

Child Trauma, Possible Relationship or Chronic Physical Symptoms as an Adult

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8. Trust is learned early.

- 8.1: Early childhood attachment styles can affect trust as an adult.
- 8.2: Attachment styles can be modified with therapy, but not easily.
- 8.3: Types of Attachment Styles.
- 8.4: Consistency helps build trust at home or in the workplace.
- 8.7: What is normal? What you were used to as a child.
- 8.8: Additional Resources regarding Attachment Styles.

9. Friendliness helps.

- 9.1: Friendliness helps create trust for staff and customers.
- 9.2: Stress can lead to anger which can lead to violence.
- 9.6: Gratitude and friendship boost dopamine, so does shaming.
- 9.7: Food, fun, art, music and laughter - all pleasant ways to increase dopamine.
- 9.7.1: Social control through shaming has been found to be ineffective.
- 9.7.2: We may work best when groups have fewer than 150 people.
- 9.7.3: Emotional connections increase oxytocin and positive mood.

G3. Relaxation and Stress.

- G3.2: Thinking flexibly may help against the negative effects of stress.
- G3.3: Negative stress can trigger the “fight-flight” response - Who’s at Risk?
- G3.4: Social contact would help protect against oxidative stress.
- G3.5: Negative stress chemicals may cause symptoms like itching, migraines, pain or IBS.
- G3.6: Antihistamines may help if there is a genetic tendency to overproduce histamine.
 - Some background information:
 - What is a nerve signal? “Pain” or “no pain”? Or “on” or “off”?
 - Antihistamines taken daily can be helpful if excess histidine is a problem.
 - G3.6.1.3: Oxidative Stress > metabolic waste products > “TRPA1 sparklets.”
 - G3.6.1.4: “People with overactive TRPA1 channels” may include people with symptoms of:
 - G3.6.1.5: People with overactive TRPA1 channels may be sensitive to:
 - G3.6.1.6: Formaldehyde & Oxidative Stress
 - G3.6.1.6.1: Formaldehyde: Health risks, and Environmental and Dietary Sources.
 - G3.6.1.6.2: Environmental and and Dietary Sources of Formaldehyde include:
 - Formaldehyde might be accumulating from several sources (G.56):

G3.6.1.6.3: Health Risks & Fact Sheets re Formaldehyde, Environmental Safety & Health.

G3.6.1.6.4: Houseplants can help offices as well as astronauts:

G3.6.1.7: TRPV channels - the comfort of vanilla, the heat of capsaicin (hot pepper).

(Excerpts from [Effectivecare.info/Googledocs](https://www.effectivecare.info/Googledocs))

8.1: Early childhood attachment styles can affect trust as an adult.

Our early childhood experiences can affect our later trust in others or even in the products we buy. How secure we felt with early caregivers can leave us more or less trusting as adults.

We learn to feel more or less secure as children, when we are dependent on adults for our food, safety, and emotional support, and it can be difficult to unlearn old patterns and relearn new ones.

A child who learned a more secure attachment style during their youth may as adults be more open to suggestions or to looking at things as mixtures of both good and bad. Accepting life as a mixture can make it easier to appreciate the good aspects and to accept and cope with bad aspects, instead of pretending that everything is perfect and ignoring or denying that there may be room for improvement in a situation or relationship.

8.2: Attachment styles can be modified with therapy, but not easily.

Learning about attachment styles can help individuals with less secure styles to improve their skills in personal and business relationships but changing the core values and habits that were learned in childhood takes time and dedicated practice of the new skills. (8.1) How much we trust in others and or trust in the products we purchase as a customer may be related to how secure we felt with our childhood relationships. (8.2)

Cognitive therapy techniques such as "*Dialectical Behavior Therapy* " (DBT) may be helpful. DBT is a strategy in the field of mental health care that was first developed by Marsha Linehan, Ph.D. in 1993 for working with patients with Borderline Personality Disorder.

- The goals for the therapy are to help individuals gain better understanding and acceptance of their nonverbal and verbal thoughts, motives, and behaviors;

and to develop more effective strategies for coping with strong emotions; and for improving communication with others & with oneself.

It can be difficult to let others know what your concerns are if you aren't able to describe your own feelings.

- 1997: *Dialectical Behavior Therapy (DBT) for Borderline Personality Disorder*. (8.3)
- 2001: *Dialectical Behavior Therapy in a Nutshell*, by Linda Dimeff and Marsha Linehan, PhD. (8.4)
- Workbooks are available based on the DBT techniques which can be used individually or with a trained clinician; one example is: "*The Dialectical Behavior Therapy Skills Workbook: Practical DBT Exercises for Learning Mindfulness, Interpersonal Effectiveness, Emotion Regulation & Distress Tolerance*," by Matthew McKay, Ph.D, Jeffrey C. Wood, Psy. D, and Jeffrey Brantley, MD, (New Harbinger Publications, Inc., 2007, Oakland, CA). (8.5)

Other resources about attachment styles and therapy are listed at the end of this page.

8.3: Types of Attachment Styles:

How the caregivers in a child's life respond to the child's behavior and bids for attention from the caregiver has been observed to lead to three main types of attachment styles between the caregiver and child. Two scientists were involved in the theory's development. The observation of parent/child pairs and description of the attachment styles was by Mary Ainsworth, who based her work on an ethological theory about attachment developed by John Bowlby, a psychoanalyst.

Mary Ainsworth observed pairs of young children, toddler age, and their caregivers in a play situation where the caregiver would temporarily leave the room. The children were then observed to see how fearful they became when they noticed the absence of their caregiver and how they would act upon the return of the caregiver (mothers). The pairs had already been observed during normal play and the children were found to behave consistently based on how the caregivers interacted and responded to the toddler's attempts to gain comfort upon their return. (8.6)

- Children whose caregiver allowed them to explore somewhat freely but who were available for comfort if needed became more trusting as adults and open to experiences. In the research study this attachment style was called *secure*.
- Children whose caregiver reacted fearfully and controlling of the child's attempts to explore rather than giving comfort and encouragement that the situation was

safe for exploration became less likely to explore and were more worried when their caregiver left the room. This attachment style was called *anxious-resistant*.

- Children with this attachment style tend to become less trusting and open to experiences as adults. · Children whose caregivers ignored the child's attempt to gain their attention for comfort would tend to stop trying to attract the caregiver's attention and were more indifferent at their caregiver's absence from the room. This group also tends to become less trusting and open to experiences as adults. This attachment style was called *avoidant*. (8.6)

1. **Secure attachment** typically occurs when the caregiver is available when the child is fearful but who isn't overly protective or controlling when the child is happily playing or exploring.
2. **Anxious attachment** may occur when a main caregiver allows little freedom for the child to explore without being stopped or cautioned in some way.
3. **Avoidant attachment** may occur when a main caregiver doesn't respond to the child's verbal cues or body language - smiles are ignored instead of being returned. (8.6)

8.4: Consistency helps build trust at home or in the workplace.

Emotional security as a child can lead to being more trusting as an adult and emotional security for employees can lead to being more trusting as employees. Are employees allowed some freedom to explore? And if they are met with some setback and look for help do they receive it or do they receive fearful and controlling messages or indifference?

Our childhood experiences can leave us with different expectations of others – are they likely to be comforting; or fearful and controlling; or neglectful and indifferent? These different expectations learned as children can leave the adult expecting that they will receive the same type of treatment from everyone that they had received from their caregivers. What was normal for a child will seem like it is just normal, normal for everyone, even though it may have been a very different home-life and not at all like what a “typical” child might experience or how an adult would be treated later in life.

The reactions the child developed in an unstable or dangerous home may have protected them then but can leave them overly defensive and quick to anger and over-react, or to freeze up and isolate. An inconsistent parenting style was found to be more likely to negatively affect a child than either the overly fearful or overly indifferent style of caregiving.

Children can be quite resilient even in tough situations and even one concerned adult in their life can help show them what normal can be like; the concerned adult could be a teacher or minister or the caring parent of a childhood friend.

8.7 What is normal? What you were used to as a child.

What is normal? What you grew up with will seem normal to you, but later in life, whatever you get used to can seem more and more like it was always the norm the longer you are making it your new normal pattern of behavior.

Our brains tend to develop habit nerve patterns that follow a certain order if the initial action is started. Elevated levels of dopamine may be involved in more extreme examples of behavior patterns being followed rigidly as in *Tourette's Syndrome* and *Obsessive Compulsive Syndrome* and in *grooming behavior*. (8.23)

Grooming behavior as seen in animals may be related to elevated levels of dopamine if it occurs in a human. The behavior pattern of repetitive licking and stroking or scratching has been studied in animals to better understand the brain nerve pathways that may be involved and the dopamine signaling system that seems to be a primary control. Grooming behavior is a characteristic pattern of licking the backs of the paws and is easily observed in some species of animals either in a lab or wild setting.

8.8: Additional Resources regarding Attachment Styles.

- *Cognitive Reframing*, – a list of steps for recognizing and reframing negative thought patterns on the website Ryananswers.com: (8.10)
- *Psychotherapy, John Bowlby*, – a brief video about John Bowlby's theory: (8.11)
- *To Be Resilient, Don't Be Too Virtuous, I want to tell you what I think is missing from most graduation speeches.*, by Adam Grant, (May 12, 2017) – an article about the importance of moderation for success. Virtues are similar to the core values that form during childhood. Resilience, the ability to keep going after a setback, may be supported by having trust in oneself. A secure attachment style develops when the caregiver trusts the child to explore safely and the child trusts the caregiver to be nearby if needed. (8.12)
- *Attachment styles at work: Measurement, collegial relationships, and burnout*, by Michael P. Leiter, Arla Day, and Lisa Price, Burnout Research, Vol. 2, Issue 1, March 2015, pp 25-35, – this research supports the premise that moderation is important for resilience. Workers with an avoidant attachment style were more likely to have burnout and less positive interactions at work and those with an anxious attachment style had more negative issues at work and were likely to be overly invested. (8.13)
- *Attachment Theory; A Guide for Couple Therapy*, by Susan M. Johnson, (2003), – a 21 page discussion of attachment theory and counseling techniques for working with couples. (8.14)

- *Adolescent-parent attachment: Bonds that support healthy development*, Marlene M Moretti, PhD and Maya Peled, MA Paediatr Child Health. 2004. (8.15)

Disclaimer: Opinions are my own and the information is provided for educational purposes within the guidelines of fair use. While I am a Registered Dietitian this information is not intended to provide individual health guidance. Please see a health professional for individual health care purposes.

