**Home-based VRET (CATCH) Personas**

**Persona #1**

- Name: Martijn

- Nationality: Dutch

- Male, 60 years old

- Bellow average computer skill

*(asking “Helpdesk” for help)*

- Hardware: PC with large screen

- Does not like reading things over

*(eCoach video will help him)*

- Motivated to do the “Home” treatment

- Average self-efficacy

- Married

- Status: looking for a job

- Goal: wants a new job 🡪 doing good at job interview



**Persona #2**

- Name: Heidi

- Nationality: Dutch

- Female, 25 years old

- Average computer skill

- Hardware: laptop and large HD TV

- Like typing and reading

(*eCoach will help her a lot*)

- Motivated to do the “Home” treatment

- Average self-efficacy

- Single

- Status: business economic university student

- Goal: good at presentation class

**Persona #3**

- Name: Li hua

- Nationality: Chinese (speak Dutch fluently)

- Female, 40 years old

- Very good computer skill

- Hardware: laptop and projector

- Busy woman: job and family

- Married and have 3 children

- Motivated to do the “Home” treatment

- Low self-efficacy

- Status: Sales person at IT Company

- Goal: no anxiety at job (dealing with customers)

**Home-based VRET (CATCH) Scenarios**

*(Please refer to CATCH scenario block diagram)*

*After being diagnosed with social phobia, [Martijn] [Heidi] [Li Hua] have agreed to a home-based VRET therapy. They meet with Sophie their therapist at the clinic to get started with this therapy.*

[*in the clinic*]

**Home-based VRET system Introduction Module (Block 1):**

Martijn meet Sophie in the clinic. Here, Sophie gives a general overview of the CATCH system, how to interact with the eCoach system, followed by showing him a video demonstration about home-based VRET system (CATCH). Sophie also introduces him the CATCH “helpdesk” members. Sophie then called one of the “Helpdesk” members, named Isabel. Isabel talks and explains to Martijn that she will offer technical support in order to help him if he has a problem regarding the CATCH system (e.g setup, installation, etc.).

Looking at the promising system and good “Helpdesk” services, Martijn agreed to give the home treatment via CATCH system a try. Sophie then registered Martijn into the system by entering Martijn’s personal detail. To ensure the patient’s data security, Sophie generate special encryption-decryption key in the USB stick, as well asking Martijn to set a password to enter the CATCH system later. Finally, before going home, Martijn receives a secure USB stick, a heart rate monitoring device, Bluetooth receiver, DVD pack contains the CATCH system to be installed to his own system and paper installation manual of the CATCH system including a troubleshooting help guide, and the contact number and email of the “Helpdesk” team members.

**Claims:**

1. *Face-to-face* demo contribute to patient’s self-efficacy of being able to do the treatment at home. Moreover, with this demo session, the patient is able to develop a general understanding about how to setup and interact with CATCH system.
2. Having the patient talk on the phone to a “Helpdesk” team member makes it more likely that the patient will contact the “Helpdesk” when he/she has a technical problem at home (via Phone and e-mail.)

**Home-based VRET system installation Module (Block 2):**

[*at home*]

Since Martijn does not have good computer skills, after a view attempt, he still cannot manage to get the CATCH system running properly. He calls Isabel from the help desk asking for help. Isabel enquires about his problem, and then step-by-step guided him through the installation process. Isabel also guide him how to plug-in the Bluetooth device in the correct USB port and setup the connection of the heart rate monitoring device with the CATCH system. After this the CATCH system is running properly on his computer that is equipped with a large screen. Isabel also reminds him that CATCH installation manual also offers instructions on the sitting and viewing position in order to maximize his presence experience.

*[Another story]*

Heidi does not have a problem with the installation. The CATCH system is quickly up and running on her laptop. Since her laptop is only equipped with 13 inch screen and to maximize the presence experience, she connects her laptop to a large High Definition (HD) television. The CATCH system manual also offers the guidance to the sitting and viewing position in order to maximize the presence experience even further.

*[Another story]*

Li Hua: Since the installation manual of the CATCH system is quite straight forward and easy to follow, and she has good computer skill, therefore she had not difficulty to setup the system. The manual also offer guidance in order to maximize the presence experience. She has a wide projector, so she connects her projector to her laptop in order to maximize the presence experience. View minutes later, her CATCH system is up and running on her computer with large projector screen.

