"Attenuating conditioned fear using imagery-based interventions"
Manish Kumar Asthana
Indian Institute of Technology Roorkee, India
Mental Health Symposium 2025
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[2025/05/15 06:58] Carolyn Carillon: Hello everyone.
Today's presentation is being transcribed so those without audio or who require text only can participate in real time. The presenter may also use a teleprompter (speak easy) in local chat.
A little explanation about this service.
Voice-to-text transcriptionists provide a translation of the key ideas discussed, NOT a word for word transcription.
Voice-to-text services provide an in-the-moment snapshot of ideas and concepts, so that those who are unable to hear or to understand the audio program are able to participate in real-time.
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Transcription is provided by Virtual Ability, Inc.
The transcriptionists are Carolyn Carillon & Elektra Panthar
The speakers will be identified by initials as they speak.
The following initials in the transcription record will identify the speakers:
MA: Dr. Manish Asthana

<<transcription begins>>

[2025/05/15 07:00] Pecos Kidd: Good morning, audience. Welcome to Virtual Ability's 2025 Mental Health Symposium.
Gentle is having technical difficulties this morning - her power and internet went out a little while ago, so I have the honor to act as her backup.
We hope you will enjoy your time with us today, and that you will learn a LOT about our theme, which is "Facing Our Fears: Managing Anxiety About Life's Uncertainties."
Fear is a very powerful emotional reaction. There are many reasons we have fears in the modern world. I'm sure we all have our own private stock of things we fear.
If you are not able to manage your anxieties, your fear can become a disability. Luckily, fear is a treatable condition.
The broad theme of this conference allows us to look at the topic of fear from a number of different perspectives.
I think you will find that much of the advice our presenters offer about the particular fears they work with are applicable to other fears as well.
Now a housekeeping reminder for this conference.
Many of our presenters are new to Second Life. Please be patient with them.
Hold your thoughts and questions until they are done presenting; they need to concentrate.
Thank you.
Now ZZri will introduce our first session and our honored guest speaker.

[2025/05/15 07:03] Zri Portal: Greetings, everyone, and welcome to Virtual Ability's 2025 Mental Health Symposium!
I am Zzri Avian and I have been in Second Life for about 16 years.
I enjoy exploring the various regions and communities of Second Life!
I also volunteer as an information assistant for the Virtual Worlds Education Consortium (VWEC).
In real life, I am an IT Quality Assurance analyst from Malaysia.
Today, I would like to introduce Dr. Manish Kumar Asthana.
Dr. Asthana is an associate professor of psychology at the Indian Institute of Technology Roorkee.
He is interested in cognitive psychology, fear conditionings, and the emotions of stress and anxiety.
Today, he will explain how imagery-based interventions can attenuate conditioned fear.
Audience, please hold your questions and comments to the end, so as not to interrupt the presentation's timing.
Welcome, Dr. Asthana! The floor is yours.

[2025/05/15 07:04] Carolyn Carillon: MA: thank you
This is my first time in SL
So excuse me
If I make mistakes
I will start right away
We will have enough time for questions at the end
I hope I have answers for you
Feel free to ask any question
Today I want to talk about Attenuating Conditioned Fear Using Imagery-Based Interventions
How are we treating it?
I'll be talking more about fear & anxiety
How are they different
Then I'll talk about our study and how it can be treated
I took this topic in the year 2010 when I started my PhD
I took it because there are people who suffer from anxiety disorders
There are different kinds (i.e. social phobias)
PTSD is another kind
When we talk about fear, it's important for survival
We respond to threats
Like flight or fight
What is threatening or non-threatening
We need to know to live
We all have different responses to threat
We have a threat-based fear response
The threat center -- the amygdala -- is responsible for the response
We have different responses to the spider and the cobra
With different intensities
If it persists for a long period of time, in the absence of the threat, can lead to a psychopathology
That's anxiety
Fear is the immediate threat response; anxiety is the anticipation of the threat

Thinking of the spider, if we are afraid when it's absent, that's arachnophobia
Dysregulation of fear is the root cause of anxiety
People who suffer from anxiety can't regulate their fear
This dysregulation leads to disorders like PTSD & other phobias
What is the underlying cause?
Is it innate?
Are we born with these deficiencies?
Or is it the environment?
When we talk about anxiety disorder, it can be either
It can be something in our environment or a result of your experiences or trauma (including physical trauma)
How do we study it?
We use a Pavlovian conditioning model
And we look at the biomarkers for anxiety disorders
The challenge is that anxiety is underreported
How do we study conditioning in the lab?
We generally look at these phases: habituation, conditioning & testing
We put a rat in a box
Then we give the rat a shock
It shows a freezing behaviour
When it's paired with a musical sound, the coupling happens
Then every time he listens to music, he experiences the threat response
That's conditioning
Then we test how much the rat is showing fear
We change the context
And present the context
Then he experiences the threat
He's conditioned to so many stimuli
Any cue will create anxiety
And release cortisone, the stress hormone
We can't do this with humans
Instead we bring people into the lab
And I present a square on the screen
So they ignore it
There's no physiological response
Then we present a threat
And there's a skin response
We record it
When the blue square is paired with a scream
As if someone is in pain or needs help
That makes the person learn the threat
Some labs use electric shock
Some use aversive pictures
Or pressures
Here, we use two squares -- one paired with the sound and one without
The person learns that the blue square is bad
We could use different coloured squares
The blue could be bad, and the yellow not
The person learns to couple the fear with the blue square
With exposure therapy, we expose the person to the blue square without the sound