The Academy of Nutrition and Dietetics has a service for locating a nutrition counselor near you at the website eatright.org: (eatright.org/find-an-expert)

9. Friendliness helps.

9.1: Friendliness helps create trust for staff and customers.

A friendly work environment can help prevent stress and anger in workers and anger can be a precursor for violence. A hostile environment can also affect the trust of customers for the business. (9.1)

When one employee is being mistreated it not only hurts that employee it also creates a less trusting atmosphere for any coworkers or customers who observe the negative treatment. (9.1) If one person is treated like that then why expect that anyone else might be treated better?

9.2: Stress can lead to anger which can lead to violence.

Stress has been associated with negative symptoms and with increased absenteeism: *"In 2011, the American Psychological Association released results from its stress survey. When asked what symptoms the 1,200 participants had experienced in the past month as a result of stress, 42% reported feeling irritable or angry, 39% anxious or nervous, 37% depressed or sad, while 35% lacked motivation."* (9.2)

Anger has been associated with increased violence and anxiety and other negative symptoms: *"such as decreased productivity, increased absenteeism, ineffective work relationships, and a variety of health complaints, including anxiety, stress, depression, high blood pressure, and heart disease (Begley, 1994; Diamond, 1982; Friedman & Roseman, 1974; Gibson & Barsade, 1999; Neuman & Baron, 1997)."* (9.3)

Reducing and managing our own stress level may be the easiest way we all can help reduce the risk of verbal or physical harassment of people of other genders or those who have some other racial or physical difference. A stressed person may answer a question a little too quickly or with a joke and another person who is also stressed may take it personally and respond negatively and that sort of minor bickering can lead to

increased tension and anger building up which may eventually end up as an angry burst lashing out either that day or on some other stressful day in the future.

9.6: Gratitude and friendship boost dopamine, so does shaming.

Shaming others, reminding them of guilt, can cause an increase of dopamine in the brain of the person doing the shaming. However a compassionate exchange with a friend or acquaintance can also boost dopamine, and so can reading new and interesting information. Listening to music and enjoying good food can also. There are many positive ways to boost dopamine besides shaming others, such as being grateful for others' diverse skills and unique backgrounds.

Shaming others may be a natural instinct to promote one's own morality by making it clear one is not in support of the topic or person being shamed, (9.22), or it may derive from a sense of guilt about the situation or person being shamed. (9.23)

Being fair in the first place would leave less to feel guilty about, accepting each other for our differences as well as our similarities might also.

Shaming others, purposely humiliating them, can also be a form of control or intimidation to show power over another person or group of people. Shaming one member of a group can serve to humiliate and control the group. Less equal societies, with a group of wealthy elite at the top, may be more likely to use humiliation as a control tactic. (9.24) Human sacrifice in ancient cultures was found in a recent anthropology study to be more common in societies that also had greater inequality between the rich and poor. (9.25) However, does shaming work as a form of social control to effectively promote changed behavior in the person being shamed?

The answer is no - or at least not effectively and consistently when it comes to alcohol abuse. Research with reality shows focused on alcohol addiction and recovery have found that alcoholism or relapse were still likely to occur even after public shaming. (9.26)

"The results add to a body of literature suggesting that widely used shaming and humiliating methods of treating alcohol and other drug problems — such as those seen on shows like Celebrity Rehab — are not only ineffective but also may be counterproductive." (9.26)

"Guilt" is a noun referring to the feeling one feels oneself over an error or misdeed, while "shame" can be used as a noun it is more typically used as a verb, "to shame." Others shame the one who is guilty or believed to be guilty of something the group disapproves of. Other studies with alcohol counseling individually also found that shaming tactics did not effectively help individuals stop abusing alcohol. (9.26)

Studies of serial killers and other types of violent offenders found an association with early childhood abuse. Rejection by a parent or other important person in their life

was found to have occurred in the early lives of 48% of a group of 62 serial killers in the study. Other types of physical, sexual or emotional abuse such as humiliation have also been associated with violent offenders, and early adoptions, neglect, or abandonment in early childhood have been associated with violent crime. (9.27)

In a study that included over 1000 violent offenders, shame and humiliation were found to be a common factor; violence was an attempt to restore a sense of pride or self-worth: *“In the work, “Shame, Guilt, and Violence,” qualitative data from over 1,000 institutionalized offenders were gathered and analyzed over the course of four decades. According to Gilligan, self-conscious feelings of shame and a deteriorated sense of self-worth are the causal factors underlying violence; humiliation, Gilligan argues, compromises one’s identity, i.e. the way one sees oneself, and leads to feelings conceptualized as a loss of cohesion of the self, or a conceptual death of the self. This leads one to become violent in order to restore pride, or a sense of self-worth (Gilligan, 2003).”* Overcrowding and economic job stress, which leads to lack of parental time, are factors thought to be involved in the number of young men in gangs who may join them seeking the nurturing that was missing at an empty childhood home. (9.28)

If someone at work has a favorite stapler, maybe just let them enjoy it in peace instead of teasing them about it - and maybe get one of your own to find out what the appeal might be. The topic of shame and shaming is continued in the next section, and a therapy method for individuals who suffer from excessive guilt and a tendency to self-shame (9.29) is discussed in more detail.

9.7: Food, fun, art, music and laughter - all pleasant ways to increase dopamine.

Food and water can help prevent violence by helping promote a good mood. Images of nature or relaxing abstract art images have also been found helpful to reduce stress which was found to help reduce anger by helping reduce stress levels. (9.3)

Dopamine levels may also be increased by pleasant experiences or remembering something you had once enjoyed. Our primitive ancestors likely knew this information without needing the word “*dopamine*.”

9.7.1: Social control through shaming has been found to be ineffective.

The list of cultural similarities from around the world by anthropologist Donald Brown includes several items that might lead to an increase in dopamine levels: *“the existence of and concern with aesthetics, magic, males and females seen as having different natures, baby talk, gods,” “induction of altered states, marriage, body adornment,” “kinship terms,” “numbers, cooking,” “names, dance, play, distinctions between right and wrong,” “empathy, reciprocity, rituals, concepts of fairness,” “music, color terms,” “binary*

sex terms,” “language, humor,” “symbolism, the linguistic concept of “and,” tools,” and “trade.” (pp 271-272, 7.3)

The list also includes more negative behaviors that might also cause an increase in dopamine levels: *“nepotism,” “gossip,” “in-group favoritism.”* (pp 271-272, 7.3) and *“collectively subjecting miscreants to criticism, shaming and mockery, ostracizing and shunning,”* (p325, 7.3)

Is nature rewarding cruelty? Or is nature rewarding behavior that may somehow be supporting the survival of the group as a whole? Civilized people use words to share concerns and develop solutions. Understanding our instincts can help us to recognize when they may be interfering with teamwork and start reacting with logic instead of letting emotion take over your self control. A blogger makes a strong argument against using shame as a tactic for social control in our modern society. (9.26) Whether an individual is a member of an *“individualistic”* or *“collectivist”* society (pp 273-282, 7.3) may also affect how shame is used for social control, protecting the family name is more of a priority in a collectivist culture. (9.30)

For those with difficulty with self acceptance and who have a problem overcoming feelings of guilt and a tendency to self-shame a cognitive therapy technique focusing on compassion has been developed and is described for use in a group setting in the article, *Compassionate Mind Training for People with High Shame and Self-Criticism: Overview and Pilot Study of a Group Therapy.* (9.29)

9.7.2: We may work best when groups have fewer than 150 people.

We are so very connected compared to our ancestors of even just fifty to a hundred years ago. Research in the area of effective business design found that people form better teams when a business *“unit,”* such as one factory in an organization with many facilities, included no more than 150 employees in total. Our brains seem to reach an overload at some point with different types of memory and what we are able to cope with comfortably without stress. Read more: *Startups be warned: Something weird happens to companies when they hit 150 people.* (9.31)

9.7.3: Emotional connections increase oxytocin and positive mood.

More information on the topic of cultural similarities found in our history was included in the section *When to Report?*, and the topic will be continued in more detail again in the section *What is Sexism?*, but next is more information on the topic of good food for a good mood.

G3.2: Thinking flexibly may help against the negative effects of stress.

Chronic stress can damage the health of brain cells. Routines may help save energy for the brain but may also make it more difficult to change habits once the routine has been established. *Neuroplasticity* refers to the connections and pathways that form between brain cells. Long term habits develop as routine nerve pathways between brain cells where an initial action may stimulate the rest of the routine habit. Having routines embedded in our memories may help to save us time when we're performing routine activities like household chores or driving home from work but it may interfere when trying to replace an old habit with a new habit. Routines may save energy for the mind to wander to other thoughts while the familiar chore is being performed.

The ability to form new pathways in the brain may also help to reduce the negative effects of stress. (G3.1) Games that are designed to boost brain plasticity may simply be boosting our ability to take tests.

When habits become an automatic part of life they can save energy by reducing the need to make minor decisions. Every decision or use of willpower that we perform throughout the day can deplete our mental energy and reduce our ability to resist making impulsive decisions. Isaiah Hankel describes a way to make habits that last by making smaller changes and attaching them to a routine that already exists. If you always brush your teeth each morning and want to be better about taking a vitamin supplement or medication every day attach the new habit to the old one by linking them consistently. Older research suggested it can take three weeks of consistency to build a new habit while more recent research suggests it may take closer to two months. For more information see *Chapter 8: Automaticity, Scaling, and the Rise of Mental Loops*, in the book by Isaiah Hankel, Ph.D. called *The Science of Intelligent Achievement*, (pp 52-58, G3.123).