**Claims:**

1. Patient can setup CATCH system on their own system or if needed with the help of helpdesk.
2. With instruction of the eCoach (e.g. siting and viewing position, using large TV screen, using projector, etc.), patients can maximize the presence experience.

**Home-based VRET Treatment Plan Module – Session #1** (**Block 3+4):**

Martijn adjust his sitting and viewing position following thereby the instructions in the CATCH manual. Then he inserts his USB stick into the computer and starts the CATCH eCoach application. The eCoach login window pops up and he types in his username and password for the system. After the process of verification and security check is completed successfully, the main CATCH eCoach user interface appears.

First, the eCoach greets him and gives him a “computer skill setting” option window in order to personalize the interaction with his computer base on his skill level (e.g. more detailed instructions and reminder each time user use the system, or one time instructions with option look for more help when needed).

Then, the eCoach starts discussing with Martijn about the goals of the therapy and asks him to indicate his desired treatment outcome. Martijn select from a set of predefined categories *professional interviews* as the type of interactions he likes to be able to do. After this the eCoach shows Martijn a video, in which a therapist explains exposure therapy and the rationale behind it. When the video finishes, the eCoach returns back on the screen and explains to Martijn to create a personalized treatment plan, in which the therapist at the clinic needs some information from him.

First the eCoach asks Martijn to rate a number of social events on the amount of anxiety this would evoke. The eCoach used this rating to make a draft hierarchy of social situations Martijn fears, and present this to Martijn. The eCoach asks whether this hierarchy is correct, or if he likes to change things. After this step, the eCoach explains to Martijn that people with social phobia often use tricks to avoid fearful situations or do things to make easier to cope with social situation. The eCoach shows Martijn a list with tricks people often use and ask him to indicate which one he also used, or to enter new one if they are not in the list. Finally, the eCoach asks Martijn to write down his availability in the next four weeks in which he likes to do this therapy. The eCoach thanks Martijn for sharing all this information with him. He explains that the therapist in clinic will use it to create the treatment plan. Martijn remembers that Sophie had promised that she would make this treatment plan within two working days once he had given this information to the eCoach. The eCoach explains that this ends the first session and reminds Martijn to remove the security USB stick and to store it somewhere safe.

*\*one day later\**

At the clinic, Sophie log-in into her eCoach system. She is notified by the system that Martijn already completed his introduction session. Then, she looks at the information provided by the system (e.g. Martijn’s treatment goal, his anxiety hierarchy, his safety behaviours, his schedule, etc.). Based on this information, Sophie creates a treatment plan for him. From a list of social scenarios, she selects the ones Martijn will be exposed to. Based on the hierarchy information, she also indicates the order of the exposure. She also indicates in the system, when Martijn should look at the psycho-education videos. Once she has completed making the plan, she sends Martijn a text message to his mobile phone that everything is set.

**Claims:**

1. The effectiveness of treatment will improve if therapist set the treatment’s plan for patient.
2. Allowing patient to set desired treatment outcome will improve patient’s motivation to complete the treatment.
3. Showing a patient a list of safety behaviours to indicate which one they often apply in certain situation will not increase the chance patient will do or start applying new safety behaviours.
4. Giving patients early on a general idea about rational of the therapy will improve their motivation to continue the therapy.
5. Personalizing the home-based VRET system, for example considering the patient’s computer skill makes the system more pleasant to use.
6. Social phobic patients feel comfortable to interact with avatar coach.

**eCoach Adaptation Module – Session #2 (Block 5):**

*Martijn get Sophie’s treatment plan message notification via text message.*

*\*Few days later: Martijn’s treatment schedule\**

Martijn turns on his computer and adjust his sitting and viewing position following the instruction manual. Afterwards, he inserts his USB stick into the computer, puts on the heart rate monitoring device and starts the CATCH eCoach application. The eCoach login window pops up and then Martijn types in his username and password. After the process of verification and security check is completed successfully, a virtual character, i.e. avatar, appears on the screen.

The eCoach’s avatar greets and introduces Martijn to the eCoach system. The avatar then explains about the therapy procedure in the home-based treatment system, including *step-by-step* description in order to utilize the sensor equipment (the heart rate monitoring device), explains the basic interaction procedure with the eCoach system, provides him with a tutorial how to perform SUD/ heart rate calibration, and how fill in the online questionnaires.