To lessen the fear response

The problem is that after performing safety learning, fear comes back
Under three conditions
Spontaneous recovery -- after a time, the fear returns abruptly
Like when you cross the street and you hear a scream, the fear comes back
Without thinking
That's a reinstatement
The third condition relates to the context
We use flooding
There's no drug-free regime
But drugs alone are not effective
We can also use music therapy
And other therapies like mindfulness
And also pharmacological methods
Which are effective but these have side effect

Every stimuli in the environment, we attach value
If we like apples, not bananas, we give more value to the apples
We give more value to the threatening stimuli because it's life or death
Can we devalue those stimuli?
If we do that, we're doing safety learning
We have to see how the stimulus is being experienced
How are they responding?
We change the value -- the woman may be screaming because she's excited

What is the reconsolidation process?
These threats pass to our short-term memory
When we go to sleep, it transfers to long-term memory
And it's kept
It's connected to the working threat memory
This working memory is connected to our decision making and thinking
Once consolidation is done, the threat remains for a long period of time
When you see a threat, the consolidation memory becomes malleable
At this time, we can modify the memory with new information
The old memory gets overwritten or rewritten
This process can be used to alter pathological memories
But there are conditions
When the fear is very strong, it will take more time
It can't happen overnight
Also, the nature of the stimuli
Or the context
Or the physiological composition of the individual
These have an impact
Some of the interventions we use to modulate the fear memory are: different styles of music, imagery (which I'll talk about), neural stimulation, virtual reality, using a novel stimulus

[2025/05/15 07:31] Elektra Panthar: MA: New methods can be used to augment the efficiency

Imagery rescripting (ImRS): devaluation of the cognitive representation of the UCS in a positive direction (Arntz et al., 2012)
Another method is Imaginal extinction (IE): vivid imagination of the conditioned stimuli during extinction (Agren et al., 2017)
We devalue the negative stimuli
1. Imagery rescripting is an intervention based on UCS devaluation
2. Participants are instructed to devalue the cognitive representation of the UCS, and modify it in a positive manner (Arntz, 2012)
3. Imagery rescripting may create alternative positively valenced mental representation of the UCS, that compete with the original negatively valenced representation
Now we have a new template
For example the person distinguishes the different threats different snakes provide
The amygdala send a signal to the brain saying there's no need to worry
Individual in the experiment will hear the sound less
Adding ImRS to extinction training was more effective in reducing UCS expectancy ratings during renewal testing
Extinction was most efficient in reducing UCS expectancy ratings and SCR; however both extinction and ImRS reduced negative UCS valence after reinstatement
ImRS reduced fear potentiated startle responses after reinstatement indicating UCS revaluation (Kunze et al., 2019)
ImRS + Extinction did not prevent the return of fear through reinstatement
ImRs+ Extinction demonstrated increased UCS revaluation
Imaginal Extinction (IE) - in this study in the lab we recruited participants
Participant is asked to vividly imagine the conditioned stimuli with 'the mind's eye'
In imaginal extinction (IE), visualization cues signal the occurrence of the stimulus without the actual presentation of the conditioned stimulus
They can be different cues - animals, colors etc
Detailed requests for mental images
Through repeated presentations of the mental imagery of the CS+ without the UCS, the CS-no UCS association forms
Imaginal extinction is identical to the standard (or in-vivo) extinction (SE) process, except that it uses mental imagery instead of the actual perception of the stimuli
IE and SE were observed to produce comparable results in reducing fear responses
We wanted to compare these results in our environment
Reactivation of the CS+ using mental imagery was effective in opening the reconsolidation window and attenuated conditioned fear responses
Conditioned fear acquired through visual presentations of the stimuli generalized to the mental imagery of the CS+
IE was as effective as SE in reducing conditioned fear
High vividness of imagery during IE is not necessary for reducing fear responses
Sometimes it results in heightened fear response
Research gaps
Methodological limitations of the previous studies
• Increased cognitive load when ImRS was combined with extinction trials
More cognitive functions are involved with this method, so maybe the image rescripting can become better at stopping the return of fear
• Relatedness of the CS with the UCS
• Timing of the different experimental phases - different phases in different days
• Standardized imagery rescripting procedure

Different procedures in different places - different methodologies, so we have to standardize them for more efficacy of results
There is no study known to have studied the effect of ImRS and IE on generalized fear
That's why we started this imagery based methods in our lab
The long term effects of ImRS and IE have not been explored
We want to know how long lasting these effects are