More research is needed to better understand neuroplasticity and how we can change old habits by changing the old neural pathways. (G3.2) In the meantime learning new words has been found to stimulate reward pathways in the brain. And it was found that people with stronger connections between the two regions of the brain involved in the reward pathways were able to learn more words than people with weaker connections. (G3.3) Poetry may activate the brain similarly to music by helping increase brain connectivity in a similar way to what occurs when someone is listening to or composing music. (G2.1)

Meditation & Mindfulness Training can help an over anxious brain.

Mindfulness Training can help increase awareness of the issues that may be exciting or infuriating, but at a wordless subconscious level so they may go unnoticed and lead to behaviors that don't seem to have a obvious reason or cause: *How Mindfulness Helped a Workplace Diversity Exercise*: (12.22)

And other research suggests that meditation and having a sense of purpose in life may help reduce some of the negative effects of stress which include cellular changes associated with aging. (G3.4)

Communication or Assertiveness Training may help reduce stress by improving effectiveness of conversation and by increasing the likelihood of having pleasant exchanges rather than difficult ones.

Communication difficulties can lead to direct stress effects on the body that occur during the conversation, lack of oxygen itself from tensely holding the breath, talking too fast or crying, might also add to negative effects of oxidative stress. Stress might also occur over time from the resulting lack of progress on the topic that was being discussed with difficulty instead of with clear exchange of each person's priorities, concerns, and goals.

Issues from our childhood with communication problems we observed in our parent's or other caregiver's conversation may show up in our own behaviors. Role playing in a group may help reveal where other people's typical responses are different than what you might have responded yourself. Role playing can help provide a safe place to practice new communication techniques with people who understand the technique and that it is practice. The strategy is used in Family Therapy but power struggles can be part of many types of relationships not just within families.

Training materials about equality within a conversation or within a relationship were developed for helping victims of domestic violence and batterers learn how to recognize problem behaviors within their communication and actions. The handouts may be helpful for most age groups as emotional manipulation or abuse of power and control can occur in many types of relationships not just between couples. Discussing the difference between equal exchanges in a conversation and unequal ones in a calm neutral setting may be helpful to prevent a difficult exchange from ever happening in the first place.

- ***Power and Control and Equality Wheels:*** The *Power and Control Wheel* (I.21) was developed by the **Domestic Abuse Intervention Programs** (DAIP). (I.22) Manipulative behaviors are grouped into eight categories in the model. An additional *Equality Wheel* (I.23) was developed to help guide batterers and victims of emotional or physical abuse towards healthier ways to interact. It is grouped into eight equivalent categories with examples of healthier ways to interact with each other. Problems frequently can involve communication issues by both people in a relationship.

Crisis Hotlines and Resources:

- **U.S. National Suicide Prevention Hotline:** Call 1-800-273-8255, Available 24 hours everyday. (I.16.[suicidepreventionlifeline.org](https://www.suicidepreventionlifeline.org))
- **National Helpline: Substance Abuse and Mental Health Services Administration:** "SAMHSA's National Helpline, 1-800-662-HELP (4357), (also

known as the Treatment Referral Routing Service), is a free, confidential, 24/7, 365-day-a-year treatment referral and information service (in English and Spanish) for individuals and families facing mental and/or substance use disorders." (I.17.samhsa.org)

- **Rape, Abuse and Incest National Network, RAINN Hotline:** 1-800-656-HOPE, (I.18.RAINN.org)
- **National Domestic Violence Hotline:** 24/7 confidential support at 1-800-799-7233 or TTY 1-800-787-3224. (I.19.thehotline.org)
- **Child Welfare Information Gateway:** a variety of toll-free hotline numbers for concerns involving the safety of children. (I.20)

G3.3: Negative stress can trigger the "fight-flight" response - Who's at Risk?

Stressful times can make fear and anxiety more likely as our body's instincts expect to either run from danger or to freeze in position, possibly in the hopes of not being noticed by a predator.

Who's more at risk to experience stress with a negative fear response?

Who is more at risk to experience a challenge with a negative fight, flight, or freeze stress response? (G3.10) Instead of having their body or mind perceive a stressor as a positive challenge and an exciting reason to get up each morning ready to say "*Carpe diem*"?

Who is more at risk to experience stress as a negative stress response instead of seeing it as a positive challenge and reason to get up and get busy?

- Answer: many groups are more at risk for having their bodies respond to an event with more of a negative stress response than the average person.

People more vulnerable to the negative health effects of stress include:

- older adults;
- mothers and especially working mothers;
- less educated individuals;
- divorced or widowed individuals;
- people with financial concerns or lack of health insurance;
- isolated or lonely people;
- people who are targets of racial or sexual discrimination;
- people who live in cities,
- and people with a history of childhood trauma can be more risk to feeling stress.

- Summarized from "*Stress*": (G3.5), University of Maryland Medical Center.

G3.4: Social contact would help protect against oxidative stress.

People and other species are social creatures whose survival may have been dependent on being part of a group rather than being isolated. Loneliness has been associated with increased inflammation and a reduced resistance to infection by viral diseases. Genetic changes have been found to occur in isolated individuals that lead to the increased inflammatory response in comparison to individuals who have more social support. Genes can be temporarily turned on or off depending on the environment.

Our instincts have developed to trust that being part of a group increases our chance of survival. Having a role that fulfills a valued purpose for the group is associated with an increased sense of happiness. Read more: *A Better Kind of Happiness*, by Will Storr, (G3.9).

Fitting into groups well can require social skills that need to be nurtured from birth. Infants learn body language at an early age by interacting with a parent who responds to the baby's cues. If the baby smiles the mother smiles back and the baby learns to smile more readily. If the baby has a mother that doesn't notice body language though, then the infant may stop smiling as often.

Infants and children depend on their caregivers for everything and try to please with their smiles, eye contact, or baby coos. If the infant isn't receiving eye contact in return however they may stop trying or are scolded they may learn to look away and to avoid eye contact.

Children ideally need emotional support in order to develop trust in themselves and in others. Parents who have limited skills in understanding and accepting their own emotions may not be able to teach their children what they don't understand themselves. Children who have some role model in their lives who understands emotional skills may cope better than children who don't.

The topic is discussed in more detail in the book *Adult Children of Emotionally Immature Parents: How to Heal from Distant, Rejecting, or Self-Involved Parents*, by Lindsay C. Gibson, PsyD, (New Harbinger Pub., Inc., 2015, Oakland, CA) (G3.10) (This book is not a twelve step book and is not affiliated with the *Adult Children of Alcoholic or Dysfunctional Parents* twelve step group.) On page eight the author discusses the importance of emotional connection for humans and other mammals for responding less negatively to stress. Stephen Porges published work in 2011 suggesting that mammals evolved a way in which we can get additional soothing during fear situations when we are in touch physically or possibly even mentally - thinking about them during times of need. It involves vagus nerve pathways that can be inhibited to reduce the fight, flight, or freeze stress reaction. (G3.10)

So a sense of connection to others can help reduce the negative inflammatory effects of the stress response. Some stress can be healthy to help get us moving to

meet whatever challenge has occurred. Stress may become more overwhelming however if the person is isolated or never learned social skills or developed enough trust in others to ask for help or seek out help.

Children in situations with emotionally immature caregivers may learn that people around them can't be trusted or that trying doesn't lead to success so why bother trying - they can learn a sense of helplessness and hopelessness and not even try to seek help because they are unfamiliar with finding strength or support from others.

In the book *Adult Children of Emotionally Immature Parents: How to Heal from Distant, Rejecting, or Self-Involved Parents*, by Lindsay C. Gibson (G3.10) four different types of emotionally immature caregivers are described and how growing up with them might affect children. Solutions are also provided in the form of techniques for how, as an adult, a person might overcome the lessons they learned as a child once they discover that emotions aren't dangerous things to never be discussed or worse - that one might be punished for exhibiting them.

Some emotionally immature people may feel threatened by strong emotions and may react negatively to children who are simply being children. The child in that situation learns to not trust themselves and may not learn that emotions are normal rather than upsetting or frightening.

Severe childhood trauma can lead to changes in the brain that cause ongoing symptoms of *Post Traumatic Stress Disorder (PTSD)*. A new strategy for treating PTSD has been developed which involves electrical stimulation of the vagus nerve called *Vagal Nerve Stimulation (VNS)*.

The excerpt summary from the book *Adult Children of Emotionally Immature Parents* (G3.10) regarding the research by Stephen Porges suggests that the vagal nerve is the nerve pathway that naturally is stimulated when social contact is sought by mammals who are enduring a stressful situation. (G3.11) (G3.12)

Whether you are a parent or a teen or an adult learning more about emotional maturity and immaturity can help understand your own emotions and others. Whatever we grow up with will seem normal to us and as adults we tend to seek out similar relationships to those we were familiar with as children - but sometimes what seems normal to some people isn't normal for everyone else and there is no need to continue living in abusive situations just because it seemed like a normal part of life as a child.

Lack of emotional skills may increase the risk of acting inappropriately when under severe stress. People need the support of people to help reduce negative effects of stress and increase a sense of connection and purpose. People need to learn emotional skills from people who have emotional skills - or sometimes from a book, *Adult Children of Emotionally Immature Parents: How to Heal from Distant, Rejecting, or Self-Involved Parents*, by Lindsay C. Gibson: (G3.10)

- *Attachment Theory* and parenting styles are discussed in section 8. *Trust is learned early.*

The descriptions in this section suggest the inconsistent parenting of the *Disorganized* style or a parent that switches between *Avoidant* and *Anxious-Resistant* styles. A more trusting *Secure* style can be achieved with the help of *Cognitive Therapy* techniques and practice; but it is a lot of work to change core values, or more realistically - attempt to modify slightly, core values that remain from early childhood. *Art Therapy* or *EMDR* therapy can help access nonverbal feelings and events that may have occurred during the preverbal years of childhood. *Dialectical Behavior Therapy* can help when there are cognitive and physical issues underlying mood symptoms.

G3.5: Negative stress chemicals may cause symptoms like itching, migraines, pain or IBS.

Our bodies don't have specific receptors just for sensing "*pain*." Pain is a sign that something is wrong in the body and is sensed in a variety of ways. In medical terminology there are two main types of "*pain*."

