

# Module: Psychological Foundations of Mental Health

## Week 3

### Introduction to emotion and emotional processing

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#### Topic 3

#### Emotion regulation: top-down cognitive regulation on emotional responses

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#### Lecture transcript

##### Slide 3

In the early 2000s, researchers called Derryberry and Reed recognised that, while some researchers had suggested that anxiety was associated with attention biases towards threat, and in particular, difficulty disengaging attention from threats, this wasn't true for all people with high levels of anxiety. Some anxious people showed no such bias. They suggested that attention is not only bottom up or involuntary, but that there is also a voluntary attention system. That is, the general capacity to voluntarily control attention in relation to positive as well as negative reactions.

They broke attention control down into two separate components. The ability to voluntarily maintain the focus of attention on the task that you're performing and to ignore thoughts or things in your environment that might distract you. Also, the ability to intentionally shift attention from one thing to another, such as when we're multitasking. Like when we're making notes in a lecture, and we shift between listening and writing.

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They hypothesised that differences between individuals and their ability to control their attention, to focus and shift it at will, might explain why some people show an attention bias and others don't. In their 2002 study, they found that individual differences in self-reported attention controllability, moderated the extent to which anxious people attended towards threat stimuli in a dot probe experiment. This finding has been replicated elsewhere, too.

This means that for anxious people with high attention control, they were better able to shift their attention away from and disengage from threat stimuli and so show less or no bias. For people with low attention control, they had greater difficulty disengaging from the threat stimuli. They suggested that attention control and the ability to shift away from threatening thoughts or stimuli can help limit the emotional impact of threatening information.

Consistent with this idea is evidence suggesting that people who are exposed to trauma but who have high attention control seem to develop less post-traumatic stress symptoms than people with low attention control.

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But it gets more complicated. The ability to control one's attention voluntarily is not static. It might change depending on various factors. In other words, in some circumstances, one might show good attention control, whereas in other circumstances, the same person might show poor

attention control.

In some circumstances, people with poor attention control can compensate for this deficit by increasing their effort. This is most likely to happen when one is engaged in doing something that is particularly relevant to one's goals. For example, a person might have poor attention control in many other areas of life. But they may want to get a degree so much that during their lectures, they're able to put off distraction and focus very hard on their lectures.

Michael Eysenck and his colleagues from various colleges in the University of London suggested in 2007 as part of their attention control theory that this ability to compensate for poor attention control has its limits. And this is particularly relevant for anxious people. When people are engaged in doing something that is exceptionally demanding, and their cognitive resources are heavily loaded or when they're not very motivated to focus, then it will become increasingly more difficult to prevent themselves from being distracted by irrelevant thoughts and similarly in their environment.

Berggren and colleagues examined this idea using a visual search task, where participants who had high and low anxiety had to locate certain target faces amongst distracted faces. They then manipulated cognitive load by presenting a number on the screen in between visual search trials and asking half of participants to count back in threes from that number. High and low anxious participants didn't differ from one another in their performance in the visual search task when they were not cognitively loaded. However, when there was high cognitive load, highly anxious participants showed evidence of difficulty locating neutral faces amongst emotional distracted faces, whereas participants low in anxiety showed no such difficulty.

#### **Slide 6**

We might ask whether, if attention control can limit the emotional impact of stressful events on people's lives, can we train people so as to enhance their attention control, and in so doing, help them deal with stress and anxiety? Bernstein and Zvielli recently investigated this using their attention control training tool, the attention feedback awareness and control training, A-FACT. In A-FACT, participants are given a standard dot probe to measure their attention bias.

After each block of trials, participants are shown a thermometer that reflects the extent of their bias. They're told that this reflects the extent to which their attention is grabbed by the threatening pictures they're shown. And when the thermometer is in the red, this means that their attention is being influenced a lot by these images. They're told that to get their thermometer down to the green, they must balance their attention more evenly between the images and not let the content of the images influence their attention.

After the training, participants were shown a number of fear-eliciting images and were told that they could press a button to stop the presentation of each image if they wished. This was used as a measure of avoidance. After this, they were shown anxiety-eliciting movie clips of a person being chased by an aggressor.

They were asked to rate their anxiety immediately after the clip and then again 60 seconds later. They used this to index emotional recovery after a stressor. Participants who completed A-FACT showed improved ability to disengage with threatening images in a dot probe administered after the training was complete, suggesting that their attention control had improved. They also showed less avoidance of the threatening images and quicker recovery after the stressor than participants in the control condition. This suggests that attention control can influence the way people respond to emotional information they're exposed to, and that training attention control might reduce the emotional impact of this information.

#### **Slide 7**

Another way to control emotional experiences is through cognitive reappraisal or restructuring. Cognitive reappraisal involves transforming the meaning of a negative situation that one

encounters, and in so doing, reducing its emotional impact. This approach is said to be antecedent focused, as it involves thinking about the causes or antecedents of a situation and trying to reinterpret them so as to reduce the emotional impact of that situation. This is in contrast to response-focused emotion regulation strategies, where one might try to directly manage the feelings that a situation evokes, such as with relaxation techniques. Reappraisal also runs counter to other cognitive strategies for regulating emotions, such as expressive suppression, which involves active attempts to hide the emotional impact of an event.

