daar wordt patiënten geleerd om de spanningsopbouw te herkennen.

2: Ja, hoe gaan we daar mee om? Vooral door vragen.

2: Doorvragen, maar ook weer uh… teruggaan naar wat voor gedrag zien we.

2: Yes, how do we handle that? Mainly by keep asking questions. Keep asking questions, but also uh… return to what behaviour we actually see, or how do

alexithymia

From different functions there are different ways to start with patients suffering from alexithymia. Most of all it is creating space, but also giving
<table>
<thead>
<tr>
<th>Dutch</th>
<th>English</th>
<th>Dutch</th>
</tr>
</thead>
<tbody>
<tr>
<td>nou eigenlijk, of hoe reageer je in bepaalde situaties, maar ook wel, ook wel voordoen.</td>
<td>you react in certain situations, but also, sometimes, act it out.</td>
<td>psycho education on emotion or starting with asking a questions on physical feelings.</td>
</tr>
<tr>
<td>3: Allereerst door heel veel ruimte te creëren</td>
<td>3: First of all by creating a lot of space.</td>
<td></td>
</tr>
<tr>
<td>4: Ja, uh… mijn inzien is vooral dan op sensaties af te gaan van oh wat voel je, wat bemerk je bij jezelf, welke gedachte spelen een rol? Omdat je vaak aan gedachten ook wel kunt herleiden of dat daar een boosheid in zit of misschien juist verdriet bijvoorbeeld. En lichamelijk sensaties om, om ze ook vertrouwen leren te worden met wat ze voelen en wat daar dan bij hoort</td>
<td>4: Well, uh… my take on it is mostly on sensations, like oh what do you feel, what do you notice, which thoughts play a role? Because most of the time thoughts can give an indication if there is anger for example, or maybe sadness. And physical sensation, to learn them to trust what they feel and to which that belongs.</td>
<td></td>
</tr>
<tr>
<td>5: Nou ja, in eerste instantie wordt denk ik met de client besproken wat het belang is, dus een stuk psychoeducatief van wat, wat ja, wat mij betreft hoeven ze helemaal niet hun emoties te herkennen en er ook niet over te praten maar ik denk vaak zit dat hun in de weg zeker</td>
<td>5: Well, initially I think it is discussed with the client why it is important, so a bit of psycho education, of well, for me they do not have to recognise their emotions and also not talk about it but I think for them that is usually something that interferes, certainly when they cannot talk about it, it has many</td>
<td></td>
</tr>
</tbody>
</table>
als ze er niet over kunnen praten geeft veel gevolgen, als ze het niet herkennen heeft heet ook gevolgen, voor hunzelf en ook voor anderen, ook voor een baan. Voor allerlei dingen.

consequences, or if they cannot recognise it has consequences as well. For themselves as well as for others, also for a job. For all kind of things.
## Appendix G

<table>
<thead>
<tr>
<th>User expression</th>
<th>Value</th>
<th>Attributes</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: (about the picture presented) Yes, I like this. It gives more of a total overview.</td>
<td>Quick overview</td>
<td>Graph overview</td>
<td>The system should be able to give an clear overview in a graph</td>
</tr>
<tr>
<td>2: Yes, I just find it a good display of the structure of the tension. I think that’s what it is about</td>
<td>Quick overview</td>
<td>Graph overview</td>
<td>The system should be able to give an clear overview in a graph</td>
</tr>
<tr>
<td>3: Yes such graph is I think… It’s of course about not spending too much extra time on it but that you can have a sort of overview with the client</td>
<td>Quick overview</td>
<td>Graph overview</td>
<td>The system should be able to give an clear overview in a graph</td>
</tr>
<tr>
<td>4: Well at least what you showed me on the picture is nice, of a day. Actually uh… where are the peaks and the descents.</td>
<td>Quick overview</td>
<td>Graph overview</td>
<td>The system should be able to give an clear overview in a graph</td>
</tr>
<tr>
<td>5: I think a graph is very useful. Gives the most overview. Put the time with it.</td>
<td>Quick overview</td>
<td>Graph overview</td>
<td>The system should be able to give an clear overview in a graph</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>User expression</th>
<th>Value</th>
<th>Attributes</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: For me it is no different than it is now. The client shares what it wants to share or can share or thinks the therapist of group can handle.</td>
<td>Patient is responsible</td>
<td>Responsibility and sharing</td>
<td>The system must let the patient decide which information to share.</td>
</tr>
<tr>
<td>2: Uh… but then again, the client, still must want to give insights.</td>
<td>Patient is responsible</td>
<td>Responsibility and sharing</td>
<td>The system must let the patient decide which information to share.</td>
</tr>
<tr>
<td>3: (about which information to share) I think that’s own responsibility</td>
<td>Patient is responsible</td>
<td>Responsibility and sharing</td>
<td>The system must let the patient decide which information to share.</td>
</tr>
<tr>
<td>3: Thus someone chooses what he or she makes available, like in our system,</td>
<td>Patient is responsible</td>
<td>Responsibility and sharing</td>
<td>The system must let the patient decide which information to share.</td>
</tr>
</tbody>
</table>
which documents we make available to clients, that they can see it.