- **Nociceptive pain** is associated with physical damage to the body or by sensations of pressure or heat or extreme cold. It might be due to pressure from a cancer tumor. Nociceptive pain might be described as "*sharp, aching or throbbing*."
- **Neuropathic pain** is caused by physical damage or pressure on nerves. It might also be due to a cancer tumor but one that is pressing on a nerve. Nerve damage can also be due to some nutrient deficiencies such as vitamin B12, (G3.13), or other "*Nutritional imbalance, alcoholism, toxins, infections or auto-immunity*." Neuropathic pain often is described as "*a burning or heavy sensation, or numbness along the path of the affected nerve*." (G3.14)

Some types of pain such as migraine headaches may involve both nociceptive pain due to the pressure of inflammation or dilation of blood vessels and neuropathic pain from pressure on nerves by dilated or inflamed blood vessels.

The next part gets complicated, some background information:

- *Calcitonin* is a hormone released by the thyroid that promotes lower blood calcium levels by reducing bone resorption, (G3.15) (*Bone resorption*: breakdown of the bone and release of minerals, (G3.16)).
- *Calcitonin Gene-Related Peptide 1 and 2 (CGRP 1: (G3.17) and CGRP 2: (G3.18))* cause dilation of blood vessels in the heart and brain and throughout the body. Its prevalence in the Central Nervous System (CNS) also suggests that it may also have a neurotransmitter or neuromodulator role.

CGRP is produced by nerve cells in the brain and throughout the body. The protein has a role in sensations of pain. It is a member of the calcitonin family of proteins and exerts its effects at receptors that are formed from two other types of receptors.

The CGRP protein has two commonly found forms, one helps reduce pain and one helps increase it - luck of the draw. The alpha form of the protein may help reduce pain while the beta form is associated with migraine, temporomandibular joint (TMJ) pain, psoriasis and irritable bowel syndrome (IBS). The beta form is largely produced in keratinocytes found in the epidermis layer of skin. The alpha form is the type produced more within sensory nerves. (G3.19) (Psoriasis is an eczema-like condition believed to be autoimmune in nature.)

After a physical injury like a bump on the shin, inflammation causes an increased output of the *Calcitonin Gene-Related Peptide (CGRP)* and an inflammatory protein that is called *Substance P*, possibly for *peptide*, which is another word for protein. The release of the peptides follows shortly after an inflammatory event and shortly the chemicals are released there is edema and plasma leakage in the surrounding area. (G3.20) The inflammatory peptides are also released in increased amounts during migraine headaches. (G3.21) The peptides increase the dilation of blood vessels and cause increased leakage from blood vessels (edema) and “degranulation of mast cells.” (G3.19) (G3.21)

Levels of CGRP increase in people who suffer from migraines and a type of prescription medication, called sumatriptan, which has been found helpful to stop migraine pain, has also been found to inhibit the release of CGRP in migraine patients. The medication may be inhibiting the release of CGRP by increasing intracellular levels of calcium. The “*cytokine TNF- α* ” may be involved in migraine pain. (G3.21)

That was the background - the bottom line - magnesium deficiency can make the body more susceptible to the negative effects of CGRP, Substance P and chronic stress. And a chronic stress situation combined with chronic magnesium deficiency may lead to the development of inflammatory conditions like migraines, fibromyalgia, PTSD, or Irritable Bowel Syndrome. The magnesium deficiency associated with the inflammatory peptides CRGP and Substance P may be causing an increase in the level of the cytokine TNF as early as two days after a deficient diet was begun in a research study with lab animals. (G3.22)

So an Epsom salt bath or foot soak may relieve itch by providing the body with a form of magnesium that can be absorbed through the skin bypassing any GI problems that might underlie a chronic magnesium deficiency. It isn't uncommon to have a diet low in magnesium but it is also not uncommon in the food supply. Problems with poor absorption or increased kidney or bowel loss are common causes of chronic magnesium deficiency.

A variety of tips for reducing Substance P levels are included in the article *Trichodynia, Pain, and Substance P*. Exercise, hobbies that use repetitive motions of the hands, and stretching exercises may help reduce excess levels of the inflammatory chemical according to the article on the website drwardbond.com, see the article for more details: (G3.23)

G3.6: Antihistamines may help if there is a genetic tendency to overproduce histamine.

Genetic differences in more than 70 genes have been associated with increased itchiness, see summary at the end of this section. (G3.24) Calcium and serotonin levels may be involved in increased itch or arthritis pain signals being sent or perceived. (G3.25) Scratching an itch is considered rude and a chronic itch is often considered funny however it isn't fun.

Some background information:

Too much or too little calcium and magnesium can affect pain, itching, and mood. The minerals are both electrically active, and provide energy for ion channels which control the transport of messenger chemicals like serotonin across cell membranes - such as nerve cell membranes which might feel like a sensation of itchiness or pain.

Excess serotonin may be involved, (G3.26, G3.27), and scratching an itch can make the urge to scratch more intense, even worse afterwards, even though there may be a temporary feeling of relief while scratching. (G3.28) Adequate magnesium is essential for reducing pain in arthritis or at least may help reduce pain levels. (G3.27) An antihistamine may help for some types of itching related to genetic conditions. (G3.29)

Excess dopamine levels can also be a cause of an overwhelming urge to scratch - see "*grooming behavior*" in section 7. *When to Report?*. The solution there is to figure out why dopamine levels are that elevated. Elevated dopamine can be a symptom of hyperthyroidism but it can also be associated with other conditions.

- ***An Itch You Just Can't Scratch; NIH-funded study identifies proteins that may cause chronic itch.*** Summary points: The HTR7 gene was found most closely associated with chronic itch in an animal based study, however over 70 genes were found to be more expressed, more active in lab animals with chronic itch. The gene expression of the HTR7 gene was most active in the mice with the worst symptoms of scratching compared to the mice with the least sensitivity. The activity of the TRP1 receptor was also increased in animals with more symptoms. (G.24)
- ***Transient receptor potential ankyrin 1 (TRPA1) receptor is involved in chronic arthritis: in vivo study using TRPA1-deficient mice.*** Summary points: The TRPA1 receptor is directly activated by calcium levels inside of the cell, and

a variety of toxins or “*noxious*” (irritating) substances that are produced as a normal part of “**oxidative stress**” otherwise known as “*inflammation*” including, “**4-hydroxy-2-nonenal**, **hydrogen peroxide**, *hypochloride*, *hydrogen sulphide*, *15-delta prostaglandin J2* [25–28].” and irritants from the environment or diet can also activate the TRPA1 receptor, *1.“**mustard oil** (*allyl isothiocyanate*: AITC) [29], *2. **cinnamaldehyde** [30, 31], *3. **allicin** [32, 33] and *4. **formalin** [34]...”. (G3.25) Serotonin and other “*Inflammatory mediators, such as bradykinin...*[19, 35]” (G3.25) can make the receptors more sensitive which can lead to increased responsiveness of nerve endings - more pain (G3.25) or itch. (G3.24) *See the next section for more information about the chemicals in bold font and where they may be found in the diet or environment.

***People with overactive TRPA1 channels may be sensitive to:**

1. **Mustard:** “*mustard oil*”
2. **Cinnamon:** “*cinnamaldehyde*” (G3.43));
3. **Onion or Garlic:** “*allicin*,” (G3.41)
4. **Formaldehyde:** “*formalin*,” chemically the two are very similar: (G3.42) and formaldehyde is found in the environmental and as a metabolite of some alternative sweeteners and other dietary sources. (G3.56) Environmental sources include which would include first and second hand smoke, poorly ventilated air or smog, especially when there is brand new flooring or other new plastic or vinyl material in the living area, it can release volatile chemicals including formaldehyde at levels that can make a sensitive person feel ill. Metabolites of the breakdown of the alternative sweetener aspartame and Neotame include menthol and formaldehyde. (G3.44) Older packages of fruit juice also may contain increasing amounts of formaldehyde as the product ages, more of the chemical is produced from other chemicals.

Magnesium, Opioids, and Neuropathic Pain.

This list and this section got much longer actually, and eventually led me back to a topic I've written about in 2011, and which is one of the underlying causes of overactive TRP channels. Fortunately it also has a simple solution, (G3.101), unfortunately - it is so simple a solution that it isn't profitable - unfortunately for individual patient's health and quality of life and unfortunately for the economic health of individuals and nations and businesses who are being overcharged by the medical industry for healthcare that isn't always effective and sometimes causes harm.

It is so effective a solution for improving mood and pain and muscle cramp type symptoms that I've been sharing the information online since at least 2011 and the article I shared was research from 2009, (G3.101), - so the clock is ticking on how soon the *evidence based medical research* will reach the individual patient who is in pain. The racers at the starting line are the physicians and nurse practitioners and other

health professionals who make recommendations for opioid medications in an attempt to block pain instead of trying to find and resolve the cause of the pain.

What is a nerve signal? "*Pain*" or "*no pain*"? or "*on*" and "*off*"?

Pain, however, should not just be blocked without trying to understand the cause. It is a message from the body desperately asking for help but it is not always a clear message. Pain in one area of the body may have to do with an issue in another area of the body. Instead of blocking the pain signals we need to listen to them more carefully and try to figure out what the pain signals mean and how to resolve the underlying cause of the pain. Something might be missing and need to be added back into the diet or something might be happening in excess either in the diet or lifestyle habits and need to be stopped or moderated.

Nerve signals are not specific to send the brain a message of "*pain*" that exclusively means "*pain*;" a nerve signal is more of an "*on*" or "*off*" and might indicate a variety of extremes: too hot or too cold, or too rough or too light (ticklish), or too *hot peppery*, (*capsaicin*, (G3.100), more on that later), or too *mustard oily*. The nerve signal is simply telling the brain that "*something*" happened - figure it out captain of the ship - and fix it - such as remembering to wear gardening gloves before handling wild mustard weeds, especially if you have *diabetic hypersensitivity*.

The TRP channels are the bridge between the world and the nerve signal. There are many types and they can respond to specific temperatures, so some might activate when it is very cold and some might activate when it is very hot. Some might react to the hot pepper and some might react to the mustard oil. They would all tell the same nerve - "*something*" extreme happened.