As with attention biases and attention control, individuals differ from one another in terms of the extent to which they reappraise or suppressive strategies in their management of the negative emotions evoked by certain situations that they encounter in their lives.

#### **Slide 8**

It's often possible to reappraise situations ourselves. Such as if we're walking past some friends and we wave, but they don't respond and our immediate thought is that they're ignoring us. But we then reappraise the situation and conclude that they probably didn't see us.

However, sometimes we are only able to reappraise something because of information given to us that helps us transform the meaning of a situation. In 1997, Stemmler provided a novel example of this. In their experiments, participants completed a mock task. And then an angry experimenter tells them that they have performed poorly, and that this is because they must have intentionally not complied with the experimental instructions given to them before the task.

Participants were either given no excuse for the behaviour of the experimenter, or they were given one of two different interpretations for why the angry experimenter made such accusations. They were either told that the experimenter was faking it or that the experimenter was new and that their accusations should be ignored. The actual researchers then measured differences in the effect of these instructions on participants' ability to reappraise the behaviour of the experimenter.

The participants who were given excuses for the experimenter's behaviour showed less physiological reactivity to the experimenter's provocation. And they also reported being less angry with the experimenter. Mauss and colleagues replicated this study, but found that individual differences in the ability to use reappraisal to regulate one's emotions, as reported using a questionnaire, influenced the extent to which participants in Stemmler's original experiment could use the excuses for the experimenter's behaviour to down regulate their physiological response to provocation.

#### **Slide 9**

There are a range of emotional disorders that have been associated with an inability to properly reappraise emotionally provocative situations. As with attention control, it might be possible to help people down regulate their emotional experiences by training them in being able to reappraise negative situations. In fact, this training is one of the core components of cognitive therapy for emotional disorders like major depressive disorder and anxiety disorders.

During this therapy, people are first taught to identify negative thoughts. Then they are asked to consider the evidence in support of this conclusion or appraisal and evaluate the probability that this appraisal is true. After this they are asked to challenge their negative thoughts by considering evidence that this thought might not be true. They are then asked to reevaluate the probability that their appraisal is correct.

For example, someone who is socially anxious might see someone laughing whilst they are giving a speech. Through this training in restructuring and reappraising negative thoughts, a person would be taught to evaluate what they think the person might be laughing at, how likely it is that the belief is true, and then to consider an alternative cause for the laughter. By practicing this reappraisal technique, it is hoped that a person who is less able to reappraise negative situations on their own would develop the tools to do it when they encounter negative situations in the future. And in so

doing, they should be better able to regulate the emotional response to those situations.

#### **Slide 10**

So far we've talked about ways of down regulating emotional experiences through purely cognitive means. But emotions such as fear can be down regulated through direct experience also through a process called extinction. As you are no doubt aware, after somebody has acquired fear for a conditional stimulus, or CS, by its pairing with an aversive unconditional stimulus, or US, fear can then be reduced or extinguished by repeated presentation of the CS in the absence of the US. So if we pair a triangle with an electric shock four times, then we would expect that repeatedly presenting this triangle without the electric shock would reduce any fear that had been acquired. As with the other things we've discussed, it's important to remember that there is variability between individuals in the extent and speed with which fear extinguishes.

#### **Slide 11**

So how does extinction reduce fear? Previous researchers believed it involved unlearning of fear. So if conditioning involves the formation of a CS-US association, through extinction this association was gradually broken up or deleted.

However, several researchers showed that fear can return after it has been extinguished, suggesting that the association between the CS and the US that evokes fear has not been deleted. This suggested that extinction may involve the development of an inhibitory association between the CS and the nonoccurrence of the US, a CS-no US association. So the excitatory, fear evoking CS-US association remains intact after extinction, but it becomes inhibited by the new CS-no US association that has developed through repeated presentation of the CS without the US.

After extinction, these associations compete with one another. And if the CS-US association is insufficiently inhibited, then fear can return. There are several circumstances in which there might be insufficient inhibition after extinction. These are discussed in the references in your slides. But we'll focus on one particular example of return of fear here.

#### **Slide 12**

The example we'll use is referred to as context renewal. This was exemplified in a study by Vansteenwegen and colleagues in 2007, some experts in this field from Belgium. They examined how extinction learning can be context dependent and how if extinction takes place in a context that is different from an original conditioning context, a return to this original context or some other context after extinction might evoke a return of fear.

In their study, they recruited participants who had specific phobia for spiders and they presented them with videotapes of spiders in a real world context, such as walking along the kitchen counter. Over the course of this presentation, participants fear reduced. After this phase, participants were shown a spider in a different context, such as in a bedroom. This change in context evoked a return of fear, suggesting that the learning that had taken place during extinction was context dependent.