4: Interviewer: Would it be useful if that would be send once a week to the therapists?
Participant: Yes, I’m not sure, we work here with the principle that the responsibility is with the client.

5: Interviewer: Do you think that the patient can choose what information he or she shares?
Participant: Yes most certainly.

<table>
<thead>
<tr>
<th></th>
<th>A smartphone would be for me… At least it is compact and easy to use.</th>
<th>Easy to use</th>
<th>Technical product</th>
<th>The platform for therapists should be available on multiple devices (smartphone, laptop, tablet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>It would be nice if it could be linked to the EPD, just with a click. I: Just on the computer…</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Thus that you can, for instance, take a tablet and can look at it together.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>(about usefulness tablet or pc) Yes that would be useful. Or that they can easily make a printout. Yes, because watching a smartphone with two people is not that handy.</td>
<td></td>
<td></td>
<td>The system should be able to make printouts easily</td>
</tr>
<tr>
<td>5</td>
<td>Interviewer: Is it useful to show it on the laptop or tablet instead of being on a smartphone together? Participant: Yes, I think so.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1: That it works. Easy access When to use it  

The system should work properly

3: (about when to use it) Well the facility’s I think (…) that it works well. That you have it in storage, that uh… that it is usable, thus it is really facilitated for you and you can easily make use of it.

3: (about when to use it) Also that it becomes a more integral part. Thus it belongs to something.

4: And uh… I think it’s mostly complementing what we already do with ERT.

<table>
<thead>
<tr>
<th>1: That line indicates things in which you should have the possibility to make some notes.</th>
<th>Easy to use</th>
<th>Commenting in app</th>
<th>The system should allow the therapist to make notes in the application.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3: Interviewer: And… for example making notes for yourself that not necessary get shared with uh… Participant: Yes, that seems useful to me.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5: Yes because in discussion you can get to new insight, new ideas. Then it’s nice to be able to write them down.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1: (about a comparing option) Yes. Quick overview Comparing</th>
<th>The system should be able to compare different days or weeks to each other</th>
</tr>
</thead>
<tbody>
<tr>
<td>That is… no, yes that would be very nice.</td>
<td></td>
</tr>
</tbody>
</table>
2: Yes, if you could compare daily you could look if a certain pattern exists. That would be nice.

3: That every time uh… has the same pattern, than it would be nice that you can see that.

3: (about comparison) I think it would be cool, yes I think it would be nice if the system indicates it.

4: That you quickly can recognise a pattern in behaviour or in situations or uh… in an increased heartrate.

4: Well I would like it if the system could give an alarm at a certain point or something alike, or create a week overview stating for example that it saw that at 3 times at 10 o’clock the heart rate was high and at 7 o’clock four times this week the heart rate was low, but I am not sure if the app… if the watch is responsible for that. But it should stay a topic for therapy.

5: (about comparison) Yes, most certainly. Then you can discover patterns. If the system does it, it’s nice.

1: But not as much as in a comparable way uh… one, two, three, four, vife, six, seven, eight, nine.

The system should recognise patterns in heartrate

Quick overview
Comparing of patients
The system should not compare patient to each other.
1: (about personalisation) No, no. For me that would be, no, for me no. No.

3: (about personalisation) With all those things it is like the more options you have, the more you want. Well, you have to make a choice in that, yes fine. I think both is fine, I do not really have a preference (for personalisation)

4: (about personalisation) Oh no, that’s not necessary for me.

| 1: Yes, when things can connect to other (GGNet system), that would have my preference. | Neutral visualisation | Personalisation | The system does not have to provide options for personalisation |
|---|---|---|
| 2: It would be nice if it could be linked to the EPD, just with a click. I: Just on the computer… | Easy access | GGNet | The system should be integrated in the GGNet system |
| 2: (About integration GGNet) Yes, yes that would be nice. | | | |
| 2: Yes that would be nice. A separate app is also fine but you are already changing a lot from one programme to another so it would be nice if it could all go a bit more together. | | | |
| 3: No, not necessary. I will find out how it work when it is different. And I think that the GGNet system not necessary uh.. it’s not bad but it’s not that good either. | | | |
4: Uh… well it would be easy if it is easily accessible for example via intranet, that you can just click on an icon and it opens the app.