Mustard oil can cause an extremely itchy reaction. It is used to induce "*hypersensitivity*" in lab animals to study the condition in relation to *diabetic hypersensitivity*. This will be discussed in the next section in more detail. (G3.96) Wearing gloves may be advisable when pulling a patch of wild mustard if you tend to have sensitive skin or allergic reactions. (p124, G3.97)

Antihistamines taken daily can be helpful if excess histidine is a problem.

Antihistamines taken as a daily precaution may be helpful for people with overly sensitive skin if the sensitivity is related to a tendency to overproduce histidine. (G3.29) If that is an issue, then taking an antihistamine medication daily may also help for some types of chronic pain as well, more will be included in the next section. Acupuncture is a traditional therapy that may help reduce the overactivity of TRPV channels and reduce the production of the inflammatory peptide Substance P and other cytokines. Acupuncture can affect both the opioid and the cannabinoid receptors - but without needing the prescription or having to experience the side effects! (G3.104)

G3.6.1.3: Oxidative Stress > metabolic waste products > "TRPA1 sparklets."

To return to the excerpt and list from the previous section, the first list of chemicals known to activate TRPA1 channels included waste products of metabolism. Metabolism is the chemical deconstruction of a larger molecule into smaller parts. Enzymes are necessary that are specific to the exact type of chemical transformation. Toxins can collect without enough of the right type of enzyme to metabolize them into smaller chemicals that are safe or can be excreted more easily by the kidneys.

- The summary and excerpt: The TRPA1 receptor is directly activated by **calcium** levels inside of the cell, and a variety of toxins or "*noxious*" (irritating) substances that are produced as a normal part of "**oxidative stress**" otherwise known as "*inflammation*" including, "**4-hydroxy-2-nonenal**, **hydrogen peroxide**, *hypochloride*, *hydrogen sulphide*, *15-delta prostaglandin J2* [25–28]." and irritants from the environment or diet can also activate the TRPA1 receptor, *1. "**mustard oil** (*allyl isothiocyanate*: AITC) [29], *2. **cinnamaldehyde** [30, 31], *3. **allicin** [32, 33] and *4. **formalin** [34]..." (G.25) Serotonin and other "*Inflammatory mediators, such as bradykinin...*[19, 35]" (G.25) can make the receptors more sensitive which can lead to increased responsiveness of nerve endings - more pain (G.25) or itch. (G.24)
- And a new excerpt about oxidative stress and metabolites that are produced within the body, some would activate TRPA1 channels: "*Reactive oxygen species (ROS)*"(G.93) formed from **oxidative stress** were found to activate the TRPA1 channels in the cerebral arteries but not in other areas of the vascular system, "*NOX-induced activation of TRPA1 sparklets and vasodilation required generation of **hydrogen peroxide** and lipid-peroxidizing hydroxyl radicals as intermediates. **4-Hydroxy-nonenal**, a metabolite of lipid peroxidation, also increased TRPA1 sparklet frequency and dilated cerebral arteries.*" (G.93).

"*Increased TRPA1 sparklet frequency*" (G.93) can be caused by chemicals that are produced during oxidative stress - which can be caused by emotional or physical reasons. The significance is that it means more calcium or other chemicals could be rushing through the open channel in the membrane wall. Calcium can also be an activating substance as was mentioned in the first summary and excerpt. This is complex chemistry and is just meant to be an introduction to the topic of *oxidative stress* in relation to conditions of chronic pain and itch. That second excerpt is from an additional list and is about chronic migraine - who are the people who might be more likely to have overactive TRPA1 channels? - quite a few besides those with sensitive skin or pain problems. A more complete list is in the next section but it is likely an incomplete list.

G3.6.1.4: “People with overactive TRPA1 channels” may include people with symptoms of:

- “chronic itch” (G3.24);
- “chronic arthritis” (G3.25);
- “inflammatory bowel diseases (IBD: ulcerative colitis, Crohn’s disease)” (G3.76);
- people with an Irritable Bowel Syndrome (IBS) may also have had a history of child trauma, domestic violence or sexual abuse: “As Leserman and Drossman (2007) note, patients with a history of physical or sexual abuse in childhood, or intimate partner violence, have 1.5 to 2 times the risk of reporting gastrointestinal symptoms or having a functional gastrointestinal disorder.” (G3.94); and trauma survivors may also have comorbid chronic pain conditions such as fibromyalgia: “Van Houdenhove et al. (in press) found that 64% of patients in a group for FMS or Chronic Fatigue Syndrome had at least one type of either child or adult trauma. More concerning was that 39% of the group reported abuse during childhood and as adults, indicating a lifelong pattern of abuse. Although these findings are somewhat mixed,” (G3.94);
- a medical hypothesis suggests TRPA1 channels may be involved in many chronic pain and airway conditions and also diabetes: “Furthermore, TRPA1 is also involved in persistent to chronic painful states such as inflammation, neuropathic pain, diabetes, fibromyalgia, bronchitis and emphysema.” (G3.95);
- symptoms of “diabetic hypersensitivity” (G3.96) might feel or sound like: “Don’t touch me it hurts.” Symptoms of mechanical hypersensitivity may feel like being physically over sensitive to any sensation. Any touch may be experienced as “pain” or “itch” instead of being pleasant. Symptoms of hypersensitivity associated with diabetes have been found to respond to TRPA1 channel antagonists - chemical inhibitors - a medicine in other words. (G3.96) Reducing the over activity of the TRPA1 channels would help resolve the underlying problem but overmedicating would be a risk. Too much inhibition, too much of the medication could be dangerous to long-term health as the TRPA1 channels play important functions throughout the body.;
- “chronic migraine,” “cluster headache,” (G3.77); “Reactive oxygen species (ROS)” (G3.93) formed from **oxidative stress** were found to activate the TRPA1 channels in the cerebral arteries but not in other areas of the vascular system, “NOX-induced activation of TRPA1 sparklets and vasodilation required generation of **hydrogen peroxide** and lipid-peroxidizing hydroxyl radicals as intermediates. **4-Hydroxy-nonenal**, a metabolite of lipid peroxidation, also increased TRPA1 sparklet frequency and dilated cerebral arteries.” (G3.93);
- **preeclampsia** may involve overactivity of the TRPA1 channel, it also has mechanico-sensitive properties or other TRP channels - more research is needed: (G3.78, G3.79, G3.80, G3.81, G3.82, G3.83);

- chronic respiratory conditions involving “**airway inflammation**” such as “**asthma**” or “**COPD**,” overly dry airways may be a problem causing difficulty with completely emptying the lungs. (G3.84);
- **cardiac issues such as Congestive Heart Failure** may involve TRPC channels, (G3.85), which are not activated by the food type items on the list below but which are likely to be activated by cannabinoids which are #8 on the list below, (G3.89, G3.90);
- **male infertility due to motility issues in the sperm**, (G3.87, G3.88). TRPC channels (G3.89) can be activated by *Phospholipase C* (G3.90) which suggests they can be activated by other phospholipids as well. So a deficiency or gene difference affecting their production endogenously may be involved in male infertility involving motility. More research is needed. In the meantime formaldehyde is definitely not beneficial for fertility in women or men. There is more research available regarding exposure risks for female reproductive health (G3.91) than for males.(G3.92)

G3.6.1.5: People with overactive TRPA1 channels may be sensitive to:

And now we return to the list from the section on the last page. It is greatly expanded now with more food items and other possible substances that can activate TRPA1 channels and TRPC channels, gathered from the research about the list of conditions that might be at increased risk for overactive TRP channels. The TRP channels are all membrane channels but there are many individual types and several categories. The basic form and function is similar however and is described and illustrated in an article about the TRPC channel and cardiomyopathy associated with Congestive Heart Failure, which was included in the previous list. (G3.85)

1. **Mustard:** “*mustard oil*”, (G3.25); “*Isothiocyante derivatives constitute the main pungent ingredients in wasabi (allyl isothiocyanate), yellow mustard (benzyl isothiocyanate), Brussels sprouts (phenylethyl isothiocyanate), nasturtium seeds (isopropyl isothiocyanate) and capers (methyl isothiocyanate). Allyl isothiocyanate is the major active ingredient in mustard oil.*” (G3.67); Yellow mustard is the condiment used in many ways in cooking. It is a spice made from a small seed that is dried and powdered. It has medicinal value for a variety of conditions. Mustard oil applied topically as a massage oil is reported to provide relief for pain due to arthritis. (G3.68) Wasabi is a type of horseradish like seasoning used in Japanese cooking. It is a root vegetable that also has many medicinal benefits. (G3.72) Brussel sprouts are a vegetable that look like tiny cabbages and are botanically related to cabbage. They are very healthy in many ways and might be worth trying in smaller quantities, steamed more thoroughly rather than raw or lightly steamed or sauteed.(G3.71) Nasturtium seeds can be

pickled and used in cooking similarly to capers. (G3.69) Capers are a pickled product with a peppery taste which resemble peppercorns, however they are made of the springtime buds of the caper plant which are picked when they are the size of peppercorns, and are preserved in a pickling brine. Capers are used in salads or savory dishes. (G3.70)

