

Managing the four main psychological stress reactions

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1. Objectives and readers

This publication is aimed at a wide range of intelligent readers, from people looking for ideas on how to manage psychological stress reactions in their lives to stress researchers.

(The phrase 'psychological stress' distinguishes this from the physically created stress we experience from simply doing hard work, feeling cold, or being injured or unwell.)

Most material on stress focuses on ways to get respite from challenging situations (e.g. a holiday, a rest, exercise, hobbies)

or put them out of mind more quickly (e.g. mindfulness meditation), and ways to avoid distressing yourself with irrational thoughts (e.g. using CBT methods).

In contrast, this publication focuses on the logic that drives four specific reactions to challenging situations and specific thoughts that help reduce the reactions to reasonable, healthy levels.

Most of our 'stress' comes from real challenges, especially problems that need to be solved. Simply putting those problems out of our minds so we can be calm usually does not solve the problems. So, this publication discusses ways to get calm enough to think effectively and avoid debilitating over-reactions, and discusses ways to think through challenges productively while staying calm.

The publication contains some well-known information but also some insights into the mechanisms involved that are not well known. These insights are logical consequences of phenomena with which most readers will be personally familiar.

Although many scientific studies have been done in this general area there remain large gaps in understanding. Most of the ideas and recommendations presented below do not have empirical scientific support at this time, but that is not because they have been tested and found to be wrong. There simply is no directly relevant research so far.

2. Some definitions

The phenomena discussed in this publication are all reactions associated with what we usually call 'stress', 'pressure', or 'anxiety'. They have been separated into four reactions that serve different purposes and have different drivers. The mix of reactions we experience depends on our circumstances and thinking.

There are competing definitions and terms used among experts, but in this publication the reactions are named and defined as follows:

The fight-or-flight response: This is the physiological response that is set off when we perceive or think of something with the necessary alarming characteristics. It includes increased heart rate, breathing, and sweating.

Muscular tension: The persistent (often un-noticed) muscular tension that results when we perceive or think of something with the necessary characteristics. There are also slight posture changes.

Intense thought: The intense, sometimes persistent thinking that we often do when concerned with an important problem of some kind that we have yet to solve.

Vigilance: The sustained, intense perceptual focus that results when we are particularly concerned with something and looking for more information about it.

3. Their value

The reactions listed above have been identified because they have value to us, if not always today, then usually in the time when they evolved. The effects of each of these reactions are discussed in detail later, but in summary they are as follows:

- The fight-or-flight response and muscular tension are forms of physical preparation for anticipated or ongoing challenges.
- Intense thought and vigilance are allocations of mental capacity to particular challenges.

These reactions have short- and long-term effects. Some effects are positive but others are negative. For example, an intense fight-or-flight response during an

academic examination can cause problems with working memory, while chronic tension can cause headaches.

These reactions have evolved over many species and hundreds of millions of years to be helpful, but are not always ideal in the developed modern world, which more often challenges us mentally than physically, and often over a long period. Competitive sport is a rare exception. Often the issue is overreacting to thoughts and situations.

These reactions are, to some extent, precautionary. That is, they kick off sooner and at higher intensity than is usually necessary, just in case. It may be some time before it is clear that they are not needed and this is one way that uncertainty is crucial in stress reactions.

The following sections discuss each reaction in detail, explaining how they work and how they are triggered.

4. The fight-or-flight response

4.1 The reaction

The fight-or-flight response is a collection of physiological changes that happen when particular types of challenge appear.

These physiological changes typically include release of hormones, principally adrenaline (a.k.a. epinephrine) and cortisol, increased heart rate and breathing, increased sweating, blood sugar, blood pressure, and blood flow to muscles. This is combined with reduced digestive activity, salivation, and urine formation. In more extreme cases this also includes reduced blood flow to the skin, making a person's face look pale, and a desire to urinate or even defecate.

There are variations on the fight-or-flight response, such as the difference between anger and fear, but much of the underlying biology is similar.

The response can develop within seconds but usually takes much longer to abate. The half-life of the longest lasting stress hormone, cortisol, is between one and two hours, unless action is taken to remove it.

If a person is chased and then physically attacked in the street then a full fight-or-flight response will probably occur. If a person is verbally attacked in a business meeting then a similar but less intense fight-or-flight response kicks off. Most people who go through a working day punctuated with occasionally stressful clashes will experience a mild fight-or-flight response repeatedly, raising stress hormone levels.

4.2 How it can help

All these changes prepare the body to make an immediate, intense, physical effort. The stronger the fight-or-flight response the more it is suited to an effort that is immediate and intense. More energy is released into the bloodstream, which is directed towards skeletal muscles needed for running or fighting and away from systems not needed in the short term, such as digestion.

Breathing, heart rate, and blood pressure all ramp up to support an intense muscular effort.

The bladder and bowels may be emptied to save weight and increase running speed. Less blood flow to the skin may also reduce blood loss from cuts in a fight, at the expense of less efficient heat loss if a longer effort is needed.

In the short term (less than 30 minutes) and when the fight-or-flight reaction is only moderate, long-term memory is slightly improved (both for forming and retrieving memories) (Sapolsky, 1998, chapter 10).

4.3 How it can hinder

This reaction has evolved through millions of years and many species to deal with life-or-death situations that are much less common today for humans in the developed world.

We may find that our bodies gear up to fight a bear when the challenge we face is a difficult phone call or an academic examination. The physiological preparation is not of the right type and may hinder mental performance rather than help it. When the reaction is intense or if it continues for as long as 30 minutes, long term memory performance is reduced (Sapolsky, 1998, chapter 10), sometimes considerably. There are also likely to be problems with working memory (for short term use) but it is hard to separate these from the distracting effect of pressure situations.

When stressed we tend to continue with solutions that have worked in the past, even when they are not working now. Instead of thinking creatively about alternative solutions we just try the same ones, but harder.

Stress reactions also tend to be counter-productive in social encounters, leading us to react in ways that we regret later. Calm, socially confident, patient people are generally better respected and liked.

Sustained over weeks and months this kind of hormonal release and the other physiological elements of the fight-or-flight response can damage health seriously. It can also lead to 'burnout', where a person is unable to continue with normal life and needs respite, perhaps for weeks or even months.

4.4 Drivers

The fight-or-flight response is a physiological preparation for action, so the aspect of stressful situations that triggers

this response must be whatever it is that suggests an action is needed. It must be the result of some new information or realisation that implies an extra effort of some kind is needed.

E.g. When walking in woods at night, a sudden rustling sound might set off a reaction. That sound could be a dangerous animal or person coming to attack, or just a bird or small animal. Until we know which, the body gets prepared for action just in case.

A fight-or-flight response may start even if the extra effort required is not immediate, intense, and physical. Perhaps it is something that will have to be done later, or is purely a mental effort. The reason for this is that we often do not know immediately what kind of effort is required or when. A reaction starts anyway, just in case.

E.g. Failing an exam is a setback and setbacks are triggers because they require extra effort to compensate. Exactly what kind of effort and when might not be so clear to the stressed person at first. Specifically, failing an exam means explaining it to friends and family, deciding whether to retake, and perhaps retaking the exam. It is a career blow and means that lots of things later in life will be just a bit harder.

E.g. Giving a speech to 100 people means getting prepared, delivering the speech, dealing with reactions to it, risking serious reputation damage from performing badly, and so on.

It is not surprising that we often know an effort is probably needed before we know exactly what to do.

Crucially, it is not just receiving bad news that is psychologically stressful. It is the implications of the news for future effort that are important. We can also

experience a fight-or-flight response from good news, if it suggests extra effort will be needed.

E.g. Imagine you are watching TV to see if you have won the national lottery. The odds are millions to one against a worthwhile win but you tune in anyway, because you never know. As the numbers are selected you can hardly believe it. Number after number matches your selections. As the final number is revealed you realise you have won a lot of money. Millions. Most people would experience a powerful physiological response in this situation. Pulse racing, sweating, physically geared up and tense, light headed perhaps. Your life has changed in ways you can only begin to imagine so some kind of response is needed.

In this publication, events that indicate that an extra effort is required are called Extra Effort Indicators (EEIs).

EEIs can originate externally, which is where the person receives information indicating an extra effort is probably required.

EEIs can also originate internally, which is when they arise from a person's thinking without new information arriving. For example, the person may realise something through thinking about their situation, or think of something that is an EEI while trying to make plans (e.g. that the plan won't work, that no plan seems likely to work).

Here are some examples of typical types of EEI:

- **Losses:** being fined, losing a bet.
- **Reduced time:** Finding that a deadline has been brought forward, finding you have to do something extra that leaves less time for an important task.

- **Reduced ability:** The computer printer breaking, your computer crashing, feeling ill, not being able to sleep.
- **Bigger task:** Finding there are more items to do than you thought, finding the car park is further away than you thought, discovering you have made a mistake.
- **New task:** Losing your keys, losing a vital document, realising there is something else you need to do.
- **Life change:** Getting offered a good job, proposing marriage, winning a large lottery prize.

In many cases, the discovery or realisation is that things are worse than we thought.

Many of our EEIs arise from the events of a busy day. Others concern our health, relationships, work, money, home, and holidays. Beyond that, most people encounter more EEIs from news media. The events reported may leave us feeling that life is harder than ever, probably because of the government or some other group. Increasingly, many people are aggravated and disheartened by the blatant biases and ploys of the news media themselves.

5. Muscular tension

5.1 The reaction

The persistent muscular tension of interest here includes:

- Tension around the head and neck, often pulling the head down towards the shoulders.
- A general tension around the torso, with lowered flexibility.
- A tense chest with restricted breathing.
- Muscular tension elsewhere.

Chronic muscular tension can also be caused by long hours of typing, for example, but this is from posture and a task, not from 'pressure'.

While the fight-or-flight reaction is controlled by the autonomic nervous system, muscular tension is not. There is also evidence that people sometimes experience muscular tension in a pressured situation without the physiological changes of the fight-or-flight reaction. This issue is discussed by Pleuess, Conrad, and Wilhelm (2009).

