# Treating Cynophobia with Augmented Reality Exposure Therapy

[NCT ID not yet assigned]

11.04.2022

1. **Call for Participation**

A call for participation in the study will be made via social media platforms. Volunteers who would like to participate will be able to click on a link and register to the study if they agree to be contacted by the research team.

2. **Administration of Specific Phobia Scale**

The Turkish version of the Specific Phobia Scale will be administered to the volunteers of the study after they are explained the study and after they give their informed consent. They will be instructed to fill the questionnaire regarding their dog phobia. They will also be asked to fill a demographic form. Those who score above the cut-off point will be invited to the clinical and diagnostic interviews.

3. **Clinical Interviews**

During the clinical interviews, a clinical psychologist will interview volunteers regarding their phobia symptoms in accordance with DSM-5 criteria. With those volunteers who have a clinician confirmed phobia, a second interview will be conducted using Structured Clinical Interview for DSM-5 Disorders (SCID) to see if they have a mental disorder such as psychosis, substance use disorder, or epilepsy. Those participants who will be included in the study will be contacted and invited to the laboratory.

4. **Explanation of the Principles and Obtaining the Informed Consent**

Both groups will be invited to the laboratory for the baseline measurement. Upon their arrival, the study will be explained to them and why it is necessary to have a baseline measure of their phobia severity by seeing a real dog. The briefing and explanation will follow above-given 3 paragraphs:

We explain to the participants that their phobia is just illogical, not meaningless. It has been acquired through some form of learning. There are different ways of learning. People may learn socially, by talking to people or just observing them. People learn also through experience. We explain that for whatever reason the participant’s brain has associated dogs with danger. The exposure we will be doing works in a similar way that parents hold their kid's hand and open the closet to show them there is no monster under the hood.

We have to do the same to our brain. It has to unlearn the previous learning that dogs are dangerous. In other words, the brain has to learn by experience that its feared object is actually safe by spending safe time with it. That’s the basic principle of exposure therapy. We gradually expose a person to what they’re afraid of until the brain gradually learns it's

safe and the fear goes away. We also explain that exposure therapies are very effective. By conducting it with AR, we offer our participants the feeling of safety by exposing them to a virtual dog. By means of this technology, our participants will feel a sense of total control in terms of what is going to happen. Even though they will know that the dogs are not real, the brain does not distinguish the experience in terms of learning.

After the briefing, both groups will be given a form of informed consent. After that the baseline measurements with the real dog will be taken. The participants will then be randomly assigned to either control or intervention conditions. Both groups will be informed about their groups, explained the rationale for the random assignment and control group. The control group will only be tested for baseline where the intervention group will receive Augmented Reality Exposure Therapy.

5. **Real Dog Exposure to Measure the Baseline**

We explain to the patients why we need to measure their progress with the real dog. To have a baseline measure of their phobia, we introduce the dog to the patient. When the patients stand 7 meters away from the real dog we encourage them to walk closer by saying “Is that it or do you think you can approach more?”. If they can go closer to the dog, we say “Can you hold your hand close to it? Can you touch it?” When the participants reach the limits of their comfort zone that is they can not approach closer, we ask whether they would like to finish the testing.

The distance participants can approach the dog will be measured in terms of meters, the Behavioral Approach Test (BAT). Any physical contact with the dog will be measured visually for exclusion criteria i.e., the participants who can touch the dog will be excluded from the study based on the reasoning that they do not have a real phobia.

The Skin Conductance Response (SCR) will be measured to see physiological stress of the individuals via Shimmer3 GSR+ device placed on one finger. At the same time, participants will report how stressed they are (subjective unit of distress, SUD).

Participants will then be randomly assigned to either control or intervention conditions. Both groups will be informed about their groups, explained the rationale for random assignment and control group.

We say “Now you are comfortable with all these dogs, let's see how you will do with the real dog. I’m excited to see how you’ll do.”

6. **Rooms for the Intervention**

We will use two rooms for the intervention. Both rooms have enough clear space on the floor to eliminate the risk of obstruction by objects and also to have better render the AR dogs. The first room for the intervention is bigger than the second room. The rationale for the difference is that we aim to generalize the exposure learning in the first room to broader and different contexts. Thus, we have two different looking rooms of different sizes.