5: Yes, that is easier, otherwise you need to switch to another environment and that’s more difficult

1: If it is too difficult for me or for the clients. That they work too much with the device.

3: Well. If you get frustrated over… yes that it just won’t nail it. Or you can’t get the information out of it that are relevant to you, so for example that you don’t have an overview, that it’s a maze of things, that you keep puzzling, that it makes no sense to you… That’s what I think

1: And so yes, I can imagine that you can put a lot of thing in it, however I think that makes it too complicated.

2: I think the list itself. Because, as far as I know, all people that are here experience those peaks. I think it would be nice for clients to see that there are not only peaks.

2: And uh… that you just, you can repeat those peaks again and again but it’s not all about those peaks.

<table>
<thead>
<tr>
<th>Easy to use</th>
<th>Not work with the system</th>
<th>The system should be easy to operate</th>
</tr>
</thead>
<tbody>
<tr>
<td>General system</td>
<td>Both show the progress of the peaks and declines</td>
<td>The system should show single days as well as week overviews.</td>
</tr>
</tbody>
</table>
3: I think the most useful thing is that you don’t get information from everybody, that seems too much to me.

3: That you ask clients for example if they can pick one or two days that were characteristic or very problematic, or one that was very average or something like that.

3: And not only… a moment. Thus you try, the clients are mostly pretty focused on one event and not on the whole progress

4: Uh… well a week overview would be nice.

5: I think a peak is not enough for me and the client. I think it’s good when a client notices what happens in a day and also a week. I think that’s useful too.

5: I think a day is not enough, so a day and a week.

2: I would prefer to watch with the client.

3: Thus that you can, for instance, take a tablet and can look at it together.
5: I think the Sense-IT alone is not enough, I think it’s useful to do it together.

2: Uh… well. I would prefer to talk to a client in person. Otherwise the contact turns out really strange.

3: Because then it will turn out to be very digital in the end.

4: And I really do not want to put something in there from a distance. I prefer to return things in a conversation.

<table>
<thead>
<tr>
<th>2: No, I think it should stay neutral.</th>
<th>Neutral visualisation</th>
<th>The system should have a neutral appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too cheery, I think, would look a bit like a game. But uh… only black and white would be a bit too heavy.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3: I think, with all self-reports included.</th>
<th>Quick overview</th>
<th>Self-reports</th>
<th>The system should include the self-reports of the patient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>The system should make the self-reports of the patient</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>easy to find in the graph</td>
</tr>
</tbody>
</table>

3: Yes just, yes, that it can give an overview. And with that, that you can read what someone wrote with it.

4: Uh… yes. Because you want to know what happened. Uh… but a function with what they applied. Did they apply something or did they apply destructive behaviour or something good?

4: Pfoe… uh… well as I said before that for example you have a graph with the circles and that you can click on
such a circle to directly see what a patient has filled in. I think I would find that useful.

5: (about seeing patients comments):
Yes, that is useful for both the client as for me to look back at that. Because the client can’t remember everything.
### Appendix H

<table>
<thead>
<tr>
<th>Dutch quotes</th>
<th>Translated Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Participant 1</strong></td>
<td></td>
</tr>
<tr>
<td>Wat ik interessant vind om bij wijze van spreken in die PMT zelf te kunnen gebruiken</td>
<td>What I find interesting is to use it in the BOP itself.</td>
</tr>
<tr>
<td>Ja, in dat uur van waar… wat maakt dat daar die pick zit, kun je dat terughalen?</td>
<td>Yes, in that hour (of BOP)… Why is the peak there, can you recall that moment?</td>
</tr>
<tr>
<td>Ja, dit spreekt mij wel aan. Het geeft in ieder geval wel ja grote lijnen aan.</td>
<td>(about the picture presented) Yes, I like this. It gives more of a total overview.</td>
</tr>
<tr>
<td>Voor mij is het niet anders dan, dan nu. Client deelt dat wat ie wil delen of wat ie kan delen of waarvan die het idee dat de therapeut of de groep aankan.</td>
<td>For me it is no different than it is now. The client shares what it wants to share or can share or thinks the therapist of group can handle.</td>
</tr>
<tr>
<td>zo’n smartphone wat mij betreft al… dat is in ieder geval compact en makkelijk te gebruiken</td>
<td>A smartphone would be for me… At least it is compact and easy to use.</td>
</tr>
<tr>
<td>Dat het werkt.</td>
<td>That it works.</td>
</tr>
<tr>
<td>Dat lijntje dat geeft dingen aan waarbij je eventueel mogelijkheid hebt om wel wat aantekeningen te kunnen maken.</td>
<td>That line indicates things in which you should have the possibility to make some notes.</td>
</tr>
<tr>
<td>Ja. Dat is… nee, ja dat zou heel mooi zijn</td>
<td>(about a comparing option) Yes. That is… no, yes that would be very nice.</td>
</tr>
<tr>
<td>maar dan niet zo zeer in de vergelijkende zin van uh… een twee drie vier vijf zes zeven acht negen</td>
<td>But not as much as in a comparable way uh… one, two, three, four, five, six, seven, eight, nine.</td>
</tr>
<tr>
<td>Nee, nee. Dat zou voor mij, nee, dat zou voor mij nee. Nee.</td>
<td>(about personalisation) No, no. For me that would be, no, for me no. No.</td>
</tr>
</tbody>
</table>
Ja, als dingen kunnen aansluiten dan heeft dat wel voorkeur

Yes, when things can connect to other (GGNet system), that would have my preference.

of als het voor mij te ingewikkeld is, of voor de cliënten te ingewikkeld is, dat er, dat ze met het apparaat bezig zijn

If it is too difficult for me or for the clients. That they work too much with the device.

En dus niet ja, ik kan me voorstellen dat je er van alles en nog wat erin kan stoppen maar dan denk ik, dat dat het te ingewikkeld maakt.

And so yes, I can imagine that you can put a lot of thing in it, however I think that makes it too complicated.

**Participant 2**

Ja vind ik gewoon mooi weergave van je opbouw in je spanning. Ik denk dat het daar over gaat.

Yes, I just find it a good display of the structure of the tension. I think that’s what it is about.

Ik zou het liefst, zelf het liefst willen meekijken met die cliënt.

I would prefer to watch with the client.

Uh… maar dan nog moet ie, moet die cliënt, het inzicht willen geven

Uh… but then again, the client, still must want to give insights.

Ik denk, ik denk wel de lijst zelf. Want, volgens mij, alle mensen die hier zitten ervaren die pieken, ik denk juist dat het heel mooi werkt voor die cliënt om ook te zien dat die pieken er niet alleen maar zien.

I think the list itself. Because, as far as I know, all people that are here experience those peaks. I think it would be nice for clients to see that there are not only peaks.

G: Het zou wel fijn zijn als het gewoon aan het EPD is gekoppeld. Gewoon een klikje. I: Gewoon op de computer…

G: It would be nice if it could be linked to the EPD, just with a click. I: Just on the computer…


(About integration GGNet) Yes, yes that would be nice.
Uh… nou. Dat zou ik liever gewoon doen in het gesprek met de cliënt. Anders wordt het, dan krijg je heel raar contact ja, als je daags zou kunnen vergelijken, kun je ook kijken of er een bepaald patroon in zit. Dat zou wel mooi zijn ja

Ja zou wel fijn zijn. Kijk en losse app is ook prima hoor, maar je bent van zoveel van het ene programmatje naar het andere programmatje naar dat andere programmatje, dus het zou mooi zijn als het allemaal wat meer samen gaat.

Nee. Ik denk dat het vooral neutraal moet blijven en uh… een te vrolijk, denk nee, dan lijkt het wel een beetje een spelletje. Maar ook uh… heel zwart wit wordt ook weer een beetje zo zwaar denk ik

En uh… niet dat je, datje gewoon wel, je kan die pieken blijven benoemen maar het gaat niet alleen over die pieken.

Participant 3

ik denk dat het handigste is dat je, ik denk niet alle informatie krijgt van iedereen, dat lijkt me te gek Maar dat je bijvoorbeeld cliënten vraagt van joh, kan je ze… kan je een of twee dagen eruit pikken dat die voor jou… kenmerkend waren of een heel problematisch was of een die heel gemiddeld was ofzo, ik noem maar iets.

Vooral veel, ik denk ook echt wel met zelfrapportage erbij

I think the most useful thing is that you don’t get information from everybody, that seems too much to me.