5.2 How it can help

There are four potentially helpful effects of this pattern of chronic tension, all broadly protective:

- **Bracing:** In a physically dangerous situation, tension and a lowered head can make you slightly less vulnerable to being hit by someone or something. It helps to protect the vulnerable and vital neck and head.
- **Freezing:** Keeping still is part of hiding and makes it easier to listen for danger.
- **Quieter breathing:** This can be advantageous if you are hiding from danger or if you are listening intently for danger.
- **Submission:** In a social encounter with a higher status individual a lowered head can signal submission to them. This is more obvious in some other species, but bowing and height differences also signal status in human societies.

Clearly, most readers of this publication will rarely have a need to brace against impact, freeze and breathe quietly in a dangerous situation, or signal submission to avoid being attacked by another person. However, evolution has been

going on for a long time during which these have been important reactions.

It is possible that muscular tension is more pronounced when we are thinking intensely and our attention to the outside world is reduced. It may be that bracing is a compensation for being less aware of our surroundings.

Cohen et al. (1992) found that facial muscle tension increased when people listened intently but not as much as when trying to remember digits.

5.3 How it can hinder

Chronic tension in the neck can lead to the most common form of headache: the tension headache. It can lead to poor posture and make moving more tiring than it needs to be. It can also affect the voice, which is a particular concern for singers and public speakers.

Appearing tense can change the way others respond to us.

5.4 Drivers

Feeling that we are in physical danger or facing a social situation (especially involving many people or someone important) can cause these reactions.

Being at school, college, or at work with other people may be sufficient.

6. Intense thought

6.1 The reaction

This is intense, urgent, sometimes persistent thinking about a concerning problem or set of problems. This includes analysis of the problem and development of solutions. Sometimes we find a solution very quickly and easily. On other occasions it takes longer and we may experience this as worry.

This thinking should focus on solving the problems but sometimes people struggle to find solutions and instead ruminate on the harms they fear without making any positive progress. This is also experienced as worry.

It is not strictly necessary for there to be a bad potential outcome that is prompting the intense thought; you might simply have set yourself the task of finding a solution to some problem.

This intense thought tends to involve a sense of urgency and a reluctance to take a break or think about other things. Thinking time and effort are given over to the problem, often at the expense of other things that need to be thought about. Mental rest is also deferred while an effort is made to make sense of events and think about how to make progress.

This intense thought for problem solving is inwardly focused and tends to reduce our awareness of our surroundings.

6.2 How it can help

Dedicating our mental resources to a problem increases the chances that we will understand our situation and think of a good course of action, and soon. Provided this is achieved quite quickly, all is well.

6.3 How it can hinder

However, this intense thinking becomes a negative experience when we cannot solve the problem, cannot rest mentally, and our thinking starts to become ineffective.

We become mentally tired and slow. We get stuck in repeated thoughts that are not making progress. It may be hard to sleep properly, making us less able to think as the days pass.

We may become bad tempered. We also can start to struggle with other, less

pressing problems that are not getting the attention they need. We can become less aware of what is going on around us and less responsive. What starts as one problem can become several as we fall behind.

Sometimes we continue to think about a problem even though we have no realistic chance of finding a better solution to it.

The unpleasant sensations of worry can be more harmful than the problem the worry is focused on. The worry might be immediate, persistent, and debilitating while the problem being attacked is something that is not causing harm now, might not happen at all, and might not be serious.

Each failed attempt to solve the problem is an Extra Effort Indicator that might set off a small fight-or-flight reaction.

We can even begin to worry about the effects of worry, which amplifies the distress. This is called meta-worry. Wells (1995) has proposed a model of generalized anxiety disorder in which worry about worry is one of the mechanisms.

The sense of urgency can affect the way we use our memory resources. In haste we may take less care to:

- select or plan a process for working through the problems
- document our thinking
- build longer term memories by
 - forming them clearly
 - structuring them appropriately
 - using retrieval practice to make them more readily available.

Instead, we may rely on working memory effort, trying to cram as much into our heads at high speed as possible and hoping that solutions will appear.

For example, suppose you had to work out 37×43 in your head. For many people this is tough but possible. Rush at it and you are likely to feel strained, run out of memory space, and make a mistake.

If you are patient you can clarify that the approach involves working out 3×37 , holding the result to one side, then working out 40×37 , holding that result to one side, then add the two intermediate results. You might think $3 \times 30 = 90$, then add $2 \times 7 = 21$, which makes 111.

Hold that as 'first total=111'. Relax for a moment then mentally test yourself, thinking 'first total, 111'. Now move on.

For the second result you need 4×37 , so $4 \times 30 = 120$, add 28, making 148. But it's 40, not 4, so 1480. Now memorise that as 'second total=1480' and test yourself. Then check 'first total, 111' is still available. The totals are 1480 and 111.

Add the 100 first to get 1580. Add the 11 to get 1591. That's the result.

The key point is that, going slowly and carefully, with a plan and careful rehearsal of intermediate results, many people can successfully do this calculation mentally. Rush it and you will probably find you are not sure what the first intermediate result was and then lose it all when trying to add the two intermediate results.

A similar improvement happens if you try to search the internet or books for solutions to a problem with a clear search plan that you extend and memorise as you go.

Unless time pressure is extreme, this kind of patient thinking – relying on building long term memories instead of pushing working memory to its limits – is more effective, more sustainable, and less mental strain. It gives more answers, fewer errors, and more long-term learning.

Another consequence of the patient approach is that it reduces the intensity of mental effort and so produces less muscle tension.

It is not entirely clear why mental effort leads to muscular tension. I suggested earlier that this might be a compensation for lower awareness of our surroundings and so intensify protective muscular tension. However, other mechanisms are possible.

There is evidence that some muscle tension is related to imagined physical actions. It may also be that conscious attention to balance, smooth movement, and relaxed muscles is reduced when we think about other things and that leads to tension, or at least allows tension to build up. It may be that intensifying our effort on a mental task leads us to a generalised extra effort that spills over into tight muscles.

Several ideas were explored by psychologists in the early and mid-twentieth century. This established that muscle tension tended to increase with task difficulty but that there were quite important differences between people (e.g. Clites, 1936; Davis, 1938 and 1939; Hadley, 1941).

6.4 Drivers

The situations and realisations that trigger this intense thought have similarities with Extra Effort Indicators. They include:

- **Surprising events:** When things do not happen as we expect the implication is that our knowledge is flawed. How deep does our misreading of the situation go?
- **Complex events:** Events that involve multiple mechanisms can be more confusing. We struggle to understand them and to decide what to do.

- **Uncertain outcomes:** When there are many possible outcomes we may need more thought to consider them effectively.
- **Unfamiliar situations and tasks:** We struggle more when situations and tasks are unfamiliar and we lack expertise.
- **Persistently unsolved problems:** We can be triggered into intense thought when we encounter a familiar but still unsolved problem.
- **High stakes challenges:** If a lot depends on solving something then we are likely to focus on it more.

Here are some examples:

E.g. Someone you thought of as a friend takes a few minutes to tell you how much they have always hated you. It is a shock and leads to self-doubt and thinking back over past encounters to try to understand how you missed the clues. Are you as likeable as you thought? Do you understand people at all? Is there anyone else who has been hiding similar feelings?

E.g. A computer programmer is getting to the end of coding an important module of an application. Then she realises that she has completely overlooked an important complexity. For a few minutes it seems like the problem may in fact be impossible to solve. She thinks about this for hours and gradually a solution emerges – but it is complicated.

E.g. A family is enjoying a holiday in Italy but gets a message from their travel company saying that the company is bankrupt and the family will have to find their own way home. The parents spend several anxious hours making calls and checking things

on the internet to find a way to get home.

7. Vigilance

7.1 The reaction

Vigilance includes a range of behaviours, ranging from short-term, intense, sensory focus to longer-term sensitivity to particular information.

E.g. We are in bed at home, late at night, when there is a strange noise. We listen intently for more sounds, almost unable to breathe.

E.g. A Battle of Britain fighter pilot over England in September 1940 would have needed to stay vigilant for enemy aircraft. Spotting the enemy early, especially if they were trying an attack from the sun or using clouds, was essential to survival.

E.g. A young man becomes romantically attracted to a girl but for several weeks it is unclear if she returns his feelings. During those weeks he is looking out for any clues to her feelings and thinks intensely about every tiny indication.

E.g. The manager of a small shop begins to suspect that one of her assistants is stealing small items from the shop. She finds herself hyper-aware of everything the assistant does and says, and often notices when theft is mentioned on the news or in conversations.

There is a sense of urgency and a reluctance to attend to other things. Competing mental activity is reduced, including thinking and attention to other information.

There are also some physical changes. Stekelenburg and Van Boxtel (2001) found that listening intently was associated with

reduced heart rate and breathing, and with reduced muscle activity around the jaw. These also improved listening ability. This contrasts with the effects of the fight-or-flight response.

7.2 How it can help

This kind of sustained focus can help to identify important information quickly. It can help when extracting important information from everything else.

7.3 How it can hinder

Vigilance can become a problem when it interferes with breathing, interferes with rest and sleep, or takes too much attention away from other tasks for too long.

We may also become over-reactive to information when we desperately want to know something but evidence arises very rarely and, even then, is unreliable.

7.4 Drivers

Any situation where we are desperate for more information and the stakes are high can lead to vigilance.

The drivers for vigilance are very similar to those for intense thought and there is a grey area where vigilance turns to intense thought as we think intensely about new scraps of information we have found.

8. Characteristics of drivers

The drivers for the fight-or-flight response, tension, intense thought, and vigilance have some interesting characteristics.

8.1 Shared

The drivers of the four reactions are often similar. One challenging situation can set off more than one reaction, sometimes all four.

E.g. In woods at night that rustling in the undergrowth will set off (1) a fight-or-flight reaction, in preparation for fighting or running, (2) vigilance, as we strain to hear more, and (3) tension, as we brace for possible impact and suspend breathing to hear better.