How does IR work?
We give a scenario to the person, related to the picture
It's been standardized by a non-English speaking person so it can be easy to understand
The scenario is about a building on fire, people running, firefighters working
A woman comes to a fireman saying her child is still on the 2nd floor
There's no way to reach the crying child
Someone brings the ladder
The fireman goes up, takes off the window - the child cries as he is uninjured - the firefighter saves the child
The mother thanks the man and the child is saved
At the end once they read the scenario we ask what they understood

After this we perform the fear acquisition and extinction training
We associate the small circle with the fire - several presentations
We ask them to say the UCS expectancy
In the generalization trials we use these circles - small UCS, the big one is the UCS -
We ask to what stimuli people associate with fear or with safety
We don't want people to leave the lab with fear so we provide a safety narrative
You see smoke, you run towards it, the building is on fire, the firefighters are there, the woman asks for help for the child, the ladder is brought, the fireman goes up, grabs the child, brings him to the mother, the mother is relieved and everyone cheers
The person understands a threat is involved but knows it can be dealt with
We rescript the safety and provide the extinction training to the person so that they know the fear narrative is dead (small circles aren't negative anymore and don't trigger fear anymore)
People have to think vividly about these images

In the results we see all groups learn equally

Experimental Phases
Day1- Habituation Day 2-Acquisition Day2-Extinction Day 15- Spontaneous Recovery
People are able to rescript the fear
We tested what happens if the fear returns
After 15 days we asked the people to come back
We presented them with the images - fire, small circle, large circle
We measure their skin response, their breathing, heart pressure
After 15 people show less response in the IR group
The IE seem to fail concerning the return of fear
There are two skills used to gauge the reactions: arousal skill and valence: pleasant to unpleasant

Conclusion

1. A combination of imagery rescripting and extinction could be highly effective for treating social anxiety disorders, phobias etc.
2. Imagery rescripting combined with extinction could be used as a self-help strategy for individuals at risk of developing anxiety disorders, or experience sub-clinical levels of fear
3. Imagery rescripting combined with extinction could also used to treat addictions
4. Finally, imagery rescripting combined with extinction may be highly effective, non-invasive, drug-free and cost-effective intervention for treating anxiety and related disorders
We know this can take time to implement

Future Directions
Optimization of Intervention protocols
Replication with Clinical Populations
To ensure valid results
Integration with Virtual Reality
VR is a valuable tool
Exploring the Neural Correlates
So that we can overcome these fears, knowing how they develop
Enhancement using Neurostimulation
Thank You for giving me this opportunity!
You can contact me here
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[2025/05/15 08:01] Shaerken Changeheart (ChangeheartShaerken Resident): APPAWS!
[2025/05/15 08:01] Zzri Avian (Zri Portal): ♪♫♥ Applauds!!! ♥♫♪
[2025/05/15 08:01] Beth Ghostraven: ♩♪♫♬ APPAWS! ♩♪♫♬
[2025/05/15 08:01] Lady Tigress Bonded (pet Karu): *•.¸'*•.¸ APPLAUSE ¸.•*´¸.•*
[2025/05/15 08:01] Dr. Manish Asthana (VAIPresenter8 Resident): thank you everyone

[2025/05/15 08:01] Elektra Panthar: PK: Thank you so much - we'll take just a couple minutes for questions
[2025/05/15 08:02] Carolyn Carillon: Q: can hypnotherapy work to treat social anxiety?
MA: I'm not an expert in hypnotherapy, but I've read papers
I think it works with the neuromechanisms, but the individuals have to undergo different conscious states
When they do that, they can't control
There's a gap
It's challenging for them to understand
When hypnotherapy works, they take them to a place where they are more comfortable
But the real world is filled with dynamic information
Rescripting doesn't take you away
It just allows you to change the narrative about the threatening scenario
And it gives you more control
At the beginning, it may be difficult
But with practice, it improves

[2025/05/15 08:01] Mook Wheeler: COMMENT/QUESTION: I have moderate-severe aphantasia, which prevents me from forming mental images well. Any image I try to imagine is always vague, never 'vivid', even 'wrong'. There are different levels of aphantasia, and ~5% of the population may have it; the figure may be higher or lower (many people are not aware). As individual differences in mental imagery were not mentioned, I am wondering if current research is assuming a *universal* capacity in humans? Besides being a gap in the literature, could this be a problem for the imagery methodologies you described?

[2025/05/15 08:03] Warthog Jun: Q: Has anyone used LSD to heighten the imagination or fear response?

[2025/05/15 08:03] Jadin Emerald: Q: Forgive me if you already addressed this (migraine is affecting vision this morning and I couldn't keep up with some of the text), could you speak a little to when anxiety/fear/terror gets "baked in" to a degree to a person's neurological system at a pre-verbal stage of their development?

[2025/05/15 08:04] Carolyn Carillon: PECOS: we need to move on
So if you want to IM Dr. Asthana, he can respond individually
MA: I'd be happy to answer any question you send to me
asthanakm@gmail.com; m.asthana@hs.iitr.ac.in