In other words, rather than learning that spiders were not as dangerous or unpleasant as they previously believed, participants instead seemed to have learned that spiders in kitchens, for example, were not so bad. This meant that when a different context was presented after extinction, there was insufficient inhibition of the CS-US association, and fear was again evoked. Given that extinction learning underlies CBT for anxiety disorders, this might be an important mechanism that explains clinical relapse.

#### **Slide 13**

But extinction is not only useful in treating pathological fear and anxiety. Extinction occurs in everyday life and can prevent fear from becoming pathological after we have aversive experiences. To this end, individual differences in extinction learning might influence the emergence of anxiety disorders. For example, Lohman and colleagues examined whether individual differences

in performance in a fear conditioning and extinction procedure predicted the later emergence of PTSD.

Participants in their study were soldiers who were to be deployed in Afghanistan. Four months prior to deployment, participants completed a fear conditioning and extinction procedure like the procedure we previously described with the triangles. When participants returned from deployment, the researchers completed structured clinical interviews with them to examine whether they had acquired post-traumatic stress symptoms.

Soldiers who returned from deployment with PTSD showed difficulty learning to extinguish their fear prior to deployment, relative to participants who returned without PTSD. This relationship was independent of pre-deployment stress symptoms. It appears then that individual differences in the ability to extinguish one's fear after an aversive experience can help regulate one's emotional responses to these experiences, with potentially long term consequences on a person's mental health.

#### **Slide 14**

Finally, another way to regulate the emotions that are evoked by a situation is to alter the memory for that situation after it has occurred. As you've already learned, memories are not fixed representations of events as they actually happened. Instead they are flexible and can be subject to change. With memory rescripting, this change is intentional and top down, rather than some of the more bottom up ways in which memories can become altered, such as through biases and encoding and consolidation.

This idea was first presented by Pierre Janet, who conducted imagery substitution with hysterical patients in 1919, and was then adopted by Aaron Beck, who was considered to be one of the fathers of cognitive therapy. Beck realised that it was possible to modify what he called visual cognitions or mental images of negative experiences and modify the emotions that they provoked.

#### **Slide 15**

During memory rescripting, people first activate a memory of an emotional event. They must then identify and focus their attention on the feelings, emotions, and thoughts that this memory evokes. Then they must rescript this memory by framing it within a positive or neutral context, or even by altering the events in the memory so the consequence is less negative. For example, a person might recall a memory of them being assaulted. They might then think about the fear and helplessness they experienced during this event. Then they could rescript this memory by changing it, so that someone intervenes and stops the person committing the assault.

#### **Slide 16**

Memory rescripting might also be used to enhance extinction learning. In extinction, besides the inhibitory learning that goes on, there is also some learning regarding how aversive the unconditional stimulus, or US, is. For example, when someone is socially anxious and they are afraid that talking in public will result in criticism or humiliation, extinction involves reevaluating how aversive it would be to be criticised or humiliated in public. In one study, Dibbets and colleagues adapted the context renewal paradigm that we described earlier by Vansteenwegen and colleagues, and they used this paradigm to examine the effect of rescripting on extinction learning.

Participants were first conditioned to be afraid of a picture of a motor vehicle presented in a play area by presenting it with a US, images of a mutilated child. The motor vehicle therefore acted as the CS and the play area was the context. In the next phase, the vehicle was then presented repeatedly in a different context, a service station, and the images of mutilation were never shown.

One group of participants was told that during extinction, they should devalue the US by thinking about how they were able to save the life of the child. Whereas another group were given no instructions. The participants who were given the rescripting instructions showed less return of fear after extinction when the CS was shown in the original context, the play area, than those

participants who were given no instructions. So rescripting the original conditioning memory and devaluing the US seemed to prevent a return of fear.

#### **Slide 17**

Rescripting has therefore been suggested to serve a number of different functions. It gives people the opportunity to update memories for negative or traumatic experiences and correct them if they've been poorly processed. It allows people to explore any emotional responses that may be inhibited and which may not have been fully acknowledged or experienced before or after a negative event. And it allows people to explore any trauma related beliefs that they might have, such as feelings of helplessness or powerlessness.

It does this by encouraging mastery and control over the outcomes of a negative situation. This has been referred to as Type A imagery rescripting by Emily Holmes and colleagues, as it involves retrieving a memory for a negative experience and modifying that memory and its associated emotions and beliefs. Type B imagery rescripting, on the other hand, is said to involve regulating negative emotions about one's self by constructing a new positive image about one's self.

Given its focus on revisiting traumatic memories and altering them, memory rescripting techniques are often taught to people with post-traumatic stress disorder to help them deal with the emotional response to a traumatic memory. But it can also be used in everyday life to deal with the negative experiences we encounter on a daily basis that evoke a significant emotional response, but which we cannot go back and change. Instead, we can try to modify and rescript our memory for these events and make them more positive or benign.