E.g. Agreeing to give a speech to an important audience of over 100 people can set off (1) a fight-or-flight reaction because of the general sense of extra effort, (2) intense thought, as we start thinking about what to say and everything else around this challenging task, (3) tension as we imagine the important people in the audience and instinctively wish to show deference to them, and (4) vigilance as we start to research our topic and seek useful information from many sources, often trying to confirm crucial details.

Although the four reactions are separate from each other they happen together so often that they can seem like a single syndrome.

8.2 Bursty

Drivers for these reactions are not evenly spaced over time. Instead, they tend to arrive in bursts. We might have a few carefree weeks, but then some life event occurs and for weeks we are bombarded with triggering information and thoughts.

If the drivers were nicely spaced out and not too frequent then it would be easier to deal with them. The challenge is that they come in nasty bursts that can overwhelm us.

E.g. Imagine a couple retire and for several years they live happily together. Then the husband unexpectedly dies of a heart attack. For his widow this starts a heavy burst of challenges. In addition to her grief, she is suddenly faced with several

unfamiliar tasks involving hospitals and undertakers. Even if she was not bereaved these would be quite challenging Extra Effort Indicators. Then there is pressure to organize the funeral and some kind of social event afterwards, involving more EEIs. At the same time she also has to learn to do the things that her husband always took care of, including tasks she did not even realise he did. There are probate forms to fill in and tax considerations. She will have to think about downsizing her accommodation and rethinking her financial position. Life for a single person living alone is more hard work than for a couple sharing the load, and that is a frequent source of more EEIs.

E.g. Imagine a young man is preparing to make a proposal of marriage. The proposal itself carries the risk of rejection and all that could imply about his suitability as a spouse and prospects for future happiness. It requires some planning and delicate judgements. Once marriage is intended there may be a wedding to plan and with that comes countless decisions, some tricky, many not anticipated until the professional asks what you would prefer. All this can be costly, and thinking about the financial implications of choices can make them harder. There may be a honeymoon to plan and organize. And has he thought of some romantic surprise for his bride that he can somehow organize without her knowledge? There is also a legal process to comply with, and most people are learning about that for the first time. It's just another few items on a long and ever-growing to-do list. The day of the wedding may also be busy, with potential complications and surprises.

Common reasons for a burst of drivers include:

- Bereavement.
- Injury, illness, disability (yours or someone else).
- Love affairs, proposing, and getting married, separating, getting divorced.
- Power struggles at work and within education (e.g. falling out with a teacher, conflict with a colleague or a group, blame games, being bullied, arguments over whether treatment was fair).
- Finding and moving to a new home, improving it, selling it.
- Legal battles.
- Big projects.
- Financial crises.

8.3 Circles/cascades

Another characteristic that makes situations more challenging is the tendency for our own reactions and limitations to make a bad situation worse, which then intensifies our reactions, and so a vicious circle emerges. Sometimes a person's stress level rises very quickly. Initially they have things under control and they feel calm, yet within a few minutes or hours things have spiralled into disaster and tears.

Here are some causal mechanisms behind this tendency:

Problem discovery: Intense thinking about a problem can reveal more problems, generating more triggers for fight-or-flight and intense thinking. Thinking should usually lead to solutions but this does not always happen.

Limited attention: When we are intensely focused on one challenge we may give too little attention to something else, and so make a mistake. That mistake

increases our challenges. We may simply be overwhelmed with information and problems, leading to mistakes and a worsening situation.

Our attention may become narrow during psychological stress, leading us to miss important but subtle cues. We may be too focused on applying familiar solutions energetically and fail to realise that the solution is not appropriate and we need a creative alternative.

Awareness of this reduced capacity for other tasks can itself be an EEI.

Tiredness: Worry and poor sleep may have left us too tired and/or sleepy to think clearly and function well, leading to poor performance and worsening problems.

Avoidance: The unpleasantness of our feelings may lead us to avoid situations we find difficult, or avoid thinking about them. This in turn can lead to situations getting objectively worse.

Mistaken thoughts: When we are struggling we may be prey to thoughts that make us feel even worse. For example, we may think that things will never get better, or that we are the reason for all our problems, or that one or two bad outcomes mean that all outcomes will be bad. In Cognitive Behavioural Therapy these are known as cognitive distortions. Not only do these make us feel worse, but they are factually incorrect and that can lead to bad decisions that make our situation worse or at least block solutions.

Mood and other effects: We may make further mistakes because of anger or other emotions, inebriation from alcohol or other substances, or pain (e.g. from chronic tension). We may be worried further by the consequences of our own reactions, such as stress-related diseases, harming others, self-harming, suicidal

thoughts, substance abuse, comfort eating, comfort shopping, and compulsive behaviours.

Mental limitations from intense psychological stress: A strong fight-or-flight response can lead to reduced cognitive ability, especially reduced access to long term memories.

E.g. A student in an examination realises he cannot remember something he is sure he revised recently. This triggers a fight-or-flight response that causes reduced memory performance. Realising that memories seem to be fading rather than coming back, the student gets even more distressed.

Because of this risk of a vicious circle a seemingly minor challenge can become much more serious, perhaps interacting with other challenges we usually deal with quite easily.

E.g. A young but dedicated snooker player is practising. Suppose that, for this player, each poor shot produces a little bit of frustration (stress). Poor shots are partly the result of luck, but become more likely when the stress level rises. A run of several poor shots in a row could happen by pure luck, even if the player's level of play stays the same. However, if this bad run leads to stress and a lower playing level then the bad runs are more likely and could be longer. A player who does not understand the role of luck and is too reactive to runs of poor shots could quickly become over-emotional.

This vicious circle effect can also happen in organizations. Each person's mistakes and omissions cause extra work for some other people, setting off a cascade of work and EEIs for each person involved.

Because of these feedback loops it is particularly important to manage stress reactions early and frequently. If the reactions grow they can begin to take over. (This is similar to managing a pandemic, such as the 2020/2021 SARS-Cov-2 virus pandemic: if it starts to get out of control things can get worse very quickly, but if held very low it can seem that there is nothing to be concerned about.)

9. Management of reactions

The reactions have both helpful and unhelpful effects. They can help us in the short term but may be a problem if we overreact or they go on for too long. Often they are instinctive reactions that are appropriate in physically dangerous situations but not in the more typical mentally challenging modern Western world.

9.1 Calming thoughts

The pattern of calming thoughts suggested below involves getting calmer quickly to avoid debilitating and unpleasant over-reactions, then continuing with that calmness while addressing the real-life problems that must still be solved.

The most calming thoughts we can have are those associated with resolving our challenges. If we discover that the rustle in the woods at night is just a bird, work out a great solution to a worrying problem, or learn that our financial problems have just been solved by a big lottery win, then we feel calmer quite quickly.

However, in many situations we do not immediately receive further information that resolves uncertainty and we do not immediately identify a course of action that will solve our problems. Sometimes we never get those.

In the meantime our reactions to the challenges may continue and can become harmful. It helps to get calmer even before we reach solutions.

9.1.1 Pre-solution calming thoughts

This is possible because, even when we cannot resolve our challenges, we can often establish very quickly and easily that the reactions are not necessary, or at least can be less intense. This, for me personally, is a very effective type of calming thought. These can and should be used immediately a challenge is felt.

Pre-solution calming thoughts are rational thoughts that:

- rapidly reduce the intensity of stress reactions
- reduce the extent to which the challenges faced create further stress reactions
- prepare the way for thinking productively about solutions to the problems faced.

At its simplest this involves identifying all the things that are upsetting you and consciously recognizing their nature. You may have noticed how useful this can be.

You can even get quick relief from mild tension by simply noticing that you are feeling a little tense and why that is. For example, 'I am feeling a bit tense because I am not sure when the meeting will start.' Since it is obvious that this minor uncertainty is not really dangerous you should feel more relaxed immediately, especially if you understand the logic explained below.

Before going through several detailed illustrations, here are the basic patterns:

- **Countering the fight-or-flight response:** The key point to consider is whether the effort required is (1) immediate, (2) intense, and (3) physical. In reality, almost always, it is

not physical let alone intense, and no effort is needed right now. Usually we just have to sit quietly and think clearly, and many efforts are required spaced over a long period (e.g. weeks or years). Therefore, the fight-or-flight response is not necessary.

- **Countering muscular tension:** Similarly, we can quickly establish that a situation is very unlikely to require us to physically brace for impact, freeze, suspend breathing, or lower our heads to avoid danger from dominant others. If that is the situation then it is ok to relax, stand tall, and breathe easily. The thought 'I am safe' combined with a look around could be all it takes. Most people are also able to relax at least some muscles deliberately and take a deep, slow breath. This is easier if your body is fully supported (e.g. in a chair or bed).
- **Countering intense thought:** The problems with intense thought stem from the precautionary assumption that an intense thinking effort is needed immediately and must be continued without interruption until the problem is solved. To counter this, consider whether immediate solution is truly required. Often it is not. (For example, it may be a trivial issue, something that is unlikely to be important, or something that we will not be able to act on for days.) Consider if a continuous effort is required or if, instead, separate sessions of thinking with rest periods will be adequate (and probably more productive in the longer term). Get set to think patiently, systematically, and to develop memories along the way. It may also help to get into a comfortable position, establish that it is safe to ignore your surroundings, and deliberately relax muscles.

- **Countering vigilance:** As with intense thought, the problems stem from the precautionary assumption that vigilance is required immediately and must be continued without interruption. To counter this, consider whether vigilance is required now, and if it can be interrupted by rest periods. Usually it can. (For example, it may be easier to plan responses to the potential outcomes of concern without knowing which, if any, will materialize.)

A first step towards pre-solution calming is simply to look around and recognize that you are not in imminent physical danger (which is usually the case). However, I personally have found that this is often not enough on its own.