7. **The Intervention with the Augmented Reality Headset**
    a. **The First Room**

- Patient stands or sits in a corner of the room.
- We place one breed of dog at the furthest corner of the room (We have 3 dog breeds in various sizes we can modify).
- We ask the patients how scared they are out of 10, that is their Subjective Unit of Distress (SUD). Based on their level of fear we go on adjusting (Minimum to continue is 5/10).
- We start with one dog and then we put the other breeds next to it. We keep asking them what their SUDs are. Then we determine which one is the least scary to the patient and proceed with it only.
- We say “It is not going to get close to you, it is just going to move horizontally.” Then, we move the dog horizontally a little bit. We keep repeating it until the participants’ SUDs go down.
- When SUDs go down, we say “The dog is going to walk towards you a little bit or closer to you a little bit” (We keep repeating that).
- The dog comes to the middle of the room and starts moving horizontally.
- When their SUDs decrease, we add the second dog. Both dogs move horizontally.
- Then the third breed is added and makes the same horizontal movement.
- We then ask the patient to choose a breed of their liking to stay.
- We then say “Let’s go walk towards it a little bit.” and “Can you go with me?” and we go with the patient whilst monitoring their SUDs.
- We say “Let’s stay here” and “Can you sit there?” (during this stage, we talk and joke with the patients to help them relax)
- We then include patients’ cognitive processing. We ask the patient to describe the dog. We say for example “Can you tell me where the dog's head and tail are?”

- After the patient is comfortable and sitting close to the dog, we move the dog horizontally.
- We then add “Let’s see if you can touch its head or hold your hands close to it”. We calm and encourage the patient if needed until their SUDs go down.
- We move the dog to the far corner of the room. The dogs can perform actions such as sitting, barking, and jumping. We ask the patients to command “Sit!” to the dog and the dog sits. This way, the patient might feel a stronger sense of control over the events. Secondly, we ask the patients to command “Bark!” to the dog and the dog barks. Finally, we ask the patients to command “Jump!” to the dog and it jumps. In each turn, we ask the patients what the dogs are doing to engage their cognitive processing.
- Later, we ask the patients to call the dog near and sit. We control their SUDs and if it is below the threshold, we suggest the patients pet the dog while it is sitting.
- Finally, we say “I would put another dog here.” and put another breed of dog. “This dog will move a little bit here.” We ask the patients what the dogs are doing.
- We notify the patients that the dogs will move around and towards the person without prompts.
- In this room, we keep doing this until the SUDs get to the target SUD.
- Later, we say “Congratulations for doing this. Now, let’s go to the other room and try it there.”

**b. The Second Room**

- We explain to the patients that we will repeat the same exercises and start when they are ready.
- We start from the dog far away as in the first room. We ask the patients their SUDs. (Usually at that stage people state that they are comfortable).
- We bring the other dogs like it was done in the first room. We put all 3 different dogs here and there. If the patients are comfortable, we tell the patients that the dogs will walk around.
- When their SUD’s drop to 5, we say to the patients “Now, I will not give prompts about what the dogs will do. Is this all right for you?”
- Dogs will sit, walk, bark, and jump. Dogs first bark when they’re distant and they come closer and bark. During this stage, we will regularly monitor the SUDs.
- At the end, these dogs will be walking around, barking and jumping without prompt. After the patient is comfortable with the dogs’ sitting, barking, and jumping; we tell them “ We want you to feel comfortable by yourself and alone with these objects after

this intervention. So, if it is okay for you, I will leave the room and talk to you via a walky talky."

- We leave the room and talk with the patient via the walky talky.
- We say "I will put these 3 dogs and they are going to move all around you without my prompt."
- We include their cognitive processing and encourage them to describe the dogs by saying "Tell me what the dogs are doing? Tell me how many dogs are you counting? How many of them are moving, how many of them are standing or jumping?"
- When the participants are comfortable with their virtual phobic stimuli (SUD = 2) or their SUD's did not change for the last 10 minutes, we finish the intervention.

**Ending**

- When it's finished, we say "That is how exposure therapy works."
- We encourage them to try it at home. We say: "Watch videos and look at pictures of dogs. If you see a dog and you know it is safe, try to pet and play with them. If you see a dog on a leash walking with their owner, walk by them. Don't avoid it."
- Finally, we ask them to come back for the next measurement.

**8. Follow-Ups**

- At 1 week and 1 month follow-ups, we contact the participants and invite them to the lab. We test them using the real dog to confirm if their gains are maintained. We use the same measures and protocol as the 6th step, Real Dog.

**9. Statistical Analysis**

Data will be analyzed by using a statistical software called IBM SPSS 26.0. Considering the groups as fixed factor, linear mixed models will be used to evaluate the effectiveness of the Augmented Reality Exposure Therapy on the primary (Behavioral Approach Task) and secondary outcome measures (Specific Phobia Scale, Skin Conductance and Subjective Units of Distress).