2. **Cinnamon:** "*cinnamaldehyde*", (G3.25); Cinnamon is a spice used in cooking which is made from the inner layer of bark from a plant. It is dried and powdered and used in baking or savory dishes. Medicinally a ½ teaspoon of cinnamon per day has been found helpful for improving blood sugar control. A half teaspoon is a large amount for a single serving but some people enjoy it at breakfast stirred into a bowl of hot cereal. (G3.43, G3.67))
3. **Onion or Garlic:** "*allicin*", (G3.25); (G3.41) To be more precise - the raw garlic contains allicin; baked or roasted garlic would be less likely to still have allicin present. It would likely be similar for onion, raw or lightly sauteed might be a problem while caramelized, baked, or roasted might be tolerable. (G3.67)
4. **Formaldehyde:** "*formalin*", (G3.25); chemically the two are very similar: (G3.42); and formaldehyde is found in the environment and as a metabolite of some alternative sweeteners and other dietary sources. (G3.56) See the next section for more information on sources and ways to avoid *Formaldehyde*.
5. **“(Winter-green),”** (G3.67); Wintergreen is a natural flavoring herb in the mint family. It is typically used as an essential oil as a flavoring in many foods and other types of products. It has medicinal benefits related to it containing the chemical that acts as the pain killing ingredient of aspirin.(G3.73)
6. **“eugenol (Cloves)”** (G3.67); Cloves are used in a traditional holiday decoration to make an aromatic dried ornament from an orange. The tack like cloves are poked into the rind of a fresh orange and then the fruit is allowed to dry and it shrinks and smells good for a long time without spoiling if it was allowed to dry thoroughly. Cloves for use in cooking or baking are ground into a powder and used in baking and also in savory dishes and chutneys. The spice and essential oil also have medicinal benefits. The essential oil has numbing properties and in traditional medicine is applied topically to the gums for relieving the pain of a toothache.(G3.74)
7. **“and gingerol (Ginger).”** (G3.67); - a root with medicinal properties and commonly used in cooking as a minced or chopped vegetable and is used in dried and powdered form as a spice in savory and baked dishes and may be served dried and candied and used as a candy or chopped and used in baked goods or chutneys. Ginger has many medicinal benefits and has been found helpful for the relief of arthritis pain when used in a quantity that would be equal to about a half teaspoon of the dried powder. Pregnant women should avoid

large quantities of the herb or vegetable or candy as miscarriage may be a risk. (G3.75)

8. “ Δ 9-tetrahydro-cannabinol (**THC**) and **cannabinol** (an oxidation product of THC).” (G3.67); The herb cannabis also known as marijuana has many medicinal benefits and is the most significant source of THC but some foods also have some cannabinoid content. The topic of food sources of cannabinoids and risks and safe use warnings are discussed in the section *I. Addiction or Starvation?*. Medicinal benefits are discussed in detail in the textbook *Endocannabinoids: The Brain and Body's Marijuana and Beyond*, editor and Chapter Three by Emmanuel S. Onaivi, et al., (CRC Press, 2006, Boca Raton, FL), which is available online as a pdf: ([I.Endocannabinoids: Full Text pdf](#))

G3.6.1.6: Formaldehyde & Oxidative Stress

G3.6.1.6.1: Formaldehyde: Health risks, and Environmental and Dietary sources.

Formaldehyde is a chemical that can be produced within the body as part of metabolism, it is toxic however and the body would continue to break it down further for removal from the body in conditions of normal health. Formaldehyde is found in the environment from a variety of sources and is produced in the body or in food products as a metabolite (a chemical produced from the digestion/metabolism of a larger chemical) of some alternative sweeteners (G.48) and other dietary sources including fruit juices and artificial and natural flavorings. ((G.49, (p476, G.50)) (G.56) "**Formalin**" is chemically very similar and may cause similar health symptoms. (G.42) (G.25) Formalin is used to induce pain in lab animals for experimental purposes and it was determined that the pain was due to activation of the TRPA1 channels. (G.86)

G3.6.1.6.2: Environmental and dietary sources of formaldehyde include, (G.56):

1. First and second hand smoke, (G.44); The formaldehyde content of some types of E-Cigarette preparations used for “vaping” instead of smoking the volatile gases have been found to vary significantly. Skipping to the last point on this list may provide the explanation - fruit flavoring based on fruit juice and essential oils from fruit and other artificial “*flavorings*” are frequently chemicals from a group of chemicals called *aldehydes*. They can break down over time into smaller chemicals which can include formaldehyde or other toxic types of aldehydes. (G.49) So if you are “*vaping*” in order to avoid toxins in cigarette smoke then it may be advisable to skip the “*chocolate or fruit flavoring*” and use an E-Cigarette product that just has the natural tobacco flavor instead. (Yes, tobacco is an herb and it has a flavor and nicotine can have some health benefits, however formaldehyde does not. The nicotine patch provides a steady dose of nicotine without any volatile toxins.)

2. Poorly ventilated air or smog; (G.45)
3. Vinyl and PVC plastic products off-gas formaldehyde and other volatile chemicals at levels that can make a sensitive person feel ill. (G.45). A poorly ventilated room would increase the risk of the gases accumulating to more toxic levels. The wax refinishing treatments used to clean and shine vinyl flooring are also sources of formaldehyde and other toxic gases. One re-waxing session can produce as much volatile chemicals from the chemical products that are used to strip off the old layer of wax polish and add a new layer, as the vinyl floor itself would off-gas throughout all the years of its installation. So making a choice about which type of flooring to install is also making a choice about the type of cleaning products that will be needed to maintain the floor. (G.46) A *Cleaning Product Fact Sheet* is available from the California Environmental Protection Agency Air Resources Board: (G.47). Types of flooring and other building materials are discussed in extensive detail in a review article regarding sources of *Formaldehyde in the Indoor Environment*: (G.45).
4. Metabolites of the breakdown of the alternative sweetener aspartame and Neotame include menthol and formaldehyde. (G.48)
5. Older packages of fruit juice also may contain formaldehyde in amounts that can continue to increase as the product ages. The formaldehyde is produced as other chemicals become unstable over time and metabolically breakdown into a variety of smaller chemicals which include formaldehyde. The food preservative method of ionizing radiation has been found to increase the chemical breakdown of larger aldehydes in apple juice into formaldehyde and other chemicals with toxic properties. (p476, G.50)
6. Before leaving the topic of formaldehyde, the symptoms of toxicity with workplace exposure to formaldehyde have been reported to include allergic type symptoms including: "*sneezing/airways-related symptoms, itching and watery eyes.*" (G.51) Formaldehyde exposure may also be a cause of *systemic allergic contact dermatitis*, (G.52, G.53, G.54), possibly even with symptoms of rash occurring on the eyelids.(G.55) A diet designed to avoid formaldehyde intake may be helpful for alleviating the eczema like rash. (G.52)

A summary, in reverse order;

Formaldehyde might be accumulating from several sources, (G.56):

- Workplace exposure; Workers more at risk might include health professionals, (G.51); and hair stylists or nail salon technicians, (G.58); and funeral directors may be more at risk for developing the paralyzing chronic disease ALS, (G.59); some industries such as the garment and textile industry may have formaldehyde exposure, (G.63);

- Aseptically packaged juices, the amount may collect in older packages as the product ages, ionizing radiation methods of food preservation have been found to increase the amount of toxic aldehydes including formaldehyde and therefore is not a recommended technique for the juice industry, (p476, G.50);
- Nutrasweet (aspartame) and Neotame, alternative sweeteners. (G.48)
- Vinyl flooring, cleaning products, and other PVC type of plastic products. (G.45, G.46, G.47);
- Poorly ventilated air or smog. (G.45); *Note, lighting large numbers of decorative candles may be increasing volatile chemicals in your air supply. Also air fresheners and cleaning products may contain chemicals that break down into formaldehyde. (G.60) Lifestyle choices besides smoking cigarettes can negatively affect health. Try a fern for air freshening instead; give it a nickname and you might get some emotional benefits in addition to other physical health benefits. Plants can be useful household decorations because some types can clean the air of formaldehyde and other toxins. The original research was by a NASA scientist for use in keeping the air fresh in living environments for astronauts. For the most effective air cleaning ability, the plant does need to be watered and misted as its particular type requires, because the chemical removal of formaldehyde from the air is dependent on the roots and leaves access to water. (G.61); a mechanical problem with the furnace or water heater and ventilation system may be leaking toxic chemicals into the building's air supply; increased efficiency of insulation and other building materials have created rooms and buildings that are too good at preventing air circulation, which makes maintenance and cleaning of ventilation systems and fans important - otherwise everyone working or living in the space might start feeling some symptoms of "*sick building syndrome*." (G.62)
- Smoking cigarettes or other products, and flavorings in "vaped" E-Cigarettes may also be a source of formaldehyde. (G.44, G.49)

G3.6.1.6.3: Health Risks & Fact Sheets regarding Formaldehyde, Environmental Safety and Health:

- The Centers for Disease Control provides a fact sheet for further guidance regarding risks and precautions regarding formaldehyde: *What You Should Know About Formaldehyde*, (G.57)
- The Environmental Protection Agency provides a fact sheet on sick building syndrome: *Fact Sheet: Sick Building Syndrome*, (G.62)
- The *Cleaning Products Fact Sheet*, by the California Environmental Protection Agency's Air Resources Board provides guidance regarding safer cleaning products: (G.47)
- The National Cancer Institute's *Fact Sheet: Formaldehyde and Cancer Risk* includes research on occupations that may be at risk for formaldehyde exposure and provides a list of organizations that might have more information or other help to offer. (G.63)

Sick Building Syndrome: Symptoms that may occur due to breathing air that contains too much formaldehyde may include sore throat, cough, scratchy eyes, and nosebleeds according to the fact sheet by the Centers for Disease Control. (G.57) So if everyone working in a building, or many workers or family members are all experiencing allergies or a slight cold that just doesn't seem to want to go away - then bad air may be a problem. See the fact sheet on *Sick Building Syndrome* by the EPA for more information. (G.62)

Eczema: The eczema symptoms reported in medical research may occur with more chronic long-term exposure to formaldehyde and/or in individuals who also have more difficulties metabolically with detoxifying formaldehyde - we don't know all the answers. I have personally experienced skin rashes off and on all my life and was startled to develop it on my eyelids in my more recent past - and then was more startled, or more relieved to learn of the possible cause - formaldehyde exposure (G.55) and *systemic allergic contact dermatitis*, (G.52, G.53, G.54) Poor air quality was a problem at the time in part due to water heater mechanical problems, and also first and secondhand smoke were contaminants in my air supply - I cleaned up and changed habits somewhat and my eyelid rash got better - yeah science! To me that seems like an example of *effective self care* and effective use of *evidence-based medical research* even if I had to read it on my own.