Typically, I think of several implications of a difficult situation that I am reacting to. These implications are things that might not be visible in my immediate environment. So, it is also necessary to think about:

- All the extra efforts I might have to make, so that I can ensure they will not be immediate, intense, and physical.
- All the dangerous or socially difficult situations I might encounter, so that I can ensure they are not happening now and unlikely to be physically dangerous.
- All the problems I might have to focus on and solve, so that I can ensure they do not have to be solved right now and it is sensible to take breaks from working on them.
- All the issues about which I might be vigilant, so that I can ensure they do not require immediate and unbroken attention. A rest from time to time is sensible.

This is calming, not distressing, particularly as I get towards the end of my search for things I am reacting to. Even if you get to the end of all possible extra efforts and address them all you may still feel distressed. There may be a tendency to think this means there is still something you are worried about that you have not identified. This might not be true. Instead, it may be that the physiological changes in your body already caused are making you feel physically 'stressed' and there is nothing more to it.

It is possible that thinking ahead like this, and establishing that all these possibilities can be tackled calmly, prepares me to be calm in future if they occur. This may be beneficial even when pre-solution calming thoughts have not made me completely calm.

As far as I can tell, scientists researching stress have not yet considered this kind of calming thought and so there is no published scientific test evidence to support its use at this time. However, there is research showing that reappraising initially stressful situations can reduce stress very effectively. For example, if losing your job is reappraised as an opportunity to have a holiday and do some things you have wanted to do for years then stress falls.

Also, for several years I have offered an interactive web page¹ with calming thoughts that repeatedly asks visitors how stressed they feel after they answer questions about the implications of their stressors. The reported stress levels fall considerably despite visitors being asked to think about the stressors. There is a bias introduced by the fact that people whose stress is not reduced are more likely to leave the page and not report further stress levels. This makes the evidence unreliable, but the large extent

of the stress reduction reported would require an extreme bias that I find implausible, having modelled it numerically.

9.1.2 Problem solving

Pre-solution calming thoughts are very useful for gaining some control and reducing overreactions. They involve some thoughts about your possible courses of action, but very general and mostly just excluding some that are not realistic possibilities. These thoughts can be carried out very quickly and easily, and even a thorough analysis takes just a few minutes.

Risk management

Beyond this it is important to start thinking in more specific detail about what is going on and what you could do. Problems need to be addressed. The approach should be a form of skilled risk management.

One good way to start is by considering the worst case scenario(s). What is the worst that could happen, and what could you do to avoid it or cope?

E.g. If the worst that could happen is that a disagreement turns into a physical fight then all you need to do is think of something simple you can do to diffuse the situation if the other person starts to look angry.

Addressing the worst case scenario reinforces the messages from the pre-solution calming and makes it easier to calmly consider other possibilities and go into more detail.

Considering the best case might be a good next move because the best case also often requires a considerable effort.

As you plan, try to think of ways to build in flexibility and opportunities to gain more information.

¹ <http://www.relaxonline.me.uk/sa1/index.html>

The closer we get to a resource limit the harder it is to make plans and to cope when we try to follow the plans. This applies to our time, money, and space in our homes. For example, if you have a very full day then it is more difficult to find time to fit in one more activity. Other activities may have to be rearranged at short notice to accommodate some urgent but unexpected task. If you are making a journey in three stages by train and the connections are tight then it is more likely that you will miss one and be seriously inconvenienced. Similarly, if your room is already very nearly full of stuff then putting things away, getting things out, and finding space for one more thing are all much more difficult.

Try to create 'slack' for all important resources so that it is easier to make changes and cope with the unexpected.

Think about what could be tiring or unsettling and allow time for rest, recovery, and future problem solving. This gives you a better chance of responding well to future pressure and avoiding a vicious circle.

Allow time for more detailed research and planning, so that by the time you start to act you have already found out a lot about the situation you are going into and have committed that information to memory where it can help you in a crisis. This too reduces the risk of being overwhelmed by a vicious circle of problems and over-reactions.

Pay particular attention to the overall challenge you will face in future at different times. In addition to psychological stress, there are other forms of stress that require some kind of recovery by our bodies:

- **Chemical, biological, or thermal attack or deficiency:** e.g. dehydration, nutritional gaps, infection,

wounding, over-heating, being cold, smoking.

- **Doing work:** e.g. digging a trench, memorising 100 words in a foreign language, proof reading for an hour.

The familiar theory is that, if the sum total of our stressors is greater than our recovery capacity, then we begin to crumble.

Problem solving can also reduce the need for sustained vigilance. Depending on what is to be monitored it may be possible to replace continuous vigilance with regular recording and charting, setting alarms, and getting better at making observations quickly and accurately.

Not now

One potential problem as you plan is that imagining future situations and actions itself kicks off reactions because, at some levels, your brain does not clearly distinguish between actual and imagined events.

(If you would like to test this idea then close your eyes and try imagining falling off a cliff or being pushed in front of a speeding train. You will probably notice a slight physical response when you do this.)

To reduce this problem, try to get clear in your mind that the situations and actions you are considering are not happening now. Specifically:

- Be very clear in your mind that possible situations you are considering are possibilities only, not necessarily accepted as your chosen interpretation or prediction.
- Similarly, be very clear that actions are only theoretical possibilities under consideration, not intended actions.
- In your mind, position those situations and actions firmly in the future, at

some specific future time or just not immediately.

Again, these ideas have yet to be considered by scientific stress researchers and so there is no evidence beyond reason and personal experience to support their use. However, there have been studies that show a reduction in stress reactions when people plan for themselves using the language they would use to plan for another person. For example, instead of saying to yourself 'I could jump in' the words would be 'He could jump in' or 'Pete Smith could jump in.' These create a psychological distance that helps to reduce stress reactions (Kross et al, 2014).

Mental simulation

One way that we try to think of things to do (e.g. how to talk to someone about a difficult topic) is by imagining situations and ourselves doing things in those situations. If this mental simulation works out well then, perhaps, this is a good course of action.

Unfortunately, these imaginary situations often do not turn out well and we feel distressed by them because, at some level, our minds do not fully distinguish between what is real and what is imaginary. For example, if our imagined confrontation with another person gets heated and is unsuccessful then we start to feel as we would if that row was actually taking place.

To get better results from this activity, with less distress, we need to do this in a much more controlled way: (1) Think of one or more courses of action (e.g. things to say) that follow a sensible strategy. In other words, you have intellectual, 'in principle' reasons for thinking they are good. (2) Mentally rehearse just those actions, without the imagined reactions of other people or things. (3) Once you are confident and fluent in the course of

action, it may be safe to mentally simulate it in an imagined situation.

E.g. Suppose you are trying to think of a way to ask someone to do something they probably will not want to do. Consider these questions: What are their interests? What do you want? What is it fair and reasonable to ask for? What should the other person consider? What evidence is there that clarifies what is right? What is the best evidence? Is there anything the person might not understand and that has to be explained? Are there any points that need to be in a particular order if they are to make sense? How long is the conversation likely to take (seconds, minutes, hours)? What mood should the other person be in? Would it be helpful to have someone else there? When would be a good time to raise the subject? Do you need to ask permission to start the conversation, even if it is just for politeness? How should you start the conversation? This type of analysis is much more likely to lead to a good approach than mental simulation.

Confrontations and competition

Risk management for competitive situations (e.g. business, war, politics, power struggles at work) is fundamentally different from risk management when there is nobody trying to outwit and beat you. Instead of bad things happening to you by accident, someone is trying to find your weaknesses and use them to damage you. It can feel more frightening and hopeless as a result, especially if you are outnumbered.

This situation requires careful thought about what each side might do and possible reactions. Thinking a few steps ahead may be important.

When an internal power struggle is happening in an organization you will usually need to do these things:

- Gain more information about opponents and get insights into their tactics and overall strategies.
- Find ways to neutralise their attacks.
- Limit information about you – especially your thinking – that is available to opponents. Doubt usually makes opponents more cautious.
- Avoid writing, saying, or doing anything that they can use against you (perhaps taken out of context).

Conflict is harder to deal with when the other person's real motivation and character are unclear. An attack can come from someone who has never been unpleasant before. It could be someone you have had little contact with. For some reason they have come to see you as a threat or obstacle and that is enough.

This can introduce uncertainty of fundamental importance. Are you under attack by:

- an honest, reasonable, fair-minded person who has perhaps just misunderstood something or become over-emotional; or
- a dishonest, unreasonable, unfair person who wants all they can get?

If the other person has honestly misunderstood or over-reacted then sensible responses would include:

- Being open with them.
- Explaining your thinking, including any problems you are grappling with, by way of mitigation or as a way to start a problem-solving conversation.
- Apologising for anything you can, even if it is little or nothing, to show a willingness to repair the relationship,

hoping perhaps that the other person will acknowledge their own role.

But suppose you did these things and the other person was unreasonable and unfair in response?

- They might use information you disclose against you.
- Instead of joining you in problem solving they might say your mitigating circumstances show the motive for your wrongdoing and attack more aggressively.
- Instead of accepting your apology and making one of their own for their role they might use your apology as an admission of sole guilt and attack more aggressively.

If you might have more than one opponent it only needs one to remain attacking to turn your attempt at reconciliation into a serious vulnerability.

Therefore, using an open, conciliatory approach without knowing for sure that you are facing honest, reasonable people is dangerous. It is better to neutralise attacks, contradicting allegations directly and remaining firm, without being aggressive in return.

Some attacks use simple allegations that tend to be paralysing to honest, caring people. A simple, neutralising response is all the more important.

E.g. Imagine a colleague has persistently misunderstood something technical and is heading towards a serious mistake as a result. You have pointed out the misunderstanding but the colleague did not understand and is still heading for disaster. You explain again, as patiently as you can. The colleague then says 'You are such a patronising old bore. Why don't you just leave me alone!'

The risky response to this is to say 'I am sorry you feel that way. Maybe I did not make myself clear. Perhaps we could talk about this over a coffee?' An aggressive reply would be 'I wasn't being patronising, you idiot.' The neutralising but non-aggressive reply (and by far the best) is something like 'I was not being patronising. You have misunderstood something important. The consequences could be serious so I pointed it out to you again.'