After he gets acquainted with the CATCH treatment system and eCoach environment, the avatar informs him that the sessions is completed, and remind Martijn to logout out from the eCoach system and remove the USB stick.

*[Another story]*

Li Hua: After the eCoach introductory session, Li Hua has lost her USB stick and therefore she cannot login into the system. She calls Sophie in order to explain her current situation. Sophie invites her to come over to her clinic. In the clinic, Sophie enters the spare USB stick into her therapist system and generates a new USB security key for her, as well as asking Li to enter a new (from her last CATCH) password into the system. After this, Li receives the USB stick and goes home.

**Claims:**

1. If the treatment plans can be adapted to the patient’s situation, it will increase adherence to the treatment plans.
2. Patient will understand the therapy procedure of home-based VRET system (including the use of equipment and software, etc.). This understanding will increase self-efficacy of patient.

**Therapist Discussion Module (Block 6a)**

*[meanwhile in the clinic…]*

Sophie log-in into her CATCH therapist computer system. The system shows a list with all her patients and their current status, such as when they completed their last exposure session, percentage of the treatment plan completed and unread messages. Sophie sees that Heidi has complete a session yesterday. She clicks on Heidi’s name from the list to see her detailed treatment progress. A graph overview of Heidi’s activities and treatment progress are displayed. Now Heidi’s treatment progress can be seen and analysed based on her SUD score, heart rate, anxiety hierarchy, (speech) behaviour changes data, etc. Sophie also notices that there is an unread message from Heidi. She clicks on inbox from Heidi and clicks her last message. Heidi wrote asking about the progress she made with the home treatment because she has little confident about the result so far. After reading Heidi’s message, Sophie write a message to explain her that she does not have to worried about it as her treatment result looks normal and does not showing any anomaly. Moreover, Sophie also adds some complements about her persistent in order to motivate her to continue with the treatment plan. After she sends the message, Sophie continues to another patient. After everything is done, then she log-out from the CATCH therapist system.

**Claims:**

1. On average, a therapist spent around 5 minutes a week on patient that follows a home-based VRET therapy.
2. Providing information about the patient's performance and the ability to send and receive message provides the therapist enough functionality to guide patients effectively through their therapy.

**Progress Reflection and Briefing Exposure Module (Block 6b+7):**

Martijn starts his actual therapy session *(according to his treatment schedule)*. He inserts his USB stick, put on the heart rate monitoring device, setup the Bluetooth connection and starts the CATCH eCoach application. After he successfully logins into the eCoach system, the avatar greets him. Then the eCoach avatar kindly asks him to fill in the online (social anxiety) questionnaires. After Martijn finishes filling this in, the eCoach informs him that there is a new message from his therapist. Martijn clicks on the message box, and reads the new message from Sophie. She writes, although he was expecting that he would have made more progress by now, his progress is comparable with the progress made by other patients. Martijn also reads that she made a remark on his comment about his encounter in the supermarket in his street, which he wrote about last time. She understands and explains that this might have been an unpleasant experience in which he did not know how to react. Furthermore, she continues to explain that with virtual environment, he can actually experiment with different reactions and see what might happen in such a situation. Martijn is happy to see that the therapist follows his progress and has taken the time to give attention to his messages. This time however, he has nothing to write about. He therefore leaves the message box, and clicks on the progress overview. Here he sees an overview of social anxiety scores he has entered over weeks. He can also see his anxiety score in various exposure sessions, and he can also see the progress he has made on the fear hierarchy. The eCoach asks him whether he is satisfied with his progress. Even after the comments from Sophie, Martijn is still a bit worried, and indicates this to eCoach. The eCoach gives an overview on how anxiety progress on average, and explains that this might also vary for each individual. The eCoach invites Martijn to indicate his expectations for next week. After reflecting on his progress, Martijn likes to start with the actual exposure session. He clicks on this treatment plan. The eCoach explains that today he will have to give a presentation in front of a small audience. The eCoach also explains the goals of the exposure. Martijn should look at the audience when he gives his presentation, and he should not try to hold something as a trick to keeps his hands from tremble. Next, the eCoach ask Martijn if he also has a goal in mind for this session and gives him a long list of possible goals. Martijn select *speaking without stuttering* option. As stuttering is not under Martijn direct control, the eCoach suggests to change his goals into something he can actually control, for example, if he stutters to make a joke about it. Martijn agrees that this is a goal he could try to achieve. After this the eCoach screen disappears, the narrative text of the session appears on the screen and the exposure sessions starts.