Other health risks include cancer and neurological conditions: The link between cancer and formaldehyde may be less strong than for neurological disorders such as ALS in funeral home directors, (G.59), or autism in a child whose mother had prenatal exposure to formaldehyde, (G.56), however research has found some cancers associated with occupational exposure to formaldehyde. The National Cancer Institute also has a fact sheet on the topic of formaldehyde and it includes a convenient list of addresses and websites for organizations that might have more information for workers concerned about exposure risks such as OSHA, the Occupational Safety and Health Administration,. (G.64) See the National Cancer Institute's *Fact Sheet: Formaldehyde and Cancer Risk* for more information and resources regarding formaldehyde and occupational safety: (G.63)

G3.6.1.6.4: Houseplants can help offices as well as astronauts:

If you are looking for a hair salon that is likely to have less formaldehyde and other volatile toxins in the air then look for one with lots of healthy ferns and other tropical low light houseplants. (G.61) If you are a hair salon or other business owner interested in improving the air quality in your establishment with the help of ferns and other houseplants, then hire a staff member who knows and loves plants because they do require some consistent care that can vary quite a bit depending on the type of plant - or

buy the book by the NASA research scientist and have an employee learn how to care for your indoor air-cleaning garden.

The scientist, B. C. Wolverton, organized what he learned to help astronauts in an easy to use plant guide that lists the species of plants which were found most effective at cleaning air. The book, *How to Grow Fresh Air: 50 Houseplants that Purify Your Home or Office*, includes guidance for caring for each species and also lists them by the types of volatile chemicals that they were able to remove from the air. (G.66)

Large urban areas may have office plant services available where a greenhouse or florist shop supplies and maintains lovely office plants for a subscription or rental type of payment. An employee of the plant business has a route of subscribing businesses to visit each week in order to water, mist, and trim plants of any dead leaves, even a healthy plant will look sad if it is covered in a layer of dust and has a few dead leaves. Plants that are sick are simply returned to the greenhouse for care or recycling and the empty spot is filled with a replacement by the plant business employee.

Ambius is an example of an office-plant company with service locations available in many urban areas in both Canada and the United States. See the Ambius website for more information and service locations: Ambius.com.

I'm convinced, but I also already own the book; *To do list*: Buy a new fern to replace the one from years ago that is no longer around.

Ferns, in particular, do need a certain humidity level and require misting in addition to being watered instead of being over watered whenever the fronds look dry. A room environment comfortable for humans is not the rain forest or a temperate zone. The tips of the fern leaves will turn brown even though the plant has water in its pot. The fern and other plants able to detoxify volatile chemicals from the air require moist leaves and roots in order to be able to do so. Watering a fern about once a week and misting it with water thoroughly at the same time may be sufficient, or it may prefer to be misted again occasionally in between needing water added to the soil. Over watering a plant in a container can be bad for the root structure and lead to the plant dying from being unable to take up nutrients through the damaged roots.

- The book by B. C. Wolverton includes care instructions for the species that are listed in the book *How to Grow Fresh Air: 50 Houseplants that Purify Your Home or Office*. (G.66)

G3.6.1.7: TRPV channels - the comfort of vanilla, the heat of capsaicin.

Before leaving the topic of “*getting to know your TRP channels*,” I’d like to introduce the vanilloid family. They were among the first TRP channels to be identified with lab techniques. This is all very tiny stuff, difficult to work with compared to a craft or construction project in the full size world we can see without a microscope. It is easy, however, to see when someone is scratching or wincing from pain, so the lab

technicians and research scientists are to be commended for their fine eye for microscopic detail.

Vanillin or vanilloid receptors can have a calming effect on the body - baked goods with vanilla have a little extra besides love soothing the body. However some types of TRPV channels can also be stimulated by hot pepper due to its capsaicin content. (G3.99) Capsaicin is the active phytochemical that causes a feeling of “*hot*” when hot peppers are eaten - because it activated a TRPV channel which activates a nerve to send a signal to the brain that is most likely to be interpreted as “*hot*” although some people learn to enjoy the feeling, or may be genetically different and experiencing slightly differently than other people who couldn’t imagine eating very hot, hot peppers (G3.100)

The aroma of vanilla can lead to an emotional feeling of comfort even without eating a food containing the phytochemical that can activate the TRPV channels. “*Aroma*” does involve nerves being activated in response to a chemical in the air that enters the nostrils. Tiny amounts of “*vanilla*” aroma are entering the nose and physically activating TRPV channels which physically activate nerve signals that tell the brain “*something*” happened. This time it wouldn’t be as obviously “*hot*” as the capsaicin though, the vanilla is activating a different TRP channel which would activate a different nerve. If hot peppers had been experienced before the memory of them would be strong enough to remember not to eat them or touch them again. Making “*noxious*” chemicals, irritants or toxins, is a plant defense mechanism to encourage animals to not eat the plant unless it is ready for the seeds to be spread. A delicious fruit smells delicious when it is ripe and the seeds are ready to be “*planted*” somewhere other than right where the plant is growing. Some plants make seed pods that catch the wind or have burrs and attach to animal fur as animals walk by, and other plants make delicious fruit or other nutritious seeds to encourage animals to eat them, and carry the seeds elsewhere to be “*planted*” later (whenever the animal defecates). Nature is amazing.

Vanilla is a delicious smelling seed pod so the plant must want its seeds to be eaten. For delicious history and recipe information see *Primer: Vanilla Part One and Two*, by Jasmine, a culinary blogger. (G3.102, G3.103)

We learn from previous experiences when to avoid something and when to reach for a second helping. If the brain had experienced home baked cookies in the past, then the scent of them baking any time in the future might set off an expectation of delicious food and activate saliva glands in addition to causing a calm or pleasant emotional response to the aroma of vanilla or a comforting memory from childhood. Aromas can also be tied to emotional responses that were learned in childhood or at any time in a trauma situation. Positive memories associated with an aroma may be triggered by re-experiencing the favorite fragrance or negative memories might also be triggered by a reminder of something associated with the trauma.

See the [Effectivecare.info Google docs](https://www.effectivecare.info/google-docs) for the list of G3 References

G3.6.2 - new section - EMF/WiFi electrical fields and TRP channel activation

TRP channels had not been thought to be voltage gated like other types such as voltage gated Calcium channels but some may be. Particularly some types of intracellular TRP channels, which have been found to respond to pre-excitation by small voltage changes which can then make them more likely to be activated by other stimuli. The intracellular TRP channels can then release calcium which can lead to multiple other intracellular reactions.

- See: Nilius B, Talavera K, Owsianik G, Prenen J, Droogmans G, Voets T. *Gating of TRP channels: a voltage connection?*. J Physiol. 2005;567(Pt 1):35-44. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1474154/>

Extremely low frequency electro-magnetic fields (ELF-EMFs) have been found to upregulate TRPC-1 channels and promote neuronal differentiation and neurite outgrowth of embryonic neural stem cells. Intracellular calcium levels also increased.

- See: Ma Q, Chen C, Deng P, et al. *Extremely Low-Frequency Electromagnetic Fields Promote In Vitro Neuronal Differentiation and Neurite Outgrowth of Embryonic Neural Stem Cells via Up-Regulating TRPC1*. PLoS One. 2016;11(3):e0150923. Published 2016 Mar 7. doi:10.1371/journal.pone.0150923 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4780708/>

If small amounts of microwave type or other electromagnetic field exposure can promote some types of cell growth, may larger amounts cause other more negative effects or symptoms, or promote cancerous cell growth? Potentially yes according to Martin L. Pall, a biochemist who has studied the issue intensively, a topic that includes “20,000 papers on microwave biological effects.”

Safety standards regarding microwave and other EMF electrical fields such as wireless internet or cell phone tower signals are based on whether there is a heating effect and the electrical field is considered safe if it does not cause significant heating of cells or other matter - as is caused within a microwave oven. However the 20000 papers includes “4000 studies on therapeutic effects of microwave EMFs, effects that are well known to be nonthermal (6).” Intracellular calcium signalling controls many metabolic pathways within the cell and is generally kept within careful control during healthy bodily function.

- Health risks or benefits of electro-magnetic field exposure (EMF) depending on the amount or type may include: “oxidative stress; single and double stranded breaks in cellular DNA; therapeutic effects; blood-brain barrier breakdown; greatly depressed melatonin levels and sleep disruption; cancer; male and

female infertility; immune dysfunction; neurological dysfunction; cardiac dysfunction including tachycardia, arrhythmia and sudden cardiac death,” - M. L. Pall.

- Further discussion of possible risks, mechanism, and proposed revision of safety standards is available here: Martin L. Pall, *Microwave Electromagnetic Fields Act by Activating Voltage-Gated Calcium Channels: Why the Current International Safety Standards Do Not Predict Biological Hazard*, <https://ecfsapi.fcc.gov/file/7521102473.pdf>

Returning to one of the chronic conditions discussed earlier, oxidative stress can be a cause of chronic itch (pruritus) due to some of the free radical chemicals that are produced causing activation of TRPA1 channels.

- Zhou FM, Cheng RX, Wang S, et al. *Antioxidants Attenuate Acute and Chronic Itch: Peripheral and Central Mechanisms of Oxidative Stress in Pruritus*. *Neurosci Bull.* 2016;33(4):423-435. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5567556/>



So if it seems to you that holding your laptop on your lap to work causes you to be itchy, or have other inflammatory swelling type reactions on your legs, then you may be right. From my own experimentation for symptom relief, I found that a pillow or other layers of fabric items reduced heat buildup somewhat but didn't resolve the

symptoms of itch and swelling/vascular pain. Placing a large wooden cutting board between the laptop and my lap did help however.



Wood does not block all EMF electrical radiation but it can reduce the amount that reaches you. See: *Does Wood Block EMF Radiation?*, [The EMF Academy](#).

If something seems physically wrong - there may be a reason and it may be possible to change the situation.

See a healthcare provider for medical advice, diagnosis or treatment.