E.g. Imagine you have recommended a course of action to your boss who surprisingly does not favour it. You soon realise that he does not understand the issues fully. He may know something you do not but it looks like he is probably mistaken. You start to explain your reasons for the recommendation but he interrupts, saying 'Stop there. Look, your dogmatic attitude is becoming a problem. I want you to work on being more of a team player.'

The risky response is 'Sorry. I really don't intend to be dogmatic.' An aggressive response is 'I am not dogmatic. You are wrong and just saying that to shut me up.' The non-aggressive but neutralising response is 'I am not dogmatic. There are several strong reasons for the recommendation I made and I want to be sure you understand them.'

E.g. Imagine that you have had to talk to an employee about punctuality after they repeatedly arrived at work late. The employee was resentful and you are not sure the importance of punctuality has been understood. The next day you get an email from someone in the Human Resources department saying that the employee has complained about you being racist, saying you also bullied them. This is a

shock and completely untrue but the employee has a different skin colour to you and the email from Human Resources is quite formal. This is a dangerous situation for you.

A risky response would be to email back saying 'I had to talk to the employee about punctuality yesterday and perhaps somehow this created the appearance of racism. I am sure we can just talk this through.' An aggressive response would be 'Racism has nothing to do with it. This lazy, disorganized employee has been persistently late for work and is generally awkward.' The neutralising response is 'There has been no racism or bullying. The employee was late for work on several occasions and I explained that punctuality was important. I am not sure the employee has yet understood this.'

Avoiding cognitive distortions

There are two major challenges when you try to identify and correct cognitive distortions. One of these is the difficulty of identifying those thoughts when you have not verbalised them, even internally. The other is knowing when a thought is incorrect and probably irrational.

To tackle these problems, do not wait to catch yourself having mistaken thoughts. Instead, do the thinking tasks that often produce mistaken thinking in a deliberately rational way. Focus especially on the judgements that are inherently uncertain and, therefore, prone to irrationality.

In particular, try to be deliberately rational when working out:

- the cause(s) of something
- what happened when you were not there to see
- your own effectiveness

- what someone believes or intends
- what other people think of you
- what will happen.

These are all assessments where there *should be* significant uncertainty.

Do not wait and try to identify when you are thinking about these things. Just make those assessments deliberately.

You can usually tell if your initial thought is likely to be wrong with one simple test. If your view involves 100% then it is probably wrong. For example, you are probably wrong if you think:

- you will fail 100% of the time, or succeed 100% of the time
- someone else is 100% good (e.g. moral) or 100% bad (e.g. incompetent)
- you are 100% bad or 100% good
- other people see you as 100% bad or 100% good
- 100% of the people or items in a large group are the same or have a particular characteristic
- something is caused 100% by one factor; or
- you are 100% sure of something.

The truth is almost always more nuanced. Try to state your assessment in a more nuanced way, capturing variations between people and situations, and acknowledging uncertainty.

As you do this, consider and question the evidence you have to help you. A common cognitive distortion is to be very confident in a conclusion despite a lack of evidence.

There are two very common biases in thinking about what will happen in future. One is to be too positive about the future. The other is to be too confident that your prediction is accurate.

For example, a strong optimist is sure that success will easily be achieved. Sometimes people are too negative about the future. A strong pessimist is sure that failure will occur no matter how much effort is made (and probably suffers more anxiety as a result). Both the optimist and pessimist are too confident in their view.

Objective realism is a much better perspective. The objective realist is, on average, neither too positive nor too negative, and also is realistic about predictions, knowing the range of possibilities is wide. Consequently, the objective realist more often has good reasons to take precautions but also good reasons to take action and even to be prepared to exploit the occasional lucky break.

When assessing people it is common to ignore the influence of circumstances (especially when thinking about other people) and ignore the influence of personal characteristics (especially when thinking about ourselves). We have to remember that our behaviour is made less consistent and predictable by the following mechanisms:

- we tend to respond to circumstances, sometimes in quite subtle ways, so if circumstances are slightly different this may change our behaviour
- we learn from experience and behave differently in future as a result
- we make mistakes, forget things, have different levels of energy at different times, and consequently behave differently on occasions, even when circumstances have not changed and we have learned nothing new.

When thinking about the characteristics of people in large groups (e.g. 'women', 'middle-aged people', 'accountants') it is almost never correct to generalise across everyone. For example, there are

glamorous middle-aged people, interesting accountants, mean vicars, kind conservatives, and selfish socialists. There are (almost) always exceptions.

When thinking about causes it is almost never the case that one factor is the only cause and always will be. For example, if you think you will never get promoted at work because a particular boss hates you then you are probably incorrect. Other factors will also influence your promotion prospects. Your own performance may be important, that boss may move on, or start to see you differently, or lose influence over your promotion, or perhaps decide it is politically advantageous to promote you. It may still be wise to seek an alternative position, but be wary of accepting an overly certain model of your situation and future.

Finally, when thinking about what other people think of you it is almost impossible to be sure of anything. People often do not know what they themselves think. They change their views.

9.1.3 Applications to specific scenarios

Here are some examples to make clear how pre-solution calming and problem solving this way work out in practice. The examples have been chosen to cover some commonly occurring challenges and their details may be important to you if facing similar challenges yourself.

The following examples are very small, mild challenges but the same principles and techniques apply in tougher situations. More calming thoughts and problem solving efforts are needed in tougher situations, which would make realistic examples too long to include in this publication.

Small setbacks

Karen is shopping for food at a supermarket and has only about 10

minutes to finish before she meets her friend for coffee at 3.30 pm. Karen likes to be punctual and knows she has a tendency to get distressed when she is late. Time is running out so she feels under some time pressure. When she reaches the bakery she finds the bread she likes is out of stock, so she picks something similar. They also have no crumpets at all, which is a bigger problem because Karen always has a crumpet for breakfast. Instinctively she feels like some kind of extra effort is needed to solve this, like running to another shop perhaps, and a small fight-or-flight response kicks in that she hardly notices.

However, Karen does notice that slight increase in tension and she notices the fleeting and irrational thought 'They never have what I need'. She has learned that being under time pressure can make her needlessly stressed so she begins to calm herself carefully. If she keeps her reactions very low key then this will be easy.

She notices that the lack of crumpets in a time constrained situation is an Extra Effort Indicator. She calms herself with the thought that she will not run anywhere – it is not practical in a busy shopping centre. She just needs to think of her best response to this situation. She still has two crumpets at home so this does not have to be solved today. There is no need for an intense physical effort now. She can just relax.

Also, it is not true that the shop never has what she needs. Sometimes items are missing, and that is all, she points out to herself. Indeed, her basket is already nearly full with other items they did have.

Having picked all the goods she can she heads for the self-service scanners only to find there is a long queue. The other checkout options are even worse

so she decides to join the self-service queue. Time is running out. 'This always happens to me' she thinks.

Karen corrects herself: 'This sometimes happens to me, just like it does to other people.' Again, she reminds herself that she is not going to run and she cannot fight her way to the front of the queue. Right now all she needs to do is stand and relax, which she does. She takes a slow breath and relaxes her shoulders and neck. To manage the risk of being late meeting her friend, Karen texts the friend to let her know the shop is busy and she may be a few minutes late.

When her turn comes to scan her items Karen has no trouble until she comes to pay. The machine says her debit card has not been recognized. She takes it out, gives it a clean with her sleeve, and tries again. Still not recognized.

At this point Karen is starting to feel a bit frazzled but she quickly catches herself and recognizes that this is making her think about being late for her coffee meeting and about having to do something to sort out her debit card. Also, the woman at the next scanner has noticed her difficulty and that feels a little embarrassing. These are typical, everyday EEIs and the responses to all are bound to be non-physical. She has already texted her friend. Sorting out the card is certain to be a mental challenge, not a physical one. Karen decides to try it one more time then move on to her credit card instead. The credit card works. She can call the bank about the debit card later. The woman at the next scanner is not someone she knows so there is no action to take. Karen relaxes her neck and shoulders because she is physically safe even though it felt like people were looking at her. She reminds herself that being four minutes late for coffee with her

friend will have minimal consequences, particularly as the friend will be waiting comfortably on a sofa.

As Karen leaves the supermarket she plans a simple apology to her friend and heads to the coffee shop. Meanwhile, her friend is ten minutes away chatting to someone else, having completely lost track of time. Karen will arrive at the coffee shop first, as usual.

Preparing for a challenge

Sanjay has been working on a difficult and important document and has given a draft to his supervisor for comments and suggestions. The supervisor will be returning the draft later that day, probably with many supposed 'corrections', requests for more work, and other issues. This supervisor is quite demanding and not very polite. Although he does not realise it, the supervisor is not a good writer and is sometimes wrong or unfair in his criticisms and demands.

Sanjay is not looking forward to this and is aware of his own tendency towards perfectionism, meaning that he tends to focus on what is wrong or incomplete even in situations where these flaws are insignificant. Sanjay is trying to become more selective and focus on perfection only when it is worthwhile. He knows he needs to stay calm, especially as there will be a lot of work to do later

When the supervisor's feedback arrives it will be bristling with Extra Effort Indicators, such as demands for extra work and some errors identified. Some comments may be insulting, harsh, or perhaps patronising. There might also be some points that Sanjay will want to argue about, so that could mean confrontation and a persistently difficult relationship with a difficult person. Sanjay could experience a fight-or-flight response,

muscular tension because of the confrontation with a higher status person, and intense thinking about how to fix the problems with the document and how to tackle a confrontation over some of the feedback. Just thinking about the arrival of the feedback is giving him an unpleasant feeling.

To reduce this feeling and prepare for later, Sanjay does some pre-emptive calming. First, the feedback is not here yet so there is no need for any immediate reaction. When it does arrive there is no realistic chance of having to fight or flee. He will just have to think, do some typing, and maybe some talking (which is as physical as this can get). Even though the supervisor is higher up the company hierarchy, there is no need to show deference by body language and no danger of a physical attack. Sanjay just needs to get physically comfortable, relax, and think.