**Claims:**

1. Getting feedback from therapist about last/ pass exposure session will increase chance of patient to continue therapy session.
2. Patient’s awareness that therapist will regularly monitor their treatment progress improves patient adherence.
3. Feedback from therapist about “events outside” the therapy will increase chance of patient to continue the therapy session.
4. Providing clear instructions about a session’s goal before exposure will improve efficacy of exposure.
5. Having an overview with interpretation of the progress so far will motivate patient to continue with the treatment.

**Exposure Module** (**Block 8):**

Martijn reads the narrative text. He should give a talk in front of an audience. This is the first time where Martijn has to perform something like this. The talk should take about five minutes and after this the audience will ask him a number of questions. The topic for his talk is about dogs. The narrative also gives Martijn some suggestions to talk about, dogs he knows, professional dogs, dogs versus cats, etc. He gets one minute to prepare himself for the presentation. After this, narrative text disappears and then Martijn is asked to give a SUD score. He feels anxious and therefore replies with seven. He can see room with an audience. One avatar of the audiences invites him and says that he can start talking. Martijn is a bit puzzled what to do and whether he should take this seriously. So he looks around for 10 seconds. He notices that the audience members are becoming somewhat restless. Then the same avatar asks him if there is a problem. Martijn blushes, not knowing what to do. Then the avatar suggests, that maybe he can tell them something about the dogs he has encountered in his life. All the avatars look again at Martijn. He does not have to think, his neighbours have a dog, which he tells to the avatars. After this he tells about other dogs he has meet in his life. Each time he stops talking one of the avatars gives him a suggestion on what to talk about. After the presentation, the avatars ask him all kinds of questions, which Martijn tries to answer as good as possible. Halfway, the avatars' questions changes and become a bit more provoking as Martijn had given a SUD score of three. After 10 minutes the question and answer rounds ends. Martijn sees again a new narrative screen, this time he has to give a talk about democracy to large audience. He is also reminded to look at the audiences, not to hold something, and make a joke in case he stutters. After a minute preparation, he again sees an audience and he start talking. 15 minutes later this session also comes to an ends, and the eCoach appear on the screen again.

**Claims:**

1. A long uninterrupted exposure session is more effective that multiple short exposure sessions.
2. During exposure, reminding patient to avoid safety behaviour will increase the effect of exposure.
3. Anticipation anxiety will increase if patient is exposed to a new social situation in a new exposure session.

**Current Exposure Reflection Module (Block 9):**

After exposure session has finished, the eCoach guide Martijn into (anxiety) reflection session. Here, the eCoach provides him with the overview of his SUD score result, and his heart rate data. The coach also gives him an overview of the time he was talking and the avatar was talking. The eCoach also asked Martijn to indicate whether he has applied any tricks (safety behaviour). Martijn is also ask to rate how much he achieved the goals for this sessions.

After this the eCoach suggest that Martijn take a rest for about five minutes, before he continue with the next 30 minutes exposure session. Then his screen turns black only showing a clock counting back. When the five minutes have past, Martijn sees the eCoach again and remind him about the goals for this session. After this, Martijn sees the narrative text again and a new exposure session starts.

*(\*Loop option: after reflection session, he may continue to do another exposure in the CATCH system\*)*

**Claims:**

1. Having patient reflect on their exposure experience in between or after the last exposure session will improve the efficacy of the exposure.

**PsycoEducation Module (Block 10):**

After reflection on the exposure experience phase, the eCoach provides Martijn with post-exposure (social anxiety) questionnaires that he need to fills in. Next, the eCoach shows him a short Psycho-Education video (e.g. general information about body respond towards a stressful situations, how to avoid the use of safety behaviour in uncomfortable or stressful situation, etc.). Martijn likes to see these movies as it helps him to understand what is happing with him, and he find them also motivating as he get a feeling that he is really learning something about himself.