- *Disclaimer: Opinions are my own and the information is provided for educational purposes within the guidelines of fair use. While I am a Registered Dietitian this information is not intended to provide individual health guidance. Please see a health professional for individual health care purposes.*
- The Academy of Nutrition and Dietetics has a service for locating a nutrition counselor near you at the website eatright.org: (eatright.org/find-an-expert)

8.9: Links and References

1. Lisa Firestone, Ph.D. *How Your Attachment Style Impacts Your Relationship*, (July 30, 2013): <https://www.psychologytoday.com/blog/compassion-matters/201307/how-your-attachment-style-impacts-your-relationship> (8.1)
2. Marcel Paulssen, *Attachment Styles in Business to Business Relationships*, Humboldt-University of Berlin, Germany <https://impgroup.org/uploads/papers/5774.pdf> (8.2)
3. Marsha Linehan, PhD, *Dialectical Behavior Therapy (DBT) for Borderline Personality Disorder*, an excerpt from a 32 page article published by the author online with permission from The Journal of the NAMI California. The full article: "Borderline Personality Disorder." (Volume 8, Issue 1) http://dbtselfhelp.com/html/linehan_dbt.html (8.3)
4. Linda Dimeff and Marsha Linehan, PhD, *Dialectical Behavior Therapy in a Nutshell*, The California Psychologist, 34, 10-13, 2001 <http://dbtselfhelp.com/DBTinaNutshell.pdf> (8.4)
5. Matthew McKay, Ph.D, Jeffrey C. Wood, Psy. D, and Jeffrey Brantley, MD, *The Dialectical Behavior Therapy Skills Workbook: Practical DBT Exercises for Learning Mindfulness, Interpersonal Effectiveness, Emotion Regulation & Distress Tolerance*, (New Harbinger Publications, Inc., 2007, Oakland, CA). <https://www.newharbinger.com/dialectical-behavior-therapy-skills-workbook> (8.5)
6. R. Chris Fraley, *A Brief Overview of Adult Attachment Theory and Research*, University of Illinois, <https://internal.psychology.illinois.edu/~rcfraley/attachment.htm> (8.6)
7. *Stress Relief from Laughter? It's No Joke.*, Mayo Clinic <http://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/stress-relief/art-20044456> (8.7)
8. Christina Pazzanese, *Go Ahead, Be Sarcastic*. Harvard Gazette (July 24, 2015) <http://news.harvard.edu/gazette/story/2015/07/go-ahead-be-sarcastic/> (8.8)
9. Roger Dooley, *Why Faking a Smile is a Good Thing*, Forbes (Feb. 26, 2013) <https://www.forbes.com/sites/rogerdooley/2013/02/26/fake-smile/#1facdd583676> (8.9)
10. *Cognitive Reframing*, <http://www.ryananswers.com/cognitive-reframing/> (8.10)
11. *Psychotherapy*, John Bowlby, - video, <https://www.youtube.com/watch?v=3LM0nE81mIE> (8.11)
12. Adam Grant, *To Be Resilient, Don't Be Too Virtuous; I want to tell you what I think is missing from most graduation speeches*. May 12, 2017, <https://www.thriveglobal.com/stories/908-to-be-resilient-don-t-be-too-virtuous> (8.12)

13. Michael PI Leiter, Arla Day, and Lisa Price, *Attachment styles at work: Measurement, collegial relationships, and burnout*, Burnout Research, Vol. 2, Issue 1, March 2015, pp 25-35, <http://www.sciencedirect.com/science/article/pii/S2213058614200052> (8.13)
14. Susan M. Johnson, *Attachment Theory; A Guide for Couple Therapy*. 2003, <http://chicagoeft.com/wp-content/uploads/2012/06/Attachment-Theory.pdf> (8.14)
15. *Adolescent-parent attachment: Bonds that support healthy development*, PaediatrChildHealth. 2004, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2724162/> (8.15)
16. *Sonobuoy*, en.wikipedia.org, (8.16. *Sonobuoy*)
17. United States Court of Federal Claims No. 92-580 C (Filed Under Seal: August 26, 2009), *Sparton Corporation versus U.S. Government*, <http://www.cofc.uscourts.gov/sites/default/files/opinions/DAMICH.SPARTON091009.pdf> (8.17. [cofc.uscourts.gov](http://www.cofc.uscourts.gov))
18. Inventors: Donald R. Depew, Robert A. Houghton, David D. Sparks, *Patent: Tapered wiring harness CA 1260323 A*, Applicants: Donald R. Depew, Robert A. Houghton, David D. Sparks, Sparton Corporation, Sept. 26, 1989 https://encrypted.google.com/patents/CA1260323A?hl=en&output=html_text (8.18. [patents/CA1260323A](https://encrypted.google.com/patents/CA1260323A))
19. Synopsis of the book *Cheaper by the Dozen*, by Frank B. Gilbreth, Ernestine Gilbreth Carey, for a lesson plan NCSC Wiki, *Unit 1 MS Adapted Text*. https://wiki.ncscpartners.org/images/5/5d/Unit_1_MS_Adapted_Text.pdf (8.19)
20. *Home Page*, National Center and State Collaborative (NCSC), NCSC Wiki, [ncscpartners.org](https://wiki.ncscpartners.org/index.php/Main_Page), https://wiki.ncscpartners.org/index.php/Main_Page (8.20)
21. Frank B. Gilbreth, Ernestine Gilbreth Carey, *Cheaper by the Dozen, First Edition*, 1963, <https://www.abebooks.com/book-search/title/cheaper-by-the-dozen/author/gilbreth/first-edition/> (8.21)
22. Anne K. Reitz, Julia Zimmermann, Roos Hutteman, Jule Specht, & Franz J. Neyer. *How Peers Make a Difference: The Role of Peer Groups and Peer Relationships in Personality Development.*, published in the 2014 Special Edition "*Personality Development*" of European Journal of Personality (8.22)
23. Kent C Berridge, J Wayne Aldridge, Kimberly R Houchard and Xiaoxi Zhuang, *Sequential super-stereotypy of an instinctive fixed action pattern in hyper-dopaminergic mutant mice: a model of obsessive compulsive disorder and Tourette's*. BMC Biology, 2005 3:4 <https://bmcbiol.biomedcentral.com/articles/10.1186/1741-7007-3-4> (8.23)
24. *Sparton Corporation and Ultra Electronics USSI Joint Venture (ERAPSCO) Awarded \$166 Million for U.S. Navy Sonobuoy Contract*, Sparton, Aug. 6, 2014, (8.24)

9.8 References

7,3, 9,1-9.3 and 9.22-9.31

- 7.3: Robert M. Sapolsky, *Behave: The Biology of Humans at Our Best and Worst*, (Penguin Press, 2017, New York) <http://www.penguinrandomhouse.com/books/311787/behave-by-robert-m-sapolsky/97815942050> (7.3)
- Marcel Paulssen, *Attachment Styles in Business to Business Relationships*, Humboldt-University of Berlin, Germany <https://impgroup.org/uploads/papers/5774.pdf> (9.1)

- Carole Khalife, *The Impact of Chronic Work Stress On Your Employees*, April 26, 2017, <https://www.entrepreneur.com/article/293336> (9.2)
- Byoung-Suk Kweon, Roger S. Ulrich, Verrick D. Walker and Louis G. Tassinary, *Anger and Stress: The Role of Landscape Posters in an Office Setting*, *Environment and Behavior* 2008 40: 355
https://www.researchgate.net/profile/Louis_Tassinary/publication/258132363_Anger_and_Stress_The_Role_of_Landscape_Posters_in_an_Office_Setting/links/0a85e5304d07b6d045000000.pdf (9.3)
- Jillian Jordan, Paul Bloom, Moshe Hoffman, David Rand, *What's the Point of Moral Outrage?* Opinion, *The New York Times*, (Feb. 26, 2016)
<https://www.nytimes.com/2016/02/28/opinion/sunday/whats-the-point-of-moral-outrage.html?smid=tw-nytopinion&smtyp=cur&r=1> (9.22)
- Eric W. Dolan, *Study: Guilt Predicts Expressions of Moral Outrage*, *PsyPost* (April 18, 2017)
<http://www.psypost.org/2017/04/study-guilt-predicts-expressions-moral-outrage-48767> (9.23)
- .Neel Burton, M.D., *The Psychology of Humiliation, What is humiliation and can it ever be justified?*,
<https://www.psychologytoday.com/blog/hide-and-seek/201408/the-psychology-humiliation> (9.24)
- Tim Radford, *Study Shows Human Sacrifice Was Less Likely in More Equal Societies*, April 4, 2016,
<https://www.theguardian.com/science/2016/apr/04/study-shows-human-sacrifice-was-less-likely-in-more-equal-societies> (9.25)
- *The Destructive Power of Shame*, *The Neurocritic*, July 13, 2013,
<http://neurocritic.blogspot.com/2013/07/the-destructive-power-of-shame.html> (9.26)
- Clare S. Allely, C. S. Allely, H. Minnis, L. Thompson, P. Wilson, C. Gilberg, *Neurodevelopmental and psychosocial risk factors in serial killers and mass murderers*, *Aggression and Violent Behavior*. Volume 19, Issue 3, May–June 2014, Pages 288-301,
<http://www.sciencedirect.com/science/article/pii/S1359178914000305> (9.27)
- Dario Alvarez, *Identity, Shame, and Humiliation: Psychosocial contributors to violence along the Tijuana-San Diego Border*. *Journal of Transborder Studies – Research and Practice* Winter 2013,
<http://www.fronterismo.org/transfronterizos/wp-content/uploads/2014/01/Identity-Shame-and-Humiliation-Dario-Alvarez3.pdf> (9.28)
- Paul Gilbert* and Sue Procter, *Compassionate Mind Training for People with High Shame and Self-Criticism: Overview and Pilot Study of a Group Therapy*., *Clin. Psychol. Psychother.* 13, 353–379 (2006) Approach
<http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=DC9DBB3EF8A516C21D8C7639EBC67741?doi=10.1.1.362.7507&rep=rep1&type=pdf> (9.29)
- E. J. Kramer, K. Kwong, E. Lee, and H. Chung, *Cultural Factors Affecting the Mental Health of Asian Americans*, *West J Med.* 2002 Sep; 176(4): 227–231.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1071736/> (9.30)
- Kevin J. Delaney, *Startups be warned: Something weird happens to companies when they hit 150 people.*, *Quartz*, qz.com, Nov.29, 2016
<https://qz.com/846530/something-weird-happens-to-companies-when-they-hit-150-people/> (9.31)