If the feedback calls for some extra material or restructuring he can do this by thinking calmly and typing. If the feedback points out some of Sanjay's errors then the only response required is mental: check the items, type corrections, learn any lessons. Sometimes errors can be embarrassing. They might be very silly, very important, or perhaps persistent errors he has made many times in the past but only now recognises. Thinking about all those past errors can be unpleasant. But, even with such errors, the worst that can happen is that he may have to do more to improve his reputation among colleagues. The effort will be spread out over weeks and will be entirely a matter of careful thought and perhaps some conversations. This is very unlikely and, even in the worst case, will not require an immediate, intense, physical effort.

If Sanjay's supervisor visits him rather than just sending feedback, Sanjay will not need to duck his head or brace for impact. This is not a physically dangerous situation, though Sanjay's relationship with the supervisor might be at stake in some small way. Sanjay relaxes his neck, shoulders, and back.

To limit the downside, he does some planning. He is about to start fantasizing about an argument with the supervisor but catches himself just in time. He plans using his intellect rather than his imagination.

He decides not to dispute any of the feedback until he has given it careful thought and made all the corrections he agrees are worthwhile. He will also think of better solutions, if he can, before discussing any of the supervisor's feedback with him. This will minimise the risk of unnecessary argument.

Sanjay also decides that, no matter how insulting the supervisor's comments are, he will simply respond by writing new words, where necessary, and letting his work be its own defence. If his words need some justification then he will explain only if his supervisor does not accept the revised words. If any of Sanjay's explanations are not accepted then he will simply do what the supervisor wants on those points.

He carefully considers this last point, making sure he understands that a few blemishes due to bad ideas from his supervisor are very unlikely to make a difference to the overall impact of the document when it is completed. Perfection is not important on this occasion.

Sanjay has nothing planned for the evening except for dinner and some internet browsing, so if there are still issues to think about he will have time to do that and have a relaxing walk.

Feeling calmer and slightly refreshed, Sanjay starts clearing some emails then goes to lunch, having put the supervisor out of his mind. When the draft returns by email later that afternoon, Sanjay sees it is bristling with the usual red text and rude comments, but he hardly experiences any emotion at all. His preparation helps and he easily stays calm and settles down to revise the draft.

Recovering from a shock

A female work colleague Robin has known for a while and thought of as friendly and mature suddenly tells him what she says are her 'real feelings'. She says he is a transparently false person and selfish. He is a joke and a fool. Not only is that her opinion, but everyone else thinks so too. She says Robin knows nothing of this because he is self-centred and has no understanding of other people. She lists things he has done that he is proud of and says people see them as pathetic proof of his weak and immature character. She finishes saying 'I thought you ought to know.'

If you want to undermine someone's self-confidence this is just about the perfect way to do it. Most people would be deeply affected by such an attack even if the only true part was that the attacker doesn't like them.

The main reactions likely are a fight-or-flight response to the Extra Effort Indicators and intense thought. There might also be some vigilance in looking for evidence about how other people think of you.

Robin is not used to this kind of attack and immediately feels distressed. However, he starts some calming thoughts before even beginning to consider if there is any truth in this attack. To counter the fight-or-flight response, he

considers if the situation requires an immediate, intense, *physical* response. It does not. Beating the speaker senseless is illegal and pointless. Some effort is probably needed to think through what has been said and perhaps get evidence as to whether it is true or not. However, that requires calm reflection and is best done in a state of mental calm and quiet.

It is possible that there is some truth in the allegations, so effort might be needed to improve himself and re-build a decent reputation. Then there's the possibility that his attacker will run off to repeat what she has said to other people, increasing the damage. More quiet reflection required. Contacts with others will need to be calm, dignified, and pleasant to rebuild any damage so no need for fight-or-flight there either.

It is also possible that this is just the start of a sustained attack and power struggle. Maybe this was meant to lower Robin's self-confidence and make him vulnerable. He will need to think through the possibilities but, again, this is not a physical effort.

To counter worry, he considers if all this thinking needs to be done now and without interruption. No, not really. It is probably better to take some time to calm down then schedule a session to think through the evidence carefully and objectively. This is not the sort of thing one can expect to resolve in one session and it might be that encounters with people in future will provide more information. This is something that will need to be tackled over a period of time so it will be wise to rest in between and get on with other things.

So, he makes a note in his diary to think about the issues raised later that evening and again the next day, when it is more convenient.

Robin still feels a bit distressed, though less so now, but thinks this is probably just the after-effects of a fight-or-flight response and not an indicator that there is anything further to respond to.

Since he has a little time now, he settles down, takes a few slow breaths, relaxes his muscles, and focuses on the issues. He decides to think about the worst and best case scenarios first. What is the worst it could be? She could be right. OK, check the evidence for that first, and consider what can be done to head off the worst reputation damage. The worst would be if he got upset in front of people, because this would tend to add weight to the allegations. Robin resolves to look calm no matter what.

At the other extreme, it is quite likely that this is just an attempt to hurt him or to hold him back in some way. In that case, there would be nothing more to do and his plan to study the problem in more detail later without getting distracted now is confirmed.

Protracted uncertainty

Mark is unemployed and his money is running out. He has been interviewed for a great job and the recruiting agency thinks he has a good chance – perhaps the best of any candidate. However, the employer is slow to make a decision and Mark has been waiting for a week. If he gets the job then his problems are solved. If not, things look pretty bleak. Every day people ask him ‘Have you heard anything yet?’ The phone rings – but it's not for him. His spouse looks worried most of the time. He looks through job sites for other jobs but there's nothing today. He goes back over the recent interview and the feedback from the agency. What is the decision going to be?

‘Worry, worry, worry. What to do, you know?’ as my old Polish landlady used to say. Situations like this can lead to intense thinking, vigilance, and repeated, mild, fight-or-flight responses.

This kind of situation can go on for a long time, making it dangerous unless you clear up the uncertainty about responses quickly and conclusively.

However, Mark has been managing his reactions carefully since the first day. He understands that keeping stress reactions appropriately low from the very start is the ideal approach and avoids the risk of a vicious circle developing. He also knows that learning effects will help him as he repeats calming thoughts from one day to the next.

So, while other people have seemed anxious he is not. Each day he reminds himself of the reasons he can remain calm and just carry on with his job search and finding ways to save money. Each day that has become a little easier.

He knows that there is nothing he can do now to alter the company's decision. Also, whatever they decide he will not need to make an immediate, intense, physical effort. There is little point trying to guess the outcome but he has judged his chances at about 40% probability of getting the job, all things considered.

Mark has achieved further calm through planning and action. He has covered the downside risk of not getting the job by continuing to hunt for another one as effectively as he can. There was nothing new today but he has made four other applications since the interview. He has calmed his spouse and assured people that he will let them know when he hears something. When the phone rings, he reminds himself that, whatever the result, the only responses required from him will be careful reappraisal of his job hunt, or modest re-planning of his life for the new

job. Both will require calm consideration and he will have days in which to do that thinking.

When he receives notification of the interview result, even if it is by telephone call (rather than email or letter), his only required effort will be to listen and take note of any details provided. Mark plans to thank the caller, no matter what they say, and avoid getting into a longer conversation.

9.1.4 Some typical challenges

Identifying the reasons for your stress reactions gets easier with practice, particularly since our stress tends to be from quite similar activities from one month to the next. There are also some activities that many people experience that are often drivers of psychological stress reactions.

Here are some activities relevant to many people with notes on their typical drivers of psychological stress reactions and management priorities.

Journeys

Journeys, especially journeys made for the first time, can be challenging because of problems on roads or with public transport. I personally have walked along rail tracks from a failed train on two occasions but this is nothing compared to the hardships endured by many people most years as they try to return home from a holiday abroad. Missing connections is a particular hazard.

The planning has you thinking about possible problems so it is important to position this firmly in the future. Use your intellect to plan and prepare to be calm in a variety of potential problem situations. These include delays, missed connections, breakdowns, discomfort (too hot, too cold, nausea, headache), lost luggage, getting lost, arriving late, and being too late to do whatever it was you were travelling to do.

Prefer travel plans that give you options if one route is blocked or delayed.

One unusual feature of travel delays is that, occasionally, it can help to make an intense physical effort. This could be you running from one train platform to another to catch a train. However, remind yourself that this effort is not needed until your train pulls in at the station. At that time you can get physically geared up to move fast. Until then you can relax as lazily as you like.

Confrontations

When we confront someone over their behaviour, or someone confronts us, we often feel considerable pressure. This is a classic situation where instinct says there is physical danger but in the modern world, if we are at least reasonably polite, we are almost always physically safe. The fight-or-flight reaction and muscular tension can stand down.

In advance of a confrontation there is often intense thought to prepare, and more intense thought afterwards as we process what has just happened. This can be done in a controlled, planned way if it is predictable, which it usually is.

Plan the conversation in an intellectual way rather than by mental simulation in your imagination, carefully designing it to be low-key but focused. Plan to be firm and persistent but avoid insults and aggression if you want good results. This also keeps your stress down.

Struggles for power and survival

Many confrontations are part of an ongoing series of confrontations with the same person or group of people, often over the same issues. These can become highly charged, with both parties thinking carefully about their tactics. Sometimes those tactics can get nasty. They can also become bitter struggles for power or simply survival.

At work you may find yourself in a corporate war zone for a variety of reasons:

- You have risen higher up an organization.
- One or a few individuals are persistent 'politicians'.
- The organization has developed a culture of power struggles².
- The organization is going through a period of more intense struggles e.g.
 - change is needed but being resisted
 - there is a fight over direction
 - there is general chaos
 - two senior people are battling and people are aligning behind them
 - a merger has taken place
 - the organization is doing badly financially and people are scrapping over what little money is available.

The issues and remedies are similar to those for ordinary confrontations, but the battles can be more complex, more cunning, longer term, and more wearing for everyone concerned.

Reputation damage

A very common fear in social situations is that your reputation will be damaged in some way. Public mistakes, particularly in front of many people, people you know, and important people, can be particularly upsetting.