**Claims:**

1. Short informative PsychoEducation video will improve motivation of patient to continue the therapy.

**Debriefing Module (Block 11):**

The treatment exposure ends with de-briefing phase. In this phase, the eCoach guides Martijn to reflect on his exposure experience by looking at his overview of his SUD score and heart rate result data, his (speech) behavioural changes result data, his safety behaviour result data, etc.. The eCoach notices that based on his anxiety response, Martijn might like to adjust his fear hierarchy in which Sophie could use it to make adjustment toward his treatment plan. Although, the system also offers Martijn the option to send his therapist a message to comment on this session, he does not feel the need to do this.

*(\*He runs the therapy in the CATCH system for several weeks according the Sophie’s treatment plan\*)*

**Claims:**

1. Looking at the plan or the content for next therapy session at the end of session will improve the motivation of patient to continue the therapy.
2. Reflection on the therapy’s progress will improve therapy adherence.

*[Another story]*

Heidi: After two treatment sessions, Heidi is ill therefore she cannot continue the therapy. Heidi then log-in into CATCH eCoach system and sends a message to Sophie via eCoach messaging system. Sophie receives the message and understands her situation. She adjusts the treatment plan (schedule) for her by updates Heidi’s treatment plan (schedule) in the CATCH system. She notifies Heidi that her treatment plan is changed afterwards.

After feeling better, Heidi does back into CATCH eCoach system and continue the therapy for several weeks more according the Sophie’s treatment plan that she received in her eCoach system.

*(\*Sophie notified by the system that Heidi is back in the therapy\*)*

**Total Progress reflection Module (Block 12):**

[*at home: last therapy session*]

After several weeks of therapy using the eCoach system, Martijn finally arrives at his last treatment session. As usual, in the beginning, eCoach guide him to fill in the online (social anxiety) questionnaires. Then the CATCH eCoach system provides him with an overview of the progress information from his entire treatment, such as: SUD score and heart rate result data, anxiety hierarchy, (speech) behavioural changes, safety behaviour list data, questionnaires results, etc.; displayed in the form of graph. The eCoach asks Martijn to reflect on the progress that he made. The eCoach also shows Martijn his fear hierarchy he has been working on for last weeks and again the eCoach ask Martijn to reflect on this result overview.

**Claims:**

1. Self-efficacy is improved by patient’s reflection on the overall progress made through the entire therapy session.

**Relapse Prevention Module (Block 13):**

After reflection phase, the eCoach suggests to focus on relapse prevention. Based on Martijn profile, the eCoach has selected a number of videos of other people that talk about what happened to them after the therapy finished and how they cope with situations they encounter afterwards. After showing these videos, the eCoach invites Martijn in order to develop a strategy to cope with potential relapse situation. The eCoach helps Martijn by giving him a number of situations which he might like to think about. He also offers ideas how to come up with coping strategies. Working together with the eCoach, Martijn develops a personalised relapse prevention strategy, for example, to expect some setbacks, to make keep a diary of his successes to help him when things are not going well, and when he notices that he starts to avoid situations, he should instead try to expose himself to these situations.

**Claims:**

1. Coping relapse can be improved by using “modeling-example” scenario (e.g. showing example of other people how to cope the situation they confronted).
2. Coping with relapse can be improved by having the patient to draw a plan in order to cope or avoid the relapse.

**Last Clinical Session Module (Block 14):**

[*in the clinic*]

Martijn meet Sophie in the clinic as scheduled by Sophie. In order to evaluate the treatment progress, first, Sophie asks him to fill in some (social anxiety) questionnaires. Then, Sophie performs post-assessment test (presentation test or behavioural measurement test). After the post-assessment test phase, then Sophie discusses with him regarding his experience using the CATCH eCoach system (did the exposure works? Any difficulty using the system? Any suggestion? etc.) In the end, Martijn is happy with the treatment’s result. He gains confidence and feels able to confront the situation where he really felt anxious about few weeks ago; for example the job interview. As he leaves, Sophie gives Martijn a number of information papers, including a print of his Relapse Prevention Strategy Plan.

*[Another story]*

Li Hua: After reflecting on the progress made during therapy Li and Sophie come to the conclusion that the therapy has not provide the expected outcome. In order to help Li with this situation, Sophie suggests another type of treatment for her.

**Claims:**

1. As it possible that home-based VRET does not work for all patients, de-briefing has to be done *face-to-face* with the patient to consider possible further therapy.