That you ask clients for example if they can pick one or two days that were characteristic or very problematic, or one that was very average or something like that.

I think, with all self-reports included.
Ja zo’n grafiekje denk ik wel dat… kijk het gaat er natuurlijk over dat je niet heel veel extra tijd in kwijt bent maar dat je wel met de cliënt eigenlijk een soort overzicht kan hebben.

Dus dat je weet ik veel dat je samen een tablet kan pakken en kan zeggen nou zullen we eens even kijken.

En niet alleen maar uh… een moment zeg maar. Dus dat je probeert eigenlijk, die cliënten zijn toch vaak wel heel gefocust op een gebeurtenis maar niet op het verloop.

Eigen verantwoordelijkheid vind ik dat. Ja gewoon, ja dat, dat het overzicht kan geven. En dat het, dat je kan lezen wat iemand erbij schrijft

Dat elke keer dezelfde uh… volgens hetzelfde patroon verloopt dat zou natuurlijk wel mooi zijn als je dat kunt zien

maar ik vind het ook wel tof als het, ja ik denk dat het ook wel mooi is als het systeem iets aangeeft (about comparison) I think it would be cool, yes I think it would be nice if the system indicates it.

Met al die dingen is het zo, hoe meer keuze opties je hebt, hoe veelisender je ook van wordt he. Hoe ja, dan moet je daar ook keuze in maken, ja prima. Ik vind het allebei prima, maar heb echt geen voorkeur. (about personalisation) With all those things it is like the more options you have, the more you want. Well, you have to make a choice in that, yes fine. I think both is fine, I do not really have a preference (for personalisation)

Nee, hoeft van mij niet. Ik kom er wel uit denk ik als het iets anders is. En ik denk dat het GGNet... (for personalisation) No, not necessary. I will find out how it work when it is different. And I think that the
systeem niet per se uh… heel hinderlijk, maar ik vind het ook niet superfijn ofzo

GGNet system not necessary uh.. it’s not bad but it’s not that good either.

Dus dat iemand kiest wat iemand beschikbaar maakt, zoals wij in ons systeem, welke documenten we beschikbaar maken voor cliënten, dat ze het kunnen inzien.

Thus someone chooses what he or she makes available, like in our system, which documents we make available to clients, that they can see it.

Want dan krijg je ook weer, dat het, dan wordt het wel heel digitaal van

Because then it will turn out to be very digital in the end.

Interviewer: And… for example making notes for yourself that not necessary get shared with uh…
Participant: Yes, that seems useful to me.

Nou de facilitering denk ik (…) dat het goed werkt. Dat je het op voorraad hebt, dat je uh… dat het is handzaam is weet je wel, dus dat het echt voor je gefaciliteerd wordt dat je er makkelijk mee kan werken.

(about when to use it) Well the facilites I think (…) that it works well. That you have it in storage, that uh… that it is usable, thus it is really facilitated for you and you can easily make use of it.

En ook dat het wat meer een soort integraal onderdeel wordt ofzo. Dus dat het ergens bij hoort.

(about when to use it) Also that it becomes a more integral part. Thus it belongs to something.

Nou ja. Als je, als je gefrustreerd raakt over… ja dat het, dat het gewoon niet goed raakt. (…) of dat je geen, dingen eruit kan halen die voor jouw relevant zijn, dus bijvoorbeeld dat je er geen overzicht op hebt, dat het een wirwar is, dat je zit te puzzelen, dat het je niks zegt… Dat denk ik

Well. If you get frustrated over… yes that it just won’t nail it. Or you can’t get the information out of it that are relevant to you, so for example that you don’t have an overview, that it’s a maze of things, that you keep puzzling, that it makes no sense to you… That’s what I think.
Participant 4

nou ja in ieder geval wat je op het plaatje liet zien volgens mij is dat wel fijn, van een etmaal. Eigenlijk uh… waar zitten de pieken en waar zitten de dalen.

dat dat je snel een, een patroon kan ontdekken in gedragingen of in situaties of uh… in een verhoogde hartslag

Well at least what you showed me on the picture is nice, of a day. Actually uh… where are the peaks and the descents.

That you quickly can recognise a pattern in behaviour or in situations or uh… in a increased heartrate.

Uh… ja. Want je wil weten wat is er gebeurd. Uh… maar ook een functie met wat hebben ze ingezet. Hebben ze iets ingezet, of hebben ze misschien destructief gedrag ingezet of hebben ze juist iets goeds ingezet

Uh… yes. Because you want to know what happened. Uh… but a function with what they applied. Did they apply something or did they apply destructive behaviour or something good?

Well I would like it if the system could give an alarm at a certain point or something alike, or create a week overview stating for example that it saw that at 3 times at 10 o’clock the heart rate was high and at 7 o’clock four times this week the heart rate was low, but I am not sure if the app… if the watch is responsible for that. But it should stay a topic for therapy.

I: en zou dat dan ook nog handig zijn dat dan een keer per week naar de therapeuten wordt gestuurd?
G:Ja, dat weet ik niet zo goed, ja wij werken hier heel erg met dat de verantwoordelijkheid bij de cliënt in principe ligt.

Ja, dat zou wel handig zijn. Of dat ze heel makkelijk een uitdraaitje kunnen maken. Ja, want

I: Would it be useful if that would be send once a week to the therapists?
G: Yes, I’m not sure, we work here with the principle that the responsibility is with the client.

(about usefulness tablet or pc) Yes that would be useful. Or that they can easily make a
met zijn tweeën op een smartphone werken dat is
dan misschien niet zo heel erg handig.

Pfoe… uh… nou ja wat ik net al zei als je
bijvoorbeeld al een grafiek hebt waarin dan
bolletjes staan en dat je zo’n bolletje kunt
aantikken en dat gelijk daar een vakje naast
verschijnt van hey wat heeft de cliënt daar
ingevuld. Volgens mij zou, zou ik dat wel handig
vinden..

Uh… nou ja een weekoverzicht zou ik wel fijn
vinden

En ik zou daar helemaal niet vanaf afstand iets in
willen zetten. Want ik ben wel heel erg voor om in,
om in gesprek dingen terug te geven

Oh nee, hoeft van mij echt niet.

Uh… nou ja het zijn wel makkelijk zijn als het dan
gewoon eenvoudig toegankelijk is bijvoorbeeld via
intranet, dat je gewoon op een icoontje kan klikken
en dat je dan in de app komt als het waren

En uh… ik denk dat het vooral een aanvulling is op
de, op de ERT die wij al doen

And uh… I think it’s mostly complementing
what we already do with ERT.

**Participant 5**

Nee een piek heb ik niet zo veel aan en de cliënt
ook niet denk ik. Ik denk dat het goed is als de
cliënt merkt hoe het verloop is van een dag maar
ook een week. Vind ik ook wel handig.

I think a peak is not enough for me and the
client. I think it’s good when a client notices
what happens in a day and also a week. I think
that’s useful too.
Een dag is net iets te weinig, dus ik denk een dag en een week.

I: Is het dan handig dat het dan ook nog bijvoorbeeld op een tablet of een laptop kan worden gezet in plaats van dat je het met zijn tweeën op een mobiel zit? G: Ja vind ik wel.

Jawel, dat is zeker handig. Want ik denk zowel voor de cliënt als voor mij is het handig om samen daar even naar terug te kijken. Want die heeft ook niet meer alles paraat.

Ik vind zo’n grafiek vind ik wel heel erg handig. Vind ik het meest overzichtelijke. Tijd erbij, ja.

I: Oke, en vind u dat de patiënt zelf mag kiezen welke informatie hij of zij deelt? G: Ja zeker.

Ja want je kunt denk ik toch al overleggende kun je toch ook nieuwe inzichten, nieuwe ideeën komen. Ja dat is wel heel prettig dat je iets erbij kan zetten.

Ja, zeker zeker. Kun je patronen ontdekken (…)Nou het systeem is mooi toch.

Ja, dat is makkelijker, anders moet je weer naar een andere omgeving en das lastiger

Daar is zo’n Sense-IT alleen niet genoeg voor, ik denk dat het wel handig is dat je dat samen doet.

I think a day is not enough, so a day and a week.

Interviewer: Is it useful to show it on the laptop or tablet instead of being on a smartphone together?

Participant: Yes, I think so.

(about seeing patients comments): Yes, that is useful for both the client as for me to look back at that. Because the client can’t remember everything.

I think a graph is very useful. Gives the most overview. Put the time with it.

Interviewer: Do you think that the patient can choose what information he or she shares?

Participant: Yes most certainly.

Yes because in discussion you can get to new insight, new ideas. Then it’s nice to be able to write them down.

(about comparison) Yes, most certainly. Then you can discover patterns. If the system does it, it’s nice.

Yes, that is easier, otherwise you need to switch to another environment and that’s more difficult

I think the Sense-IT alone is not enough, I think it’s useful to do it together.