The extra efforts involved include any immediate action needed (e.g. apologies, explanations, corrections), rebuilding your reputation, and reviewing your

² I spent several years working at the main London office of PricewaterhouseCoopers, a huge consulting and audit firm. It was stressful almost every day because entrenched political behaviour and naked greed had engulfed too many people, especially at more senior levels.

performance to understand what went wrong (if anything) and how to improve in future.

In all cases there is nothing you can do with an immediate, intense, physical effort. It is always better to be calm, patient, and low key. You may need to act immediately but not physically. Rebuilding your reputation and reviewing your behaviour will require consistent, calm, focused efforts over a period of time.

Rejections

Typical examples of this are being rejected by a potential lover or employer. The setback itself is an Extra Effort Indicator if you think you could still be accepted with one more effort, and because you usually still want a lover or a job.

In addition, it makes you wonder just how attractive or employable you are. That implies some extra effort to remedy any problems there may be with yourself or your ability to convince others of your merits.

Consequently, rejection usually hits hardest at people who have few opportunities.

Technical challenges

Very difficult mental challenges such as writing software, advanced mathematical reasoning, complex legal cases, innovative engineering projects, and some types of scientific research can cause considerable psychological stress.

In addition to heavy mental work and, often, long hours, there can be a tendency towards intense thinking that does not switch off. Fatigue is intensified and productivity falls. Other things in life can be neglected.

Genuine rest breaks and sensible pacing are important for overall productivity in the medium and long term.

If working a very long day for a deadline is necessary then so is some extra time off immediately afterwards to prevent further decline.

Bereavement

Bereavement is, probably, something that causes us a very special form of distress in addition to the four discussed at length in this publication. Sadly, on top of that we are confronted with a stream of Extra Effort Indicators.

Many people today die after a long illness. That is hard for the sufferer but also for their loved ones, who may be making frequent visits to hospital and facing decisions about healthcare.

Immediately after death an official administrative process begins that few people are familiar with. It involves making decisions, answering questions, and signing forms. A funeral of some kind has to be arranged, probably with a social gathering to follow. That needs a venue, catering, invitations, and so on. This is a lot of work and would be challenging for someone who is not mourning a loved one. Hopefully there are people who can help out.

Once the funeral is done the really hard work of learning to live without the other person can begin. This is particularly tough when one of an elderly couple dies. The survivor now has to learn to do the things their spouse used to do. Living with others is easier for practical reasons because tasks can be shared. A person living alone has to work a bit harder just to get the simple chores of life done.

None of this requires an immediate, intense, physical effort but it does require energy and, often, a lot of thinking. However, even in the most intense periods there are at least a few minutes to rest from time to time. The professionals in hospitals and elsewhere deal with the

administrative issues every day. They know what to do and are used to the difficulties the bereaved experience. You do not have to have answers to everything immediately.

If the person who has died has done some of the planning already and left notes then this is helpful.

Major life changes

Beyond bereavement, other major life changes bring streams of Extra Effort Indicators. These life changes include changing schools, leaving home, starting a new job, moving house, moving to a different country, moving in with someone, and starting a family.

The first few weeks at university are, for many young people, their biggest life change up to that point. They have left home, moved to a new part of the country or even a different country, joined a new social scene, and started a new academic course, perhaps in a subject that is relatively new to them. If they tackle this by throwing themselves into everything new, without allowing time to rest, and without proper sleep or exercise then the experience can be overwhelming.

All the psychological stress reactions are likely to be set off by this level of challenge.

Major life changes create innumerable new problems to be solved, some simple but some very difficult. They need to be planned with care to allow time for thinking and for rest.

It can help to be mentally prepared, for example by studying a map of the place you are going, checking out key people you will meet by searching the internet, or learning about the biology of pregnancy and related health advice.

Illness

Illness combines non-psychological stress (e.g. immune system fighting a virus, recovery from a wound) with psychological stress reactions arising from extra tasks (e.g. hospital visits, daily exercises, remembering to take multiple medications) and reduced capability (e.g. feeling very tired, nausea, not being able to perform some movements).

Fortunately, most of us are lucky enough to have people who will care for us. It is also well understood that an ill person should be resting.

Stress management is more difficult with stress-related headaches. When these are not too severe we often feel obligated to keep on working and hope that medication will reduce the pain and prevent things getting worse. Typically we will not be as productive as usual and may have to stop working for periods of time. This puts us further behind with tasks and increases the pressure to work when we can. A nasty cycle can develop where a person is repeatedly recovering from a headache only to develop another one soon after.

The only way out is to reduce the psychological stress reactions – which are not necessary for most workers – and break the connection between working and headaches. In the case of the most common tension headache the problem is in chronic tension in the head and neck, both front and back, that causes soreness over time. So, managing muscular tension is particularly important.

Academic assignments

Academic assignments such as essays and mathematical problem sheets naturally prompt intense thought because they are designed to push students into new learning. Extra Effort Indicators include struggling to understand the question, not being able to find relevant references,

getting stuck on a problem, realising you misunderstood the task, and computer problems.

This inherent challenge can be made worse by the common student errors of starting assignments too late and being sleepy from late nights.

Obviously the effort required is mental, not physical, and the effort has to be paced over several days (usually). Start as soon as you can and focus on those aspects of the task that create the most uncertainty. It may be possible to reduce intensity after that initial effort. Aim to finish a good first draft with time to spare so that it can be read and refined. This often makes a lot of difference to the quality of the final submission.

Academic examinations

Exam preparation is, for many students, a stressful period. The examinations themselves are worse. Getting your results is the final, often unpleasant, part of the overall experience.

Studying and revising are inherently tiring because of the mental work involved. The stakes are high. Typical Extra Effort Indicators include feeling sleepy, doing badly in a mock test, not being able to understand something you know is important, not being able to remember something despite effort, repeatedly trying and failing to find a way to study a topic effectively, realising you are fighting to get yourself to do any work at all, and discovering there is only a week to go.

It is crucial to get enough sleep (more is needed when you are learning intensely), pace your efforts, and remember that none of the effort is physical. Sitting quietly and thinking calmly is all that is needed. Physical activity is a pleasant break that helps keep you healthy and awake.

Most people will benefit from planning their mental approach during examinations in some detail. Identify potential triggers and plan the thoughts that will help to keep you calm yet focused. For example, what will you do if you cannot answer a question that you cannot avoid? When can you take a 30 second break to relax your mind completely during the exam? What will you do if you feel panicky?

Why is receiving exam results so often stressful? It looks like there is nothing more you can do to influence the results so where is the potential effort? The potential effort lies in:

- Deciding whether to challenge the results, and potentially doing so.
- Reacting appropriately, if you do not want to be insensitive to others around you.
- Explaining your results to other people, which may be harder if they are poor results.
- Changing your plans if the results are very different from your expectations. In the case of UK A levels the wrong result can mean having to take urgent action through 'clearing' to find a university course at short notice.

None of these is a physical effort and even in the worst case there is little that has to be done immediately.

9.2 Deep relaxation

Many methods for relaxing deeply have been developed. This goes beyond just listening to music or reading a novel. The idea is to bring about a physiological response that is, in a way, the opposite of the fight-or-flight response.

Typical ingredients of these methods are:

- Reduced sensations (usually from being quiet and still in a restful environment)
- A relaxed posture (lying down or seated)
- Reduced or regulated thinking (either not thinking or repeating simple thoughts or sounds)
- A focus on relaxation and not struggling
- A session lasting 15 to 30 minutes.

Well known examples include Autogenic Training and the simplified adaptation of Transcendental Meditation developed by Dr Herbert Benson.

These methods certainly leave one feeling well rested, but there is also evidence that they help to reduce at least some of the longer term negative physiological effects of stress. Reviews of past studies include Seo et al (2018), Stetter and Kupper (2002), and Ernst and Kanji (2000).

One reason for this could be that during relaxation sessions the person is not experiencing or thinking about drivers of psychological stress reactions. However, it seems likely that the beneficial effects of relaxing deeply go beyond mere distraction.

9.3 Exercise

There is some evidence that physical exercise of various types reduces the risk of being diagnosed with depression or an anxiety disorder, and that it reduces symptoms of depression and anxiety. The effect for depression is stronger than for anxiety (Rebar et al, 2015). There is also evidence that it helps people who have been diagnosed with depression or an anxiety disorder (Stubbs et al, 2017).

It is thought that these effects probably have multiple mechanisms. Again,

distraction may be one of the mechanisms.

9.4 Other methods

Of course there are also other ways to reduce psychological stress.

One important approach is to do less. Learn to say 'no', focus on just your main priorities and let other things go, take regular rest breaks, catch up on sleep, have days off, holidays, and so on. Many people try to do too much and reducing demands is a good idea but at other times we could do more if we responded to stressors better.

Another approach is to avoid or ignore stressors. For example, Mindfulness Meditation is a practice that involves observing one's own thoughts and emotions, and letting them pass. It encourages people to avoid continuing to think about distressing stimuli and topics. As Ortnier, Kilner, and Zelazo (2007) have shown through both a correlation study and an experiment, it is effective in doing this.

Distraction can help but, as discussed further below, should not continue for long because the problems often remain and need to be addressed in some way.

Sometimes our distress has become powerfully associated with particular stimuli (e.g. spiders, open spaces) and it can help to use a therapy that breaks that association, such as systematic desensitization or flooding.

In social situations, or at any time, it may help to adopt expansive postures. Spread yourself out like a high status person might.

Take some time to reflect on good things about your life, to be grateful for what you have, or to think about good things that might happen as well as bad things.

Finally, there is medication.

10. Learning effects

10.1 Helpful learning effects

When we face similar challenges repeatedly over time we usually become less distressed on each occasion as we gain experience. A number of effects involving learning allow this.

One of the simplest is habituation of our senses. As we are exposed to the same stimulus repeatedly our brains usually become less excited by it each time.

Another effect is that we learn what to do to respond and achieve good outcomes, and we choose those responses more quickly and with less effort. This means that there is less time for a precautionary fight-or-flight response to build up before we know our (usually not intensely physical) response. We also get better outcomes and so fewer Extra Effort Indicators.

Taking in information more quickly and easily (as a result of practice in the situation) makes problem solving easier. Processing is easier and we experience less worry.

Finally, we learn that very few situations within familiar challenges require an immediate, intense, physical effort, and that the better state to be in is calm focus.

Provided each experience with a challenge is relatively calm and ends calmly we tend to get over any distress we might initially have experienced.

10.2 Unhelpful learning effects

However, if each experience with a challenge is distressing and ends while we are still distressed, the usual pattern may be reversed. Instead of getting calmer with experience, we may become more traumatised.

11. Mistakes in managing reactions

There are some common mistakes in managing stress reactions.

11.1 Prolonged avoidance

One way to avoid feeling distressed is to avoid thinking about challenging, upsetting problems we have not yet solved. We might do this by distracting ourselves with other activities or entertainment, or stop thinking while we do a relaxation exercise such as meditation.

As long as we can avoid thinking about the problem we feel calm, mostly. If the problem resolves itself or someone else helps us then this may be enough.

However, the problem can also remain unsolved and continue to be distressing every time it comes to mind.

Pre-solution calming thoughts that make such problems less distressing are a better response to them. Even if we cannot think of a solution we can at least reduce our distress. Also, if we find a problem less distressing it is easier to think productively about it and a solution is more likely to be found.

11.2 Responses requiring physiological recovery

Some things that people do when distressed require physiological recovery. These include drinking alcohol, smoking or otherwise taking nicotine, other drugs, over-eating, self-harming, and physically tiring activities taken to extremes.

There is a risk that the physiological recovery required will take resources that could have been used for more productive uses and for recovery from stress reactions.

11.3 Responses with other damaging side effects

Some reactions to stress have other damaging effects that create further reasons to be distressed.

- Over-eating can lead to obesity, itself upsetting to most people.
- Alcohol and other intoxicating drugs can lead to mistakes and addiction, damaged relationships, and so further worries.
- Smoking is damaging to health, expensive, and makes a person less attractive.
- Self-harming is distressing to loved ones and can lead to scarring and infections.

12. Individual differences

People differ considerably in their stress reactions to seemingly identical situations. These individual differences have been studied scientifically and a number of factors have been shown to be important.

There are probably inherited, genetic differences. If you suspect that you may have a genetic tendency to respond poorly to challenging situations then you should dedicate more time and attention to coping strategies.

12.1 Experiences

It also appears that being exposed to your mother's stress while in the womb makes a person more reactive to stress later. Being exposed to adversity during early life, puberty, and at other times also seems to increase reactivity.

These points are usually made in terms of brain systems and chemicals. However in everyday learning terms we would say that the person's brain has correctly learned from experience that life is tough

and the future is not bright. With that experience, reactions that gear up for tough challenges just in case *should* be stronger.

Traumatic experiences can lead to anxiety disorders such as Post Traumatic Stress Disorder. These often include a heightened sense of danger in everyday life. Again, this is a reasonable reaction to experience.

However, for many people in this position their new level of general fear is unreasonably high. Perhaps what happened to them was a very rare occurrence and there is no reason to think it is now more likely than it was before. Perhaps their lives have changed and they now face less danger than they once did (e.g. moved to a new location). Perhaps there is danger but not enough to justify covering at home all day, or being constantly anxious. A goal should be to gather reliable evidence on the real level of danger faced and adjust expectations to be more reasonable.

12.2 Strengths and weaknesses

Beyond that, people who have generally more cognitive ability are more likely to spot patterns, more likely to identify possible dangers, but also more likely to solve problems quickly and effectively. (The scientific evidence on this so far is ambiguous.)

If you are highly intelligent it may be helpful to focus on getting better at solving problems to avoid being overwhelmed by your projections about the future.

People vary in how rational they are, to some extent independently of IQ, and this may also be related to stress reactions. Being rational is the opposite of the cognitive distortions that can contribute to unnecessary distress.

Perfectionism is another pattern that can increase stress reactions. It can involve behaviours such as these:

- *Over-tight plans:* Trying to make good use of every second by packing activities in tightly tends to lead to plans that fail in reality. Because things happen that were not expected, plans usually need some slack and flexibility. Trying to hold to a tight plan, or adapt one quickly, as events unfold unexpectedly is immensely challenging. Knowing you have a tight plan also makes every possible hitch a more potent Extra Effort Indicator.
- *Over-complex preparation:* Preparing for events in detail is generally a good idea, but sometimes there is only so much you can remember. For example, detailed planning for a negotiation is good, but not if the plans are so complex that you cannot remember them during the negotiation. These bring anxiety about forgetting the plan and errors during the negotiation.
- *Excessive concern over flaws:* Sometimes it is necessary to achieve perfection before something works properly (e.g. a clock mechanism). This is typical in engineering. Driving for perfection in these situations is entirely justified. However, in other situations there is an ideal approach but it is impossible to know what it is so any reasonable guess should be equally acceptable. The perfectionist may carry on trying to find the best approach even when there is no way to identify it. In other situations, if we get the high priority things right most of the rest adds very little. Yet a perfectionist may still try to get everything perfect even in these situations. A perfectionist may also continue working to mitigate ever more remote and trivial risks.

If you have perfectionist tendencies it may be helpful to be more aware of when perfection is worthwhile and when it is not.

12.3 Learning and skills

Also, the learning effects described above should also be responsible for some individual differences.

People who are well able to solve the problems in their lives and/or can calm themselves mentally will suffer less from psychological stress reactions.

12.4 Temporary susceptibility

Finally, people currently brought low by illness, fatigue, sleep loss, or an uncomfortably hot or cold environment are more likely to be susceptible to the negative effects of psychological stress reactions.

13. Conclusions

The complex experience of 'stress' can be analysed into four main reactions, each of which is helpful, up to a point, but can lead to problems too. These are, to some extent, precautionary and evolved in times when life was physically more dangerous than it is today in advanced countries.

We can calm ourselves using our thoughts, if we understand the drivers for our reactions and use our ability to think rationally. Instinctive, precautionary over-reactions can be reduced to manageable, justified reactions.

14. References

Clites, M. S. (1936). Certain somatic activities in relation to successful and unsuccessful problem solving. Part III. *Journal of Experimental Psychology*, *19*(2), 172.

Cohen, B. H., Davidson, R. J., Senulis, J. A., Saron, C. D., & Weisman, D. R. (1992). Muscle tension patterns during auditory attention. *Biological psychology*, *33*(2-3), 133-156.

Davis, R. C. (1938). The relation of muscle action potentials to difficulty and frustration. *Journal of Experimental Psychology*, *23*(2), 141.

Davis, R. C. (1939). Patterns of muscular activity during 'mental work' and their constancy. *Journal of Experimental Psychology*, *24*(5), 451.

Ernst, E., & Kanji, N. (2000). Autogenic training for stress and anxiety: a systematic review. *Complementary therapies in Medicine*, *8*(2), 106-110.

Summary review available at:

<https://pdfs.semanticscholar.org/b55c/caf3f0b07d98aa805a7d3358a1535f3ed37f.pdf>

Hadley, J. M. (1941). Some relationships between electrical signs of central and peripheral activity: II. During 'mental work.'. *Journal of Experimental Psychology*, *28*(1), 53.

Kross, E., Bruehlman-Senecal, E., Park, J., Burson, A., Dougherty, A., Shablack, H., Bremner, R., Moser, J., & Ayduk, O.

(2014). Self-talk as a regulatory mechanism: how you do it matters. *Journal of personality and social psychology*, *106*(2), 304. Available at: <https://rascl.berkeley.edu/assets/files/self-talk-as-a-regulatory-mechanism-how-you-do-it-matters.pdf>

Ortner, C. N., Kilner, S. J., & Zelazo, P. D. (2007). Mindfulness meditation and reduced emotional interference on a cognitive task. *Motivation and emotion*, *31*(4), 271-283.

Pluess, M., Conrad, A., & Wilhelm, F. H. (2009). Muscle tension in generalized anxiety disorder: a critical review of the literature. *Journal of anxiety disorders*, *23*(1), 1-11. Available at:

http://philosonic.com/michaelpluess_construction/Files/Pluess_2009_Muscle%20Tension%20in%20Generalized%20Anxiety%20Disorder.pdf

[20Anxiety%20Disorder%20-%20A%20Critical%20Review%20of%20the%20Literature.pdf](#)

Rebar, A. L., Stanton, R., Geard, D., Short, C., Duncan, M. J., & Vandelanotte, C. (2015). A meta-meta-analysis of the effect of physical activity on depression and anxiety in non-clinical adult populations. *Health psychology review, 9*(3), 366-378.

Sapolsky, R. M. (1998). *Why zebras don't get ulcers: An updated guide to stress, stress-related diseases, and coping*. W H Freeman and Company, New York.

Seo, E., Hong, E., Choi, J., Kim, Y., Brandt, C., & Im, S. (2018). Effectiveness of autogenic training on headache: A systematic review. *Complementary therapies in medicine, 39*, 62-67.

Stekelenburg, J. J., & Van Boxtel, A. (2001). Inhibition of pericranial muscle activity, respiration, and heart rate enhances auditory sensitivity. *Psychophysiology, 38*(4), 629-641.

Stetter, F., & Kupper, S. (2002). Autogenic training: a meta-analysis of clinical outcome studies. *Applied psychophysiology and biofeedback, 27*(1), 45-98. Summary review available at: <https://www.ncbi.nlm.nih.gov/books/NBK69422/>

Stubbs, B., Vancampfort, D., Rosenbaum, S., Firth, J., Cosco, T., Veronese, N., Salum, G.A. and Schuch, F.B. (2017). An examination of the anxiolytic effects of exercise for people with anxiety and stress-related disorders: a meta-analysis. *Psychiatry research, 249*, 102-108.

Wells, A. (1995). Meta-cognition and worry: A cognitive model of generalized anxiety disorder. *Behavioural and cognitive psychotherapy, 23*(3